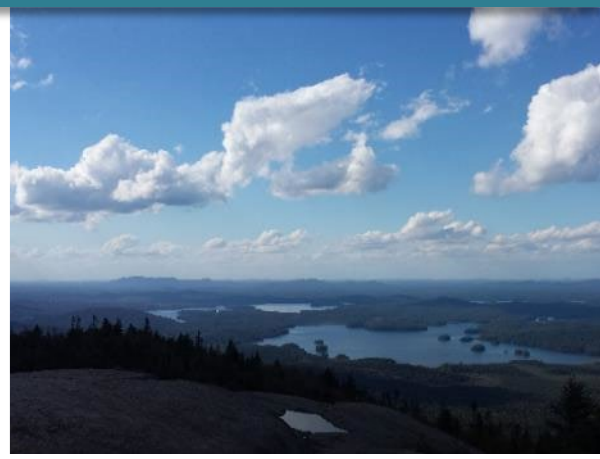
Climate Change Adaptation Planning for Tribes and Tribal Partners





Pre-workshop webinar:

Climate impacts and an introduction to adaptation

May 2019

Great Lakes Indian Fish & Wildlife Commission | 1854 Treaty Authority · Bois Forte · Grand Portage | Inter-Tribal Council of Michigan, Inc. | College of Menominee Nation, Keshena, Wisconsin | 1885 Michigan Tech | NIACS Northern Institute of Applied Climate Science | Forest Service U S Department of Agriculture

Welcome to the Pre-Workshop Webinar!

- Plan for ~ 90 minutes
- This will be recorded

Notes:

- There will be some homework to complete before we meet in person!

Workshop:

- June 3-5, starting at 9am

Robin Clark

Sara Smith

Stephen Handler

Hannah Panci

Outline

1. Climate change impacts
2. Adaptation concepts
3. Guiding principles and Tribal Adaptation Menu
4. How to prepare for the workshop

Who we are -

Core Tribal Adaptation Menu team:

- GLIFWC (Melonee Montano, Hannah Panci, Rob Croll, Kim Stone)
- 1854 Treaty Authority (Tansey Moore)
- Lac du Flambeau (Patricia Moran)
- Michigan Tech (Jerry Jondreau)
- College of Menominee Nation (Chris Caldwell, Greg Gauthier)
- Red Cliff Band (Ziigwanikwe (Katy) Bresette)
- Northeast Climate Adaptation Science Center (Sara Smith)
- Inter-Tribal Council of Michigan (Robin Clark)
- NIACS (Stephen Handler, Kristen Schmitt, Chris Swanston)

Who's on the phone?

Share your name, location, favorite May activity

Climate Change Impacts

Climate impacts

Adaptation concepts

Tribal adaptation menu

Preparing for the workshop

Climate Trends and Projections:

Fourth National Climate Assessment
nca2018.globalchange.gov/

- **National Climate Assessment -** Climate Science Special Report
  science2017.globalchange.gov

NOAA Climate at a Glance tool (data)
www.ncdc.noaa.gov/cag/

Impacts on ecosystems

Forests (NIACS)
forestadaptation.org/vulnerability-assessment

Wetlands/natural communities (WICCI)
www.wicci.wisc.edu/plants-and-natural-communities-working-group.php

Culturally Important Species (GLIFWC)
data.glifwc.org/archive.bio/GLIFWC_Climate_Change_Vulnerability_Assessment_Version1_April2018.pdf

Culturally Important Species (ITCMI)
www.itcmi.org/departments/environmental-services/

There are still a range of possible futures!

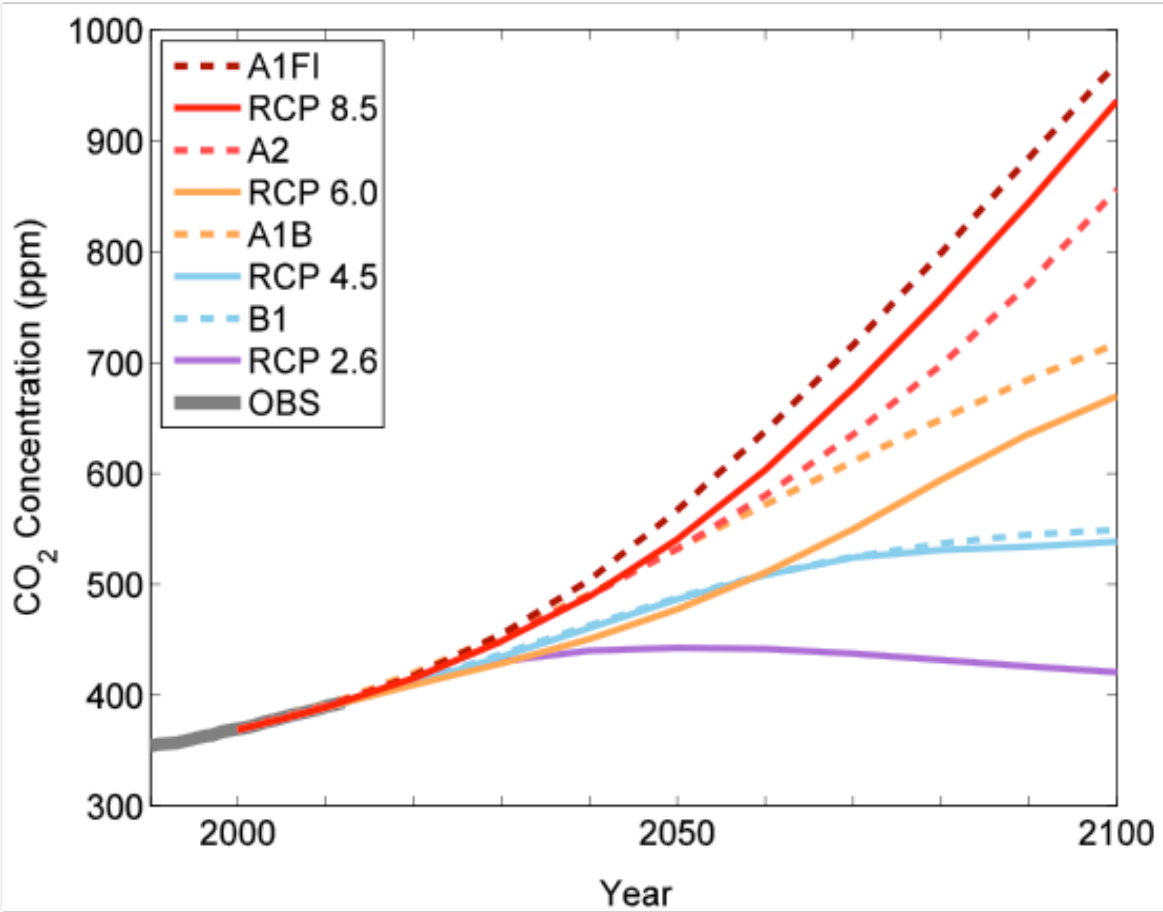
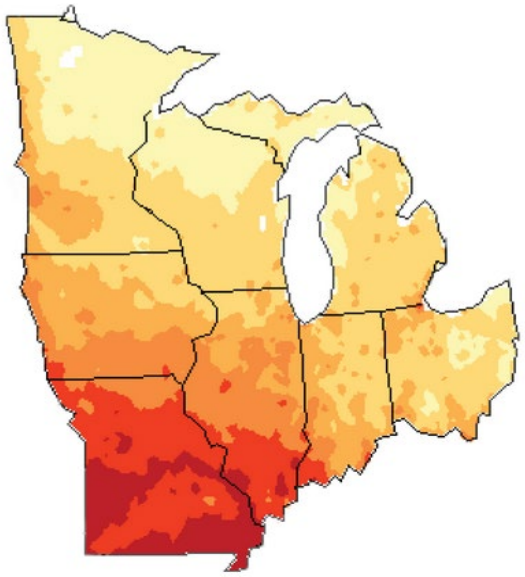


Figure Source: IPCC 2007, 2014



Eight Key Impacts …

- Longer growing season
- Less cold / more heat
- Less snow
- More rain in winter/spring
- More extreme rainfall
- More drought stress
- Shifting species
- Cumulative stressors

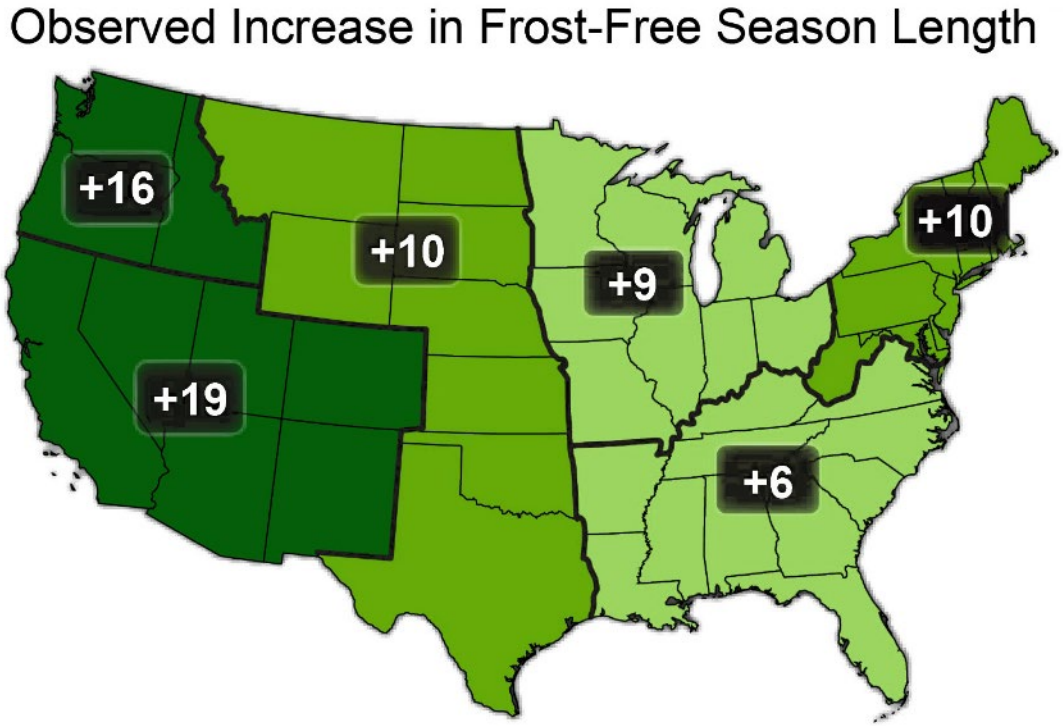
Longer Growing Seasons

The frost-free season lengthened by **16 days** in the Great Lakes region from 1951-2017

Opportunity:
Longer period for plant growth

Challenge:
Potential risks from altered seasonality

- Early bud break/loss of cold hardening
- Frost damage during spring freezing
- May advantage some invasive plants



http://glisa.umich.edu/resources/summary

Climate impacts

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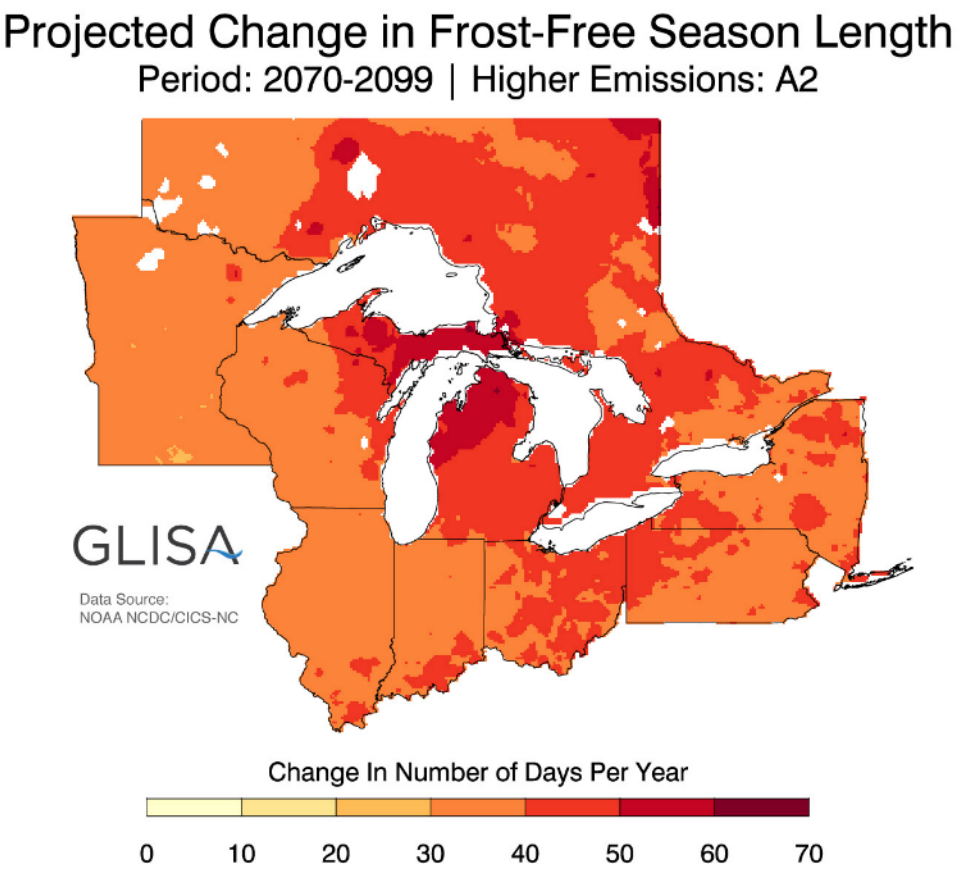
Longer Growing Seasons

May increase up to **50-70 days** by 2100 (high emissions)



Opportunity:
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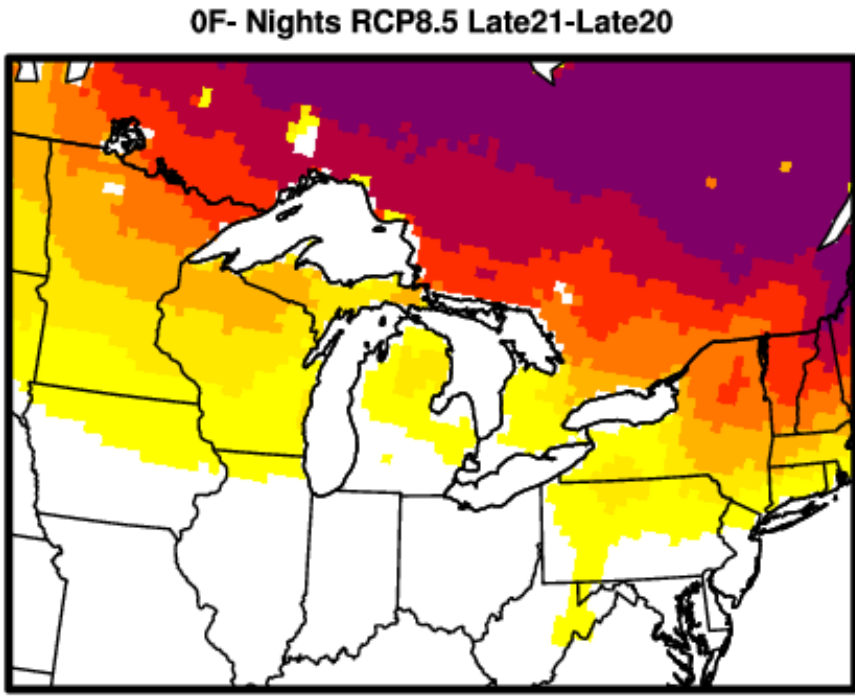
- Early bud break/loss of cold hardening
- Frost damage during spring freezing
- May advantage some invasive plants

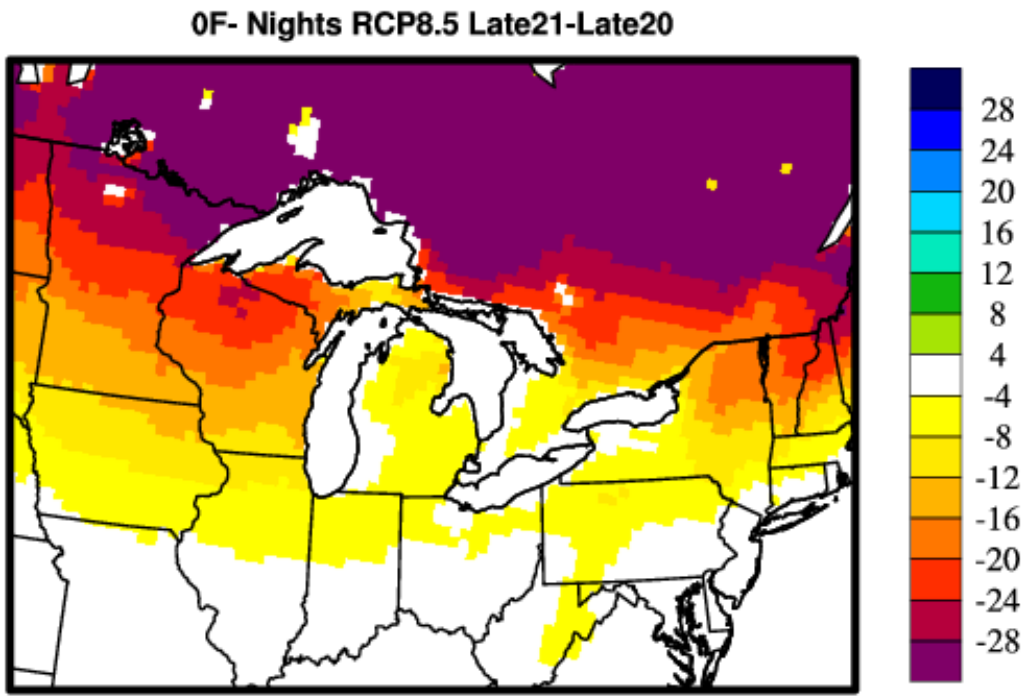
http://glisa.umich.edu/resources/great-lakes-regional-climate-change-maps

Less Extreme Cold

Decrease in **4 - 28 days** below 0°F by 2100 (high emissions)



MRI model



IPSL model

http://nelson.wisc.edu/ccr/resources/LCC/index.php

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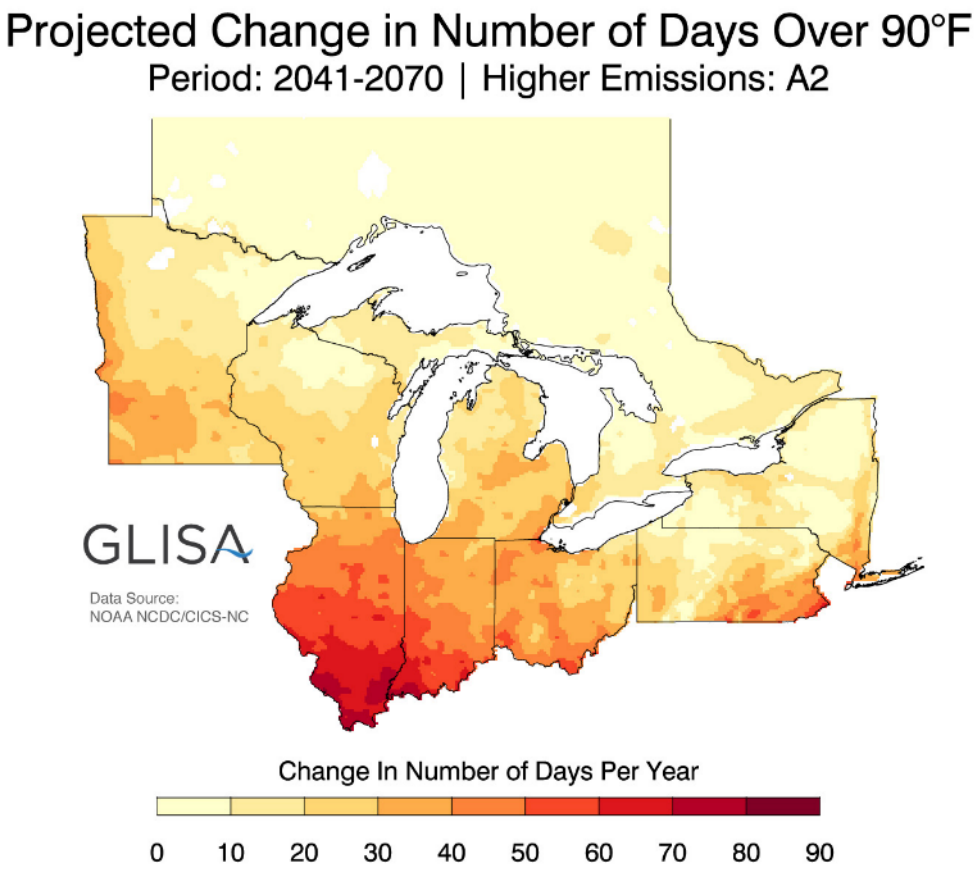
More extreme heat

Increase in **10 - 60 days** above 90°F by 2070 (high emissions)



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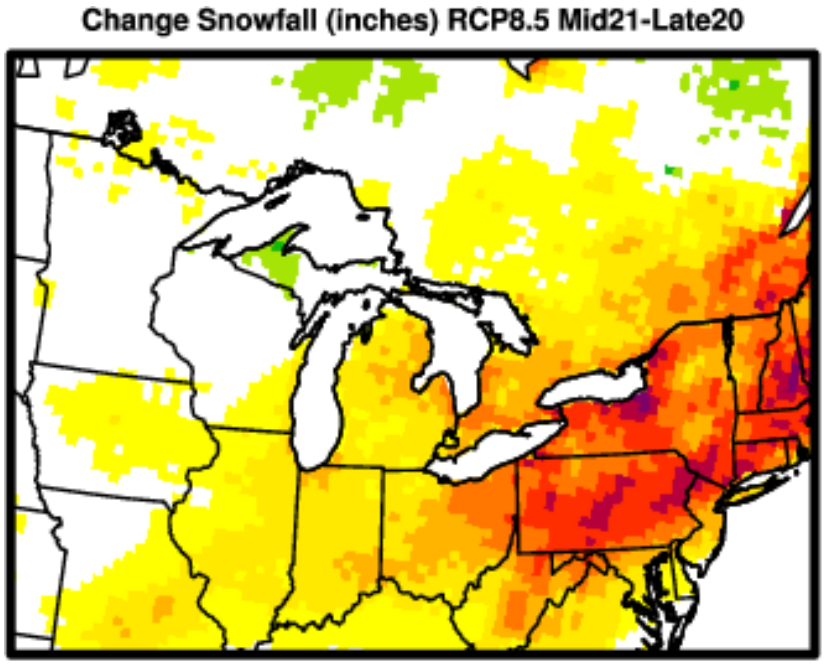
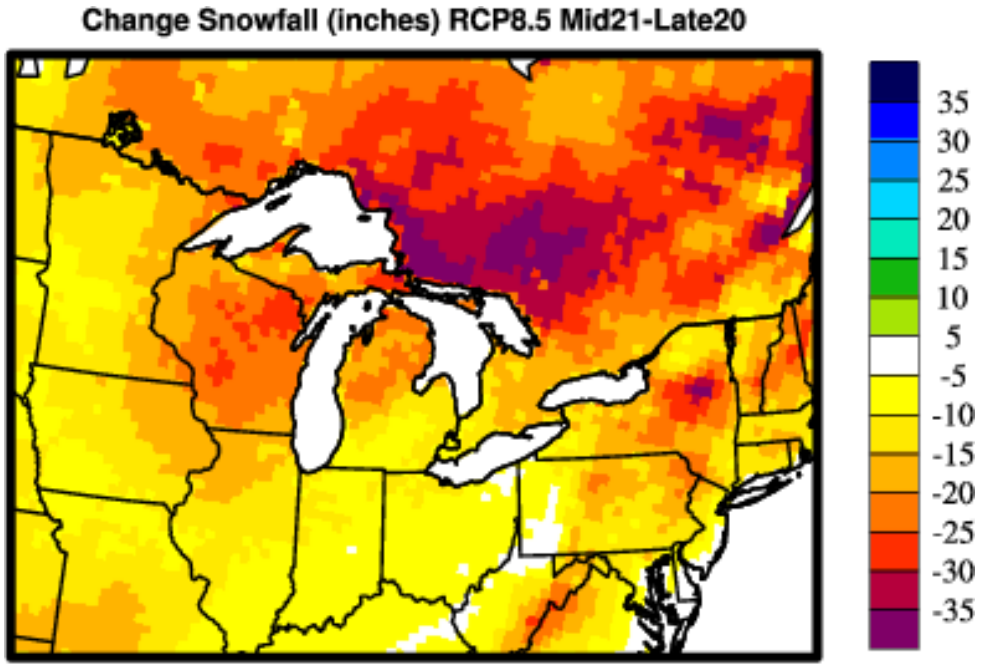
Warmer Winters = Less Snow

Also decreases in snow cover duration & depth

MRI Model



IPSL Model



Sources: Notaro et al. 2014, Notaro et al. 2015, http://ccr.aos.wisc.edu/resources/data_scripts/dyndown

Warmer Winters = Less Snow

Also decreases in snow cover duration & depth

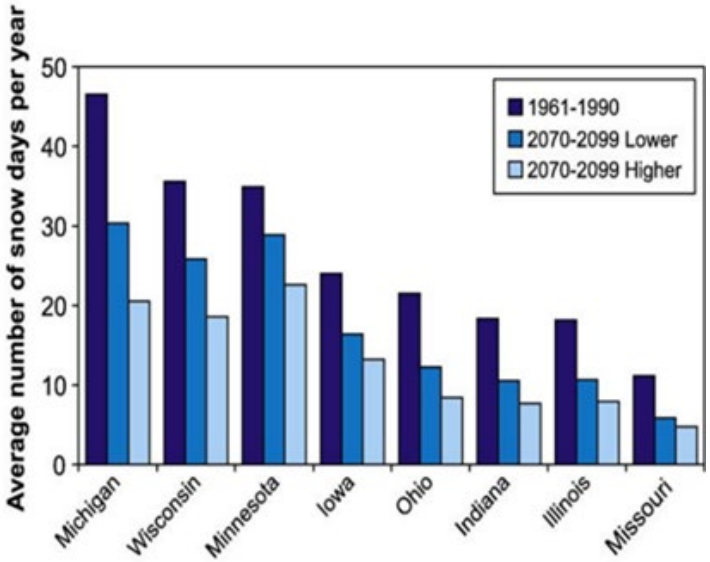
Challenge:

Decreased snowpack

- Increased soil frost and root damage in cold temps
- Warmer soil temperatures and altered processes
- Changing wildlife dynamics (e.g. deer)

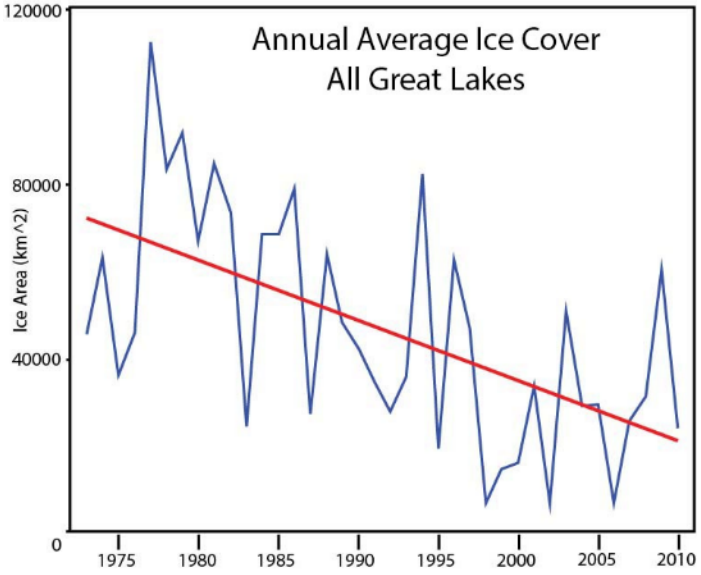
Warmer Winters = Less Snow

Decreases in snow as well as ice cover



Decreased Ice Cover

- First ice cover on inland lakes is already 6-11 days later than it used to be, along with the ice-out 2-13 days earlier
- The annual ice coverage has decreased drastically by 71% from 1973-2010



Climate impacts

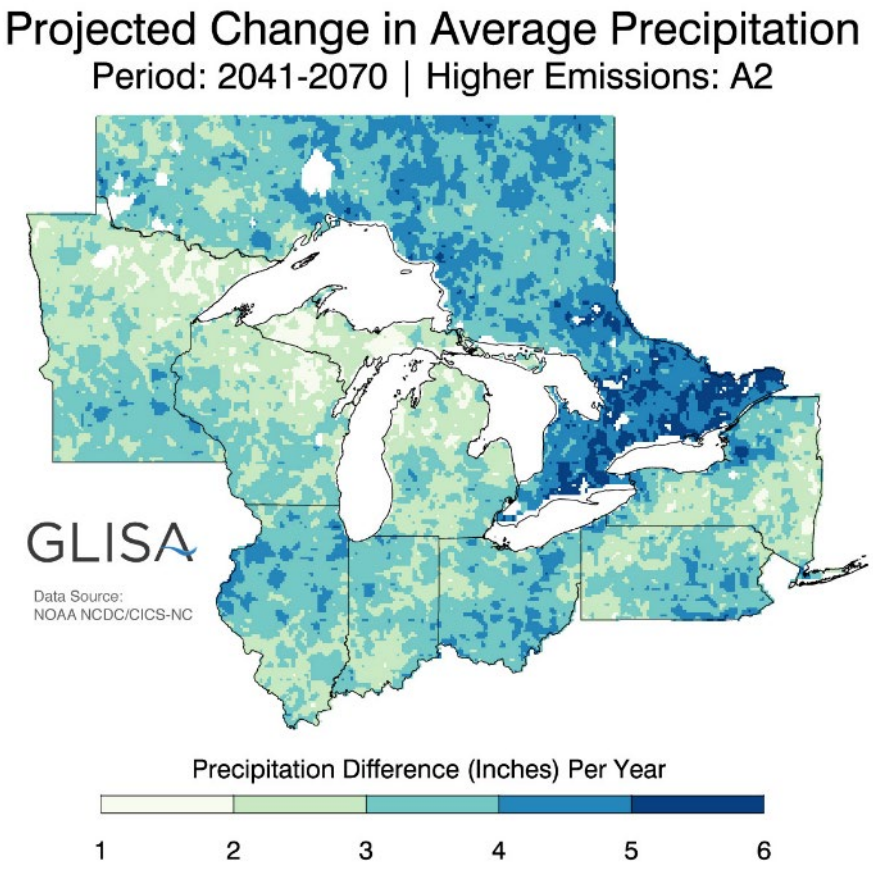
Adaptation concepts

Tribal adaptation menu

Preparing for the workshop

More rain in winter & spring

From 1951 2017 total annual precipitation has increased by 14% in the Great Lakes region.



http://glisa.umich.edu/resources/great-lakes-regional-climate-change-maps

Opportunity:

Potentially more water available for humans and ecosystems

Challenge:

- Earlier spring peak streamflows
- Potential increases in flashiness – erosion & washouts
- Potential declines in summer stream flow

Climate impacts

Adaptation concepts

Tribal adaptation menu

Preparing for the workshop

Increased extreme rainfall (and other events)

Challenge:

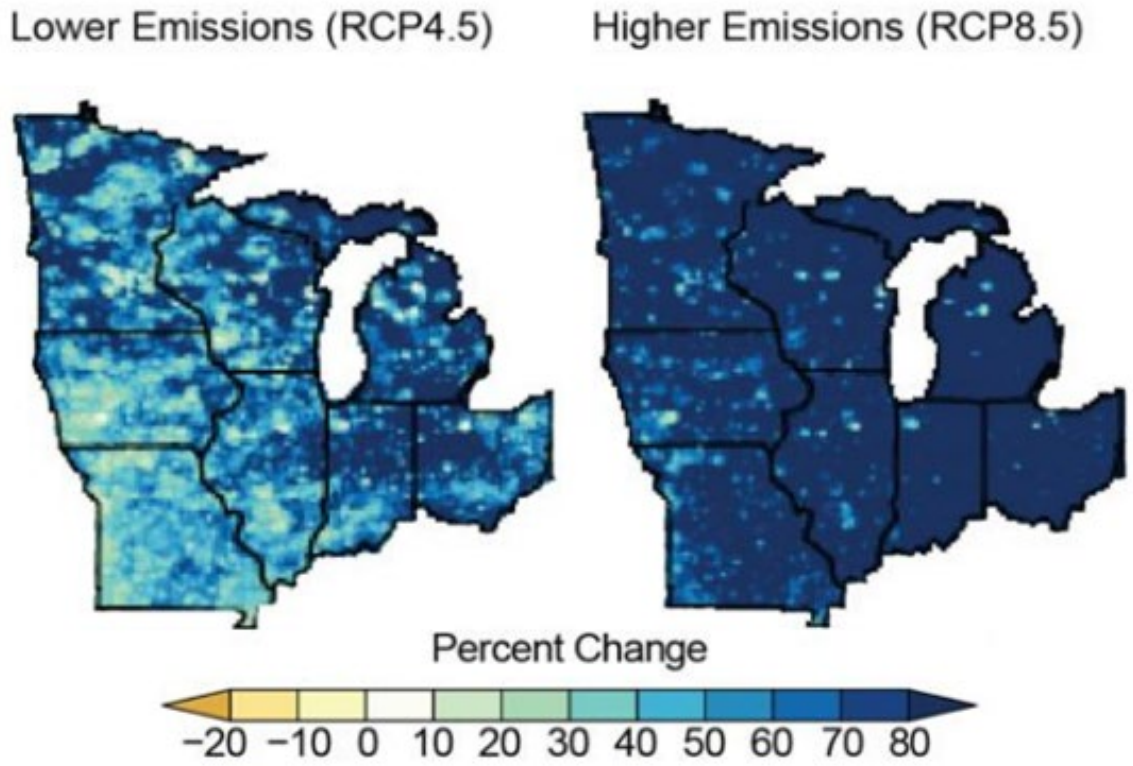
- Heavy precipitation
- Flooding
- Ice storms
- Heat waves/droughts
- Wind storms

“Events” are very difficult to predict

Photos: Linda Parker/ USFS

Increased extreme rainfall

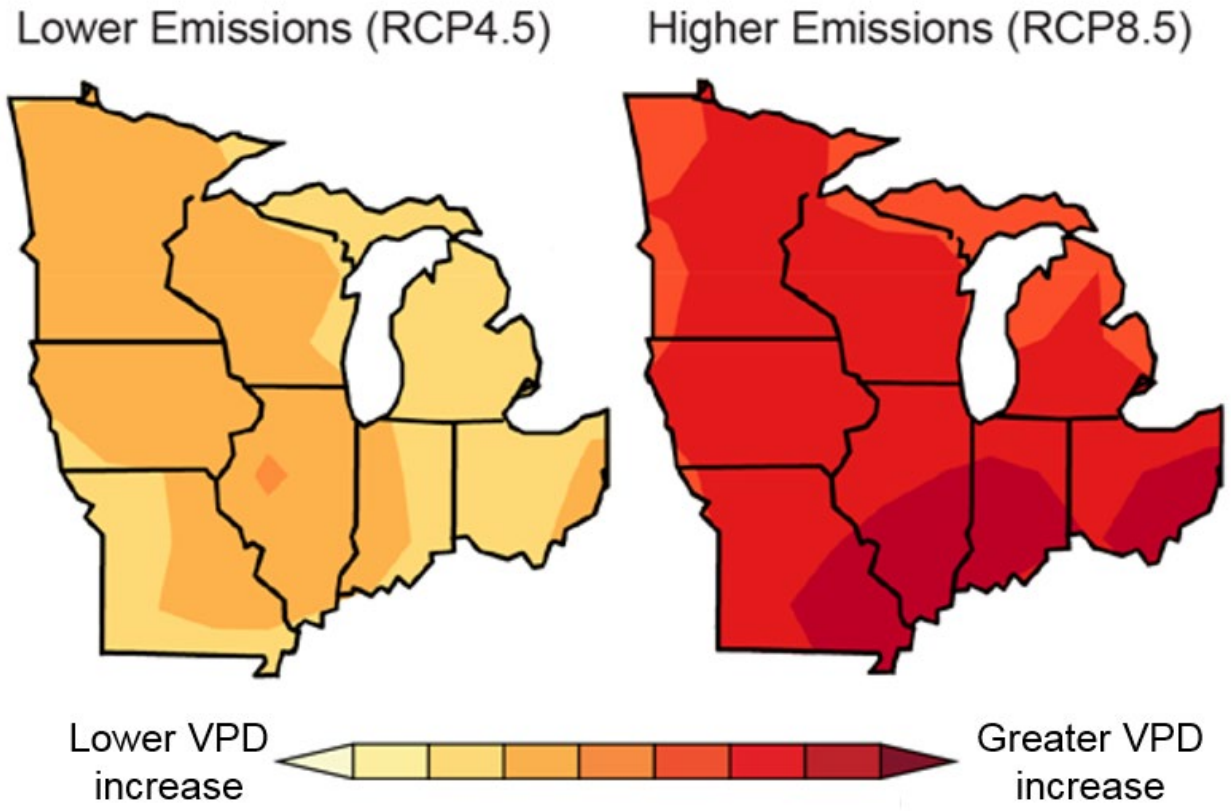
The amount of precipitation falling in the heaviest 1% of storms increased by 35% in the Great Lakes region
from 1951-2017, **30-80% more** extreme precipitation days by 2100.



Moisture Stress

Warmer temperatures = vapor pressure deficit (VPD)

- More evaporation from soils & open water
- More transpiration from plants



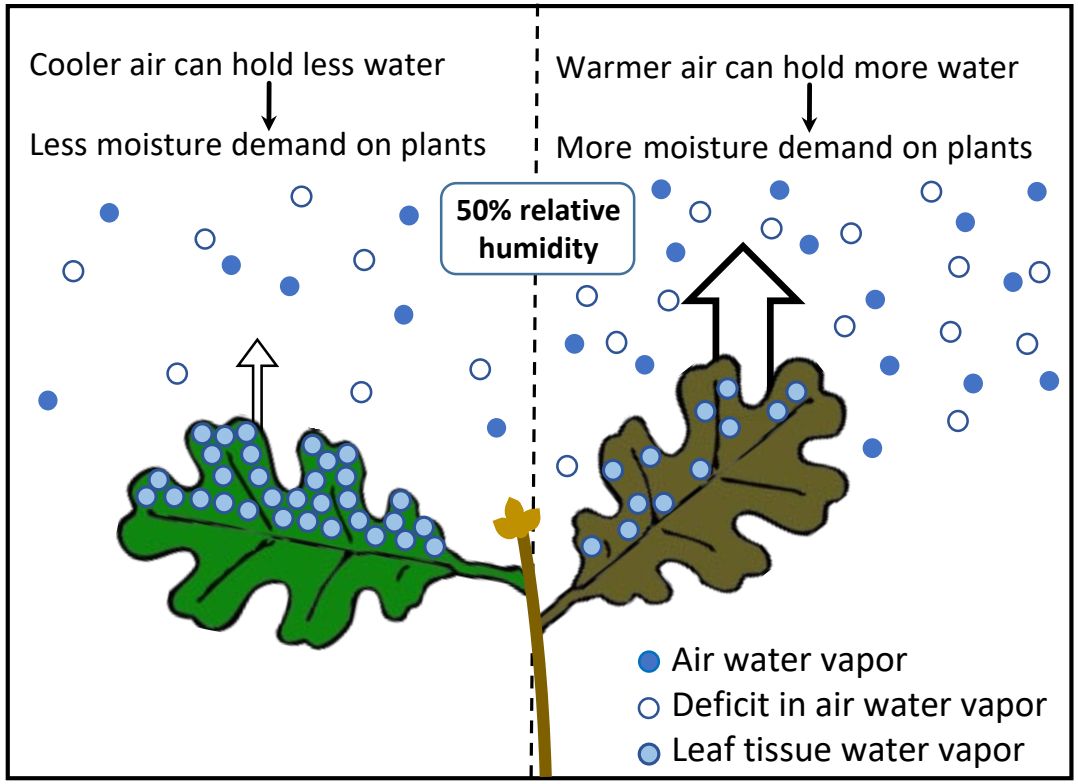
Source: NCA4 – Midwest Regional chapter: https://nca2018.globalchange.gov/chapter/21/

Moisture Stress

Warmer temperatures = vapor pressure deficit (VPD)

Challenge:

- "Feels" like a drought, even with more precip



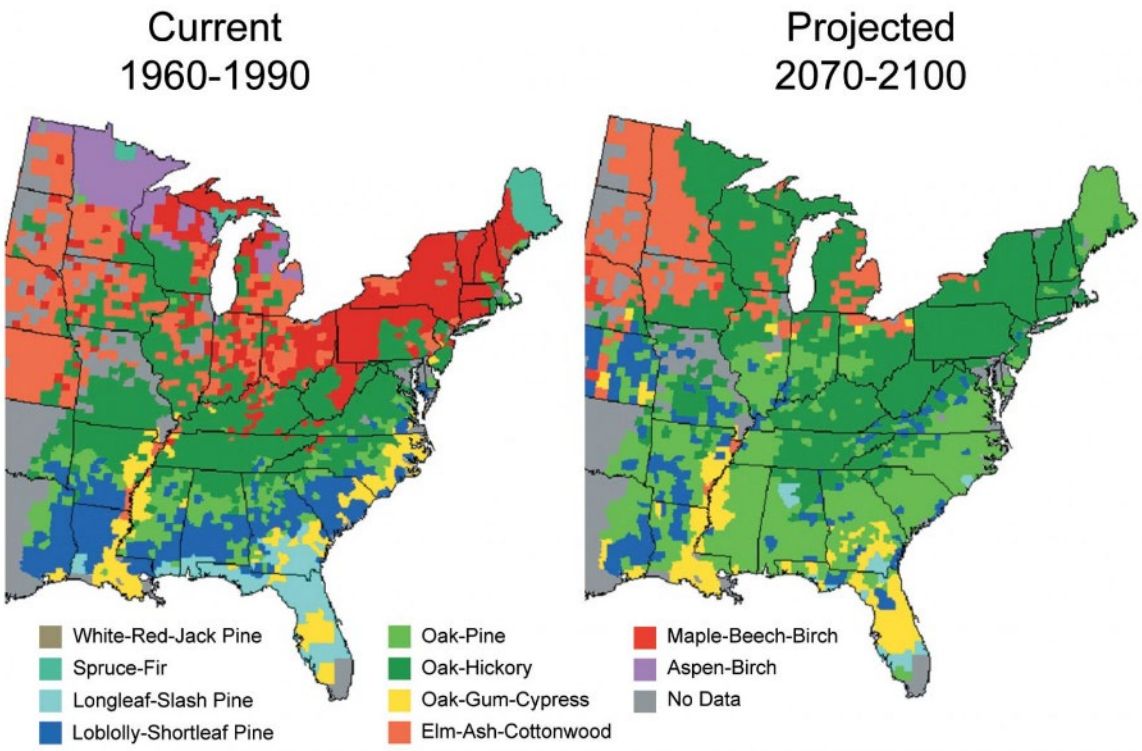
Source: NCA4 – Midwest Regional chapter: https://nca2018.globalchange.gov/chapter/21/

Species Changes

Plant and animal species will respond to changes in climate.

Opportunity: Increased habitat for some species

Challenge: Decline of northern/boreal species



Climate impacts

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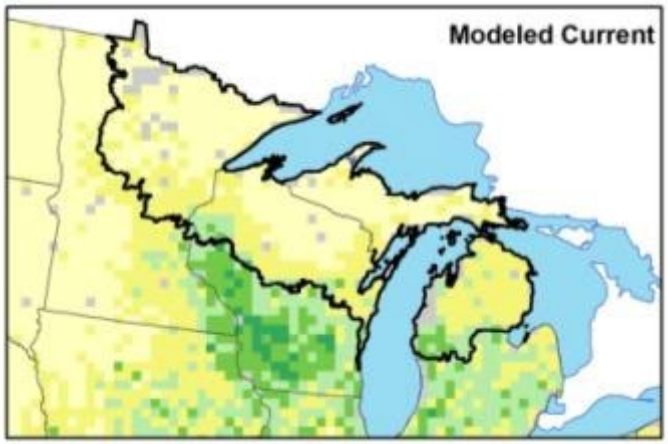
Species Changes – White oak

Importance Value

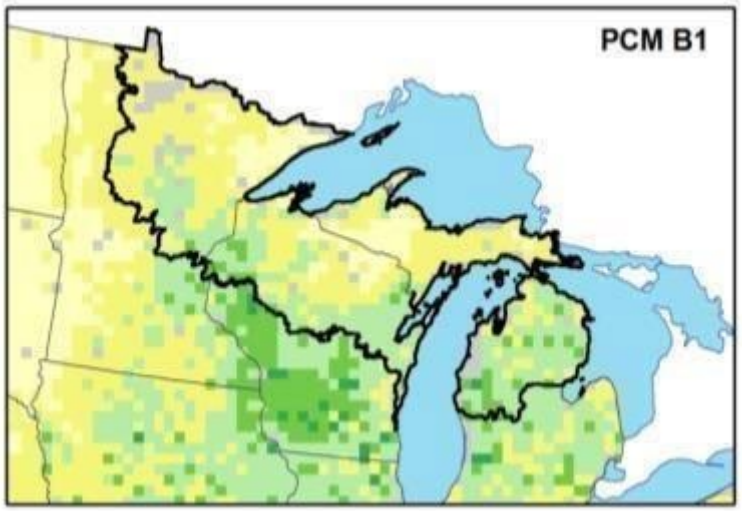
Low

High

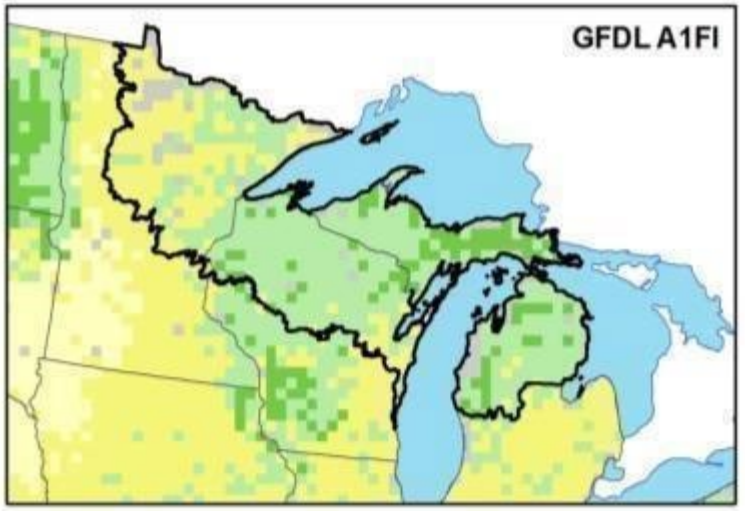
Current



2070-2100 Low

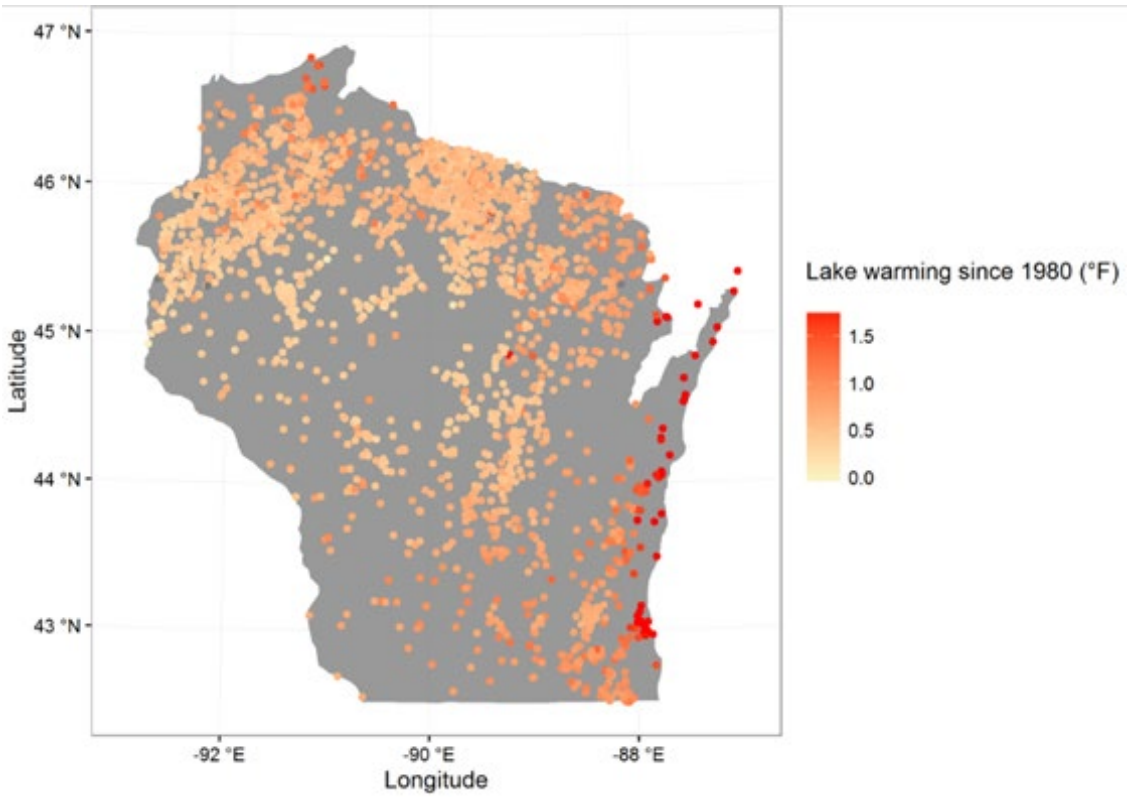


2070-2100 High



Species Changes – Aquatic Species

- Coldwater fish most likely decline and migrate north due to warming temperatures in lakes and streams
- Changes in the timing and duration of lake stratification will also impact aquatic species and create dead zones in water bodies



Cumulative stressors

Interactions make all the difference.

- Chronic stress
- Disturbances
- Invasive species
- Insect pests
- Forest diseases

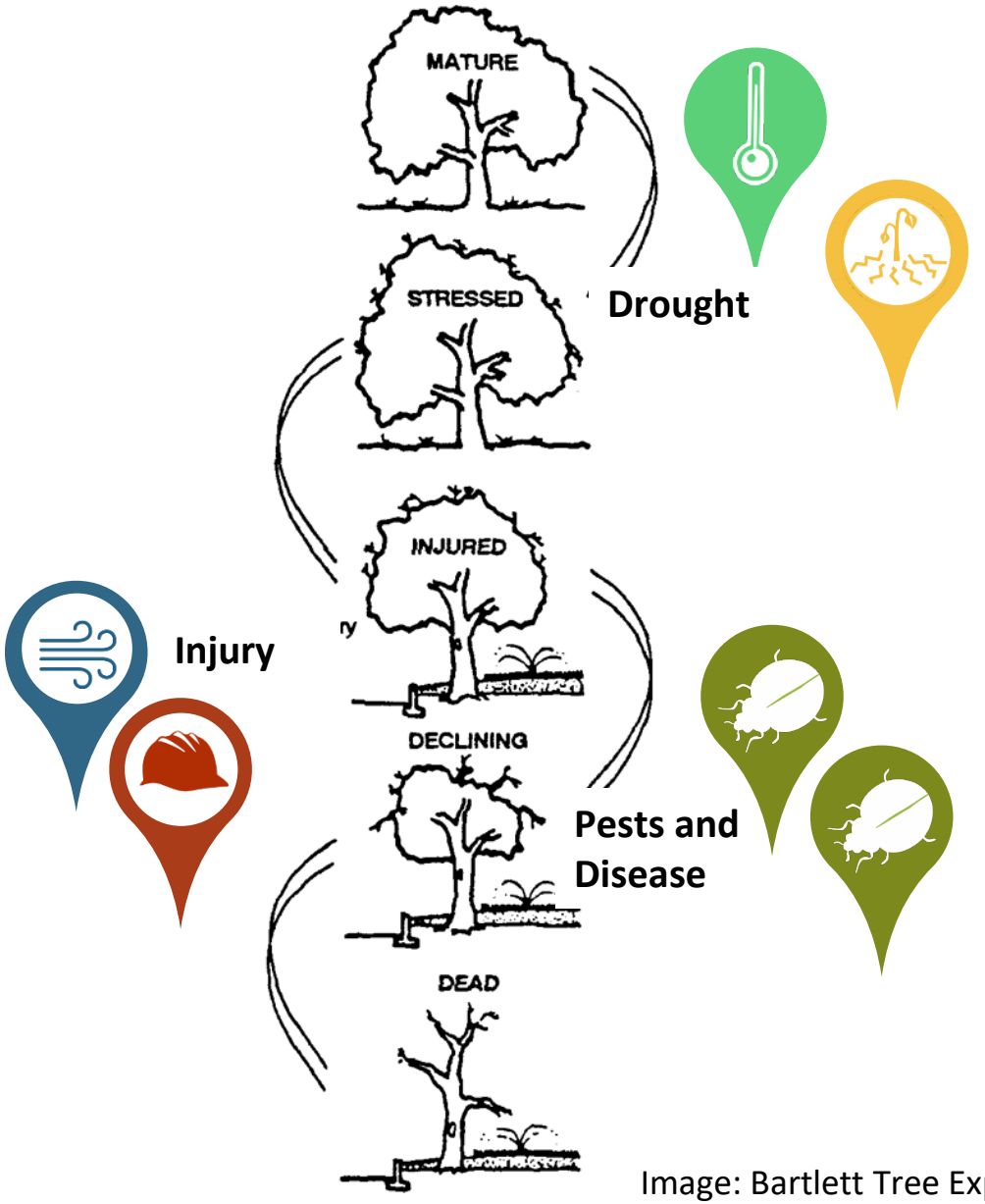
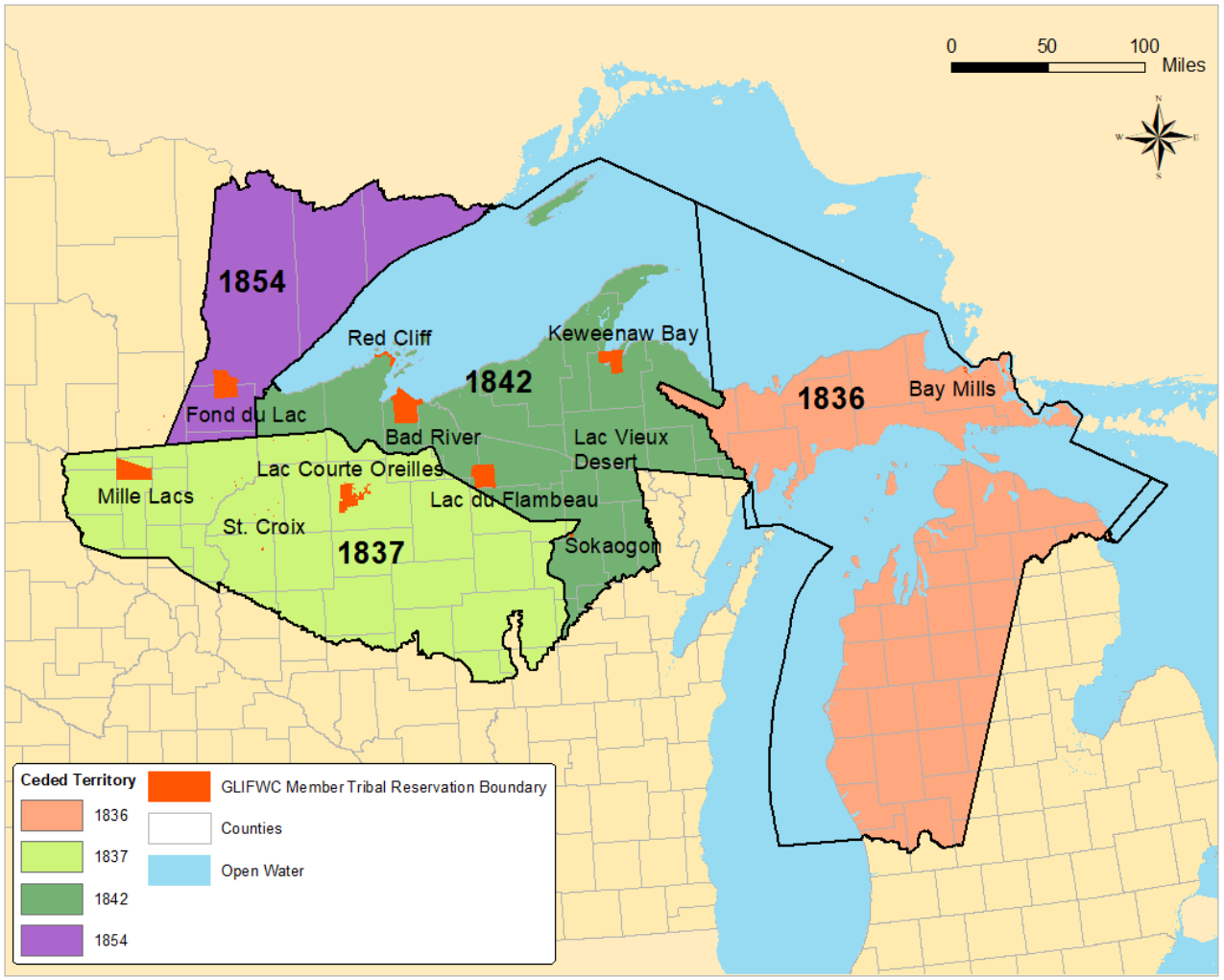


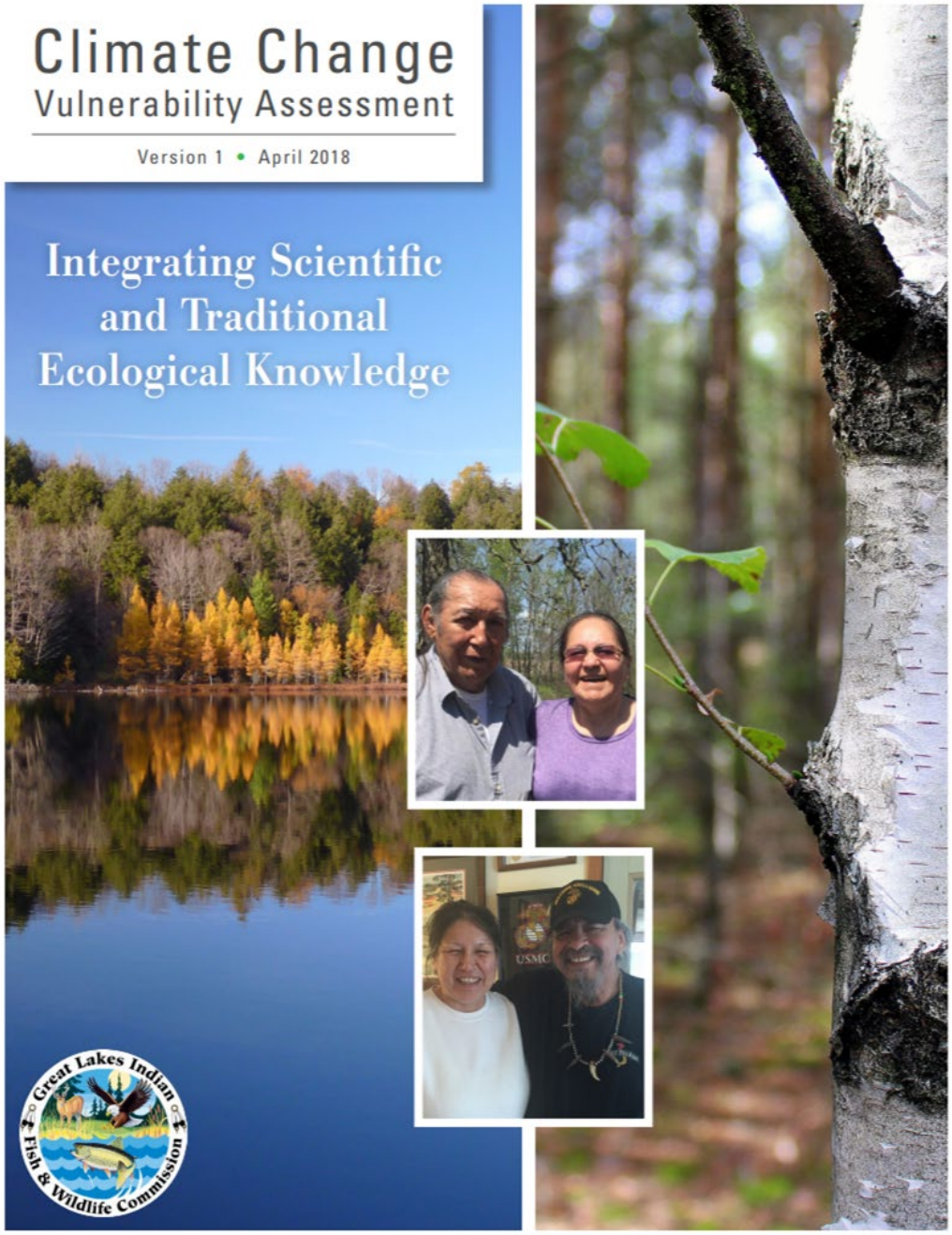
Image: Bartlett Tree Experts

Impacts on Culturally Important Species

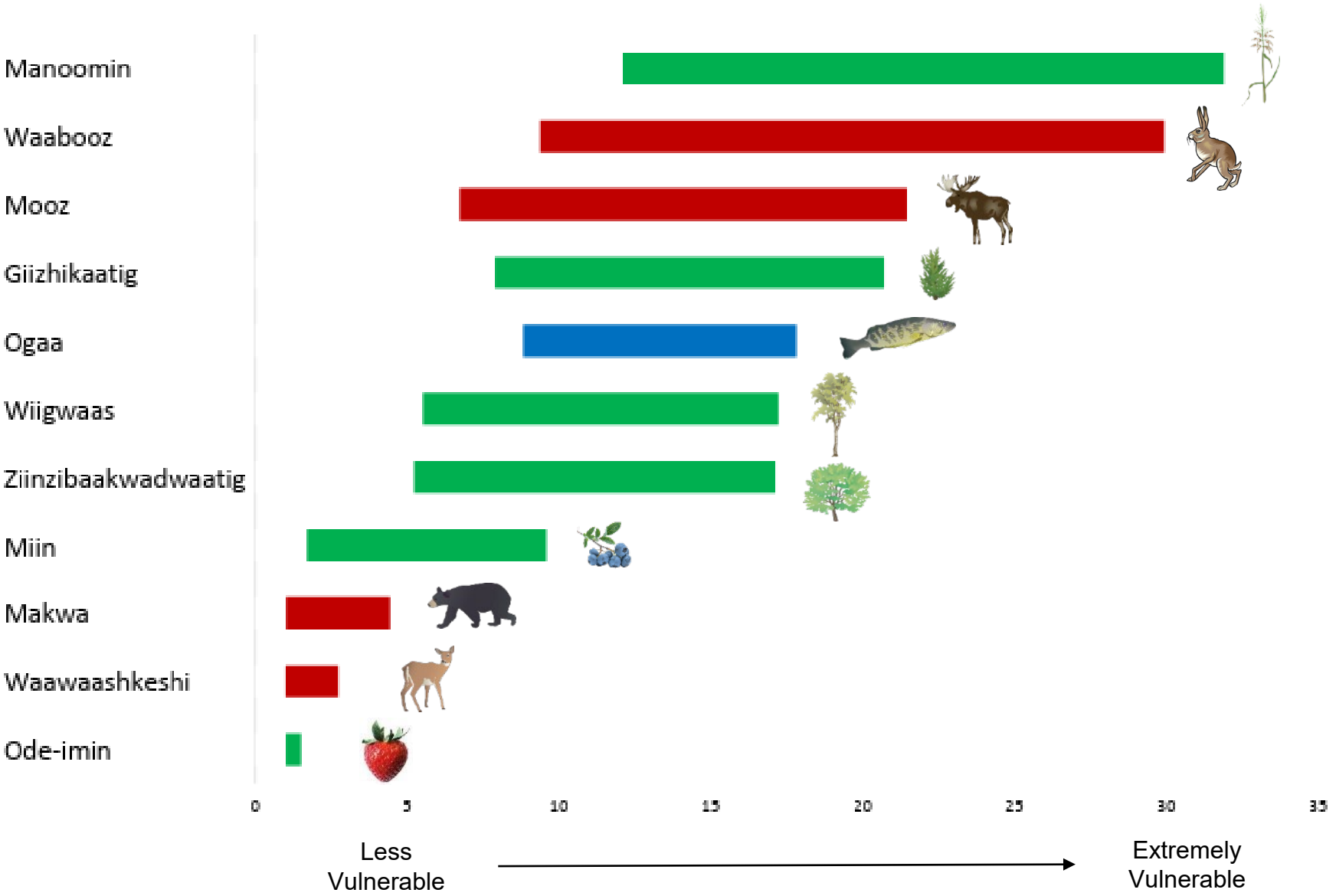
Great Lakes Indian Fish Wildlife Commission



Available at
glifwc.org/ClimateChange



The most frequently mentioned beings are among the most vulnerable



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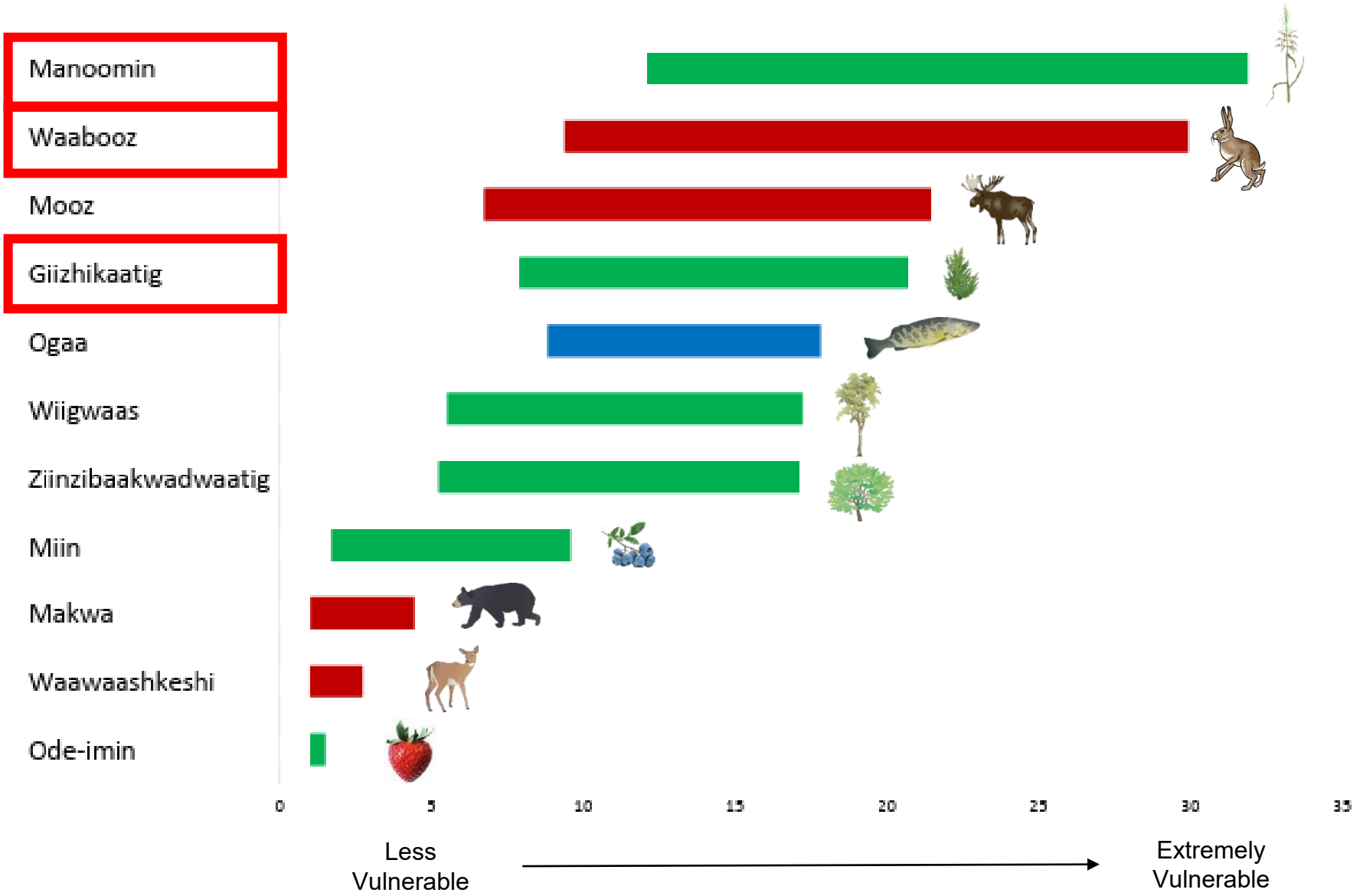
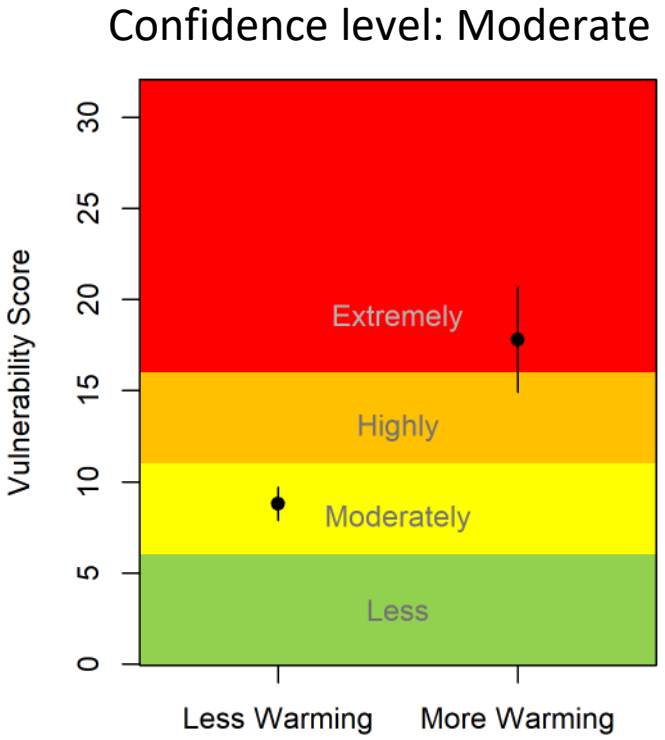


Giizhikaatig (Northern White Cedar)

- Adapted to cool environments
- Susceptible to drought, deer browse
- Requires moist soils
- Dependent on snow
- Suitable habitat projected to decrease

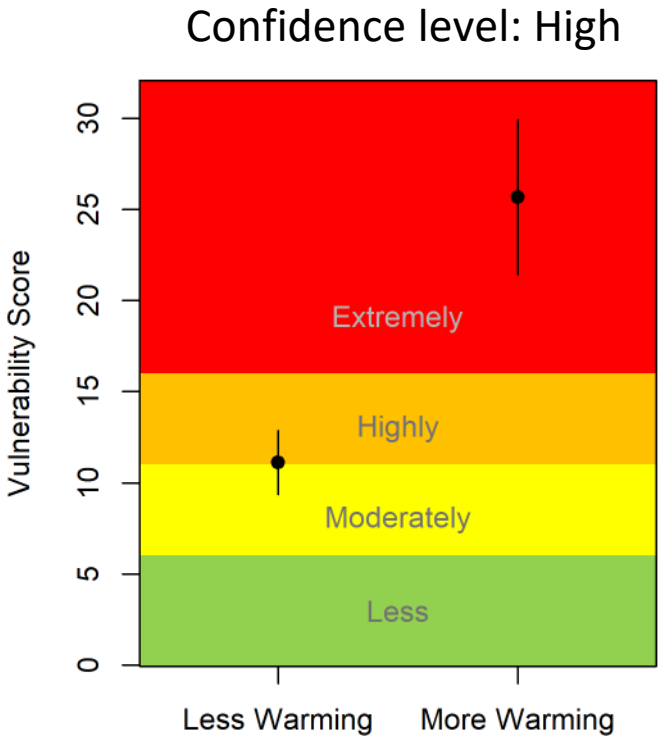
- Used as medicine
- Cedar swamps are drying
- Cedar abundance is decreasing



Waabooz (Snowshoe hare)

- Adapted to cool environments
- Preyed on by coyote, fisher, bobcat
- Low genetic variation
- Mismatch - color change and snowpack
- Documented decline due to climate change
- Modeled future range shows a northward shift

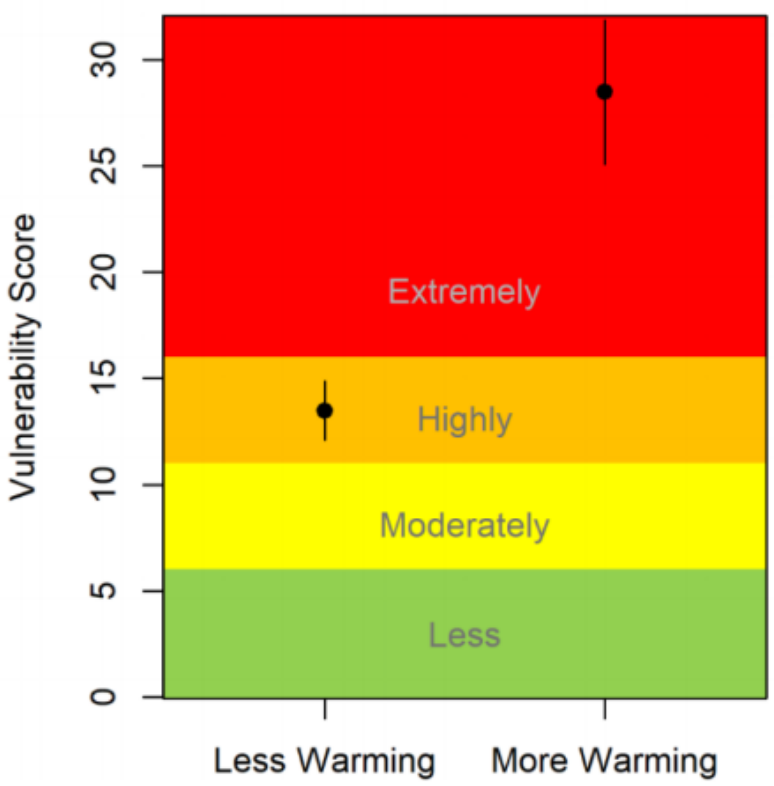
- TEK interviewees all expressed concern about a decline in population over the last 15 years. A decrease in snowfall may be contributing.



Manoomin (Wild rice)

- Affected by human land use changes
- Limited dispersal ability
- Adapted to cool environments
- Particular hydrological requirements
- Susceptible to disturbance, competition, pathogens
- Dependent on ice/snow
- Lack of genetic variation

Confidence level: Moderate



Manoomin (Wild rice)

"According to the little bit I know about wild rice, you have to have the water, it's gotta be just right in order for, otherwise you're gonna drown it."
– *Tom Maulson Sr., Lac du Flambeau*

"You know what I was worried about this mornin'? That rain knocking my rice over."
- *Fred Ackley, Mole Lake*

Michigan Tribal Adaptation Planning

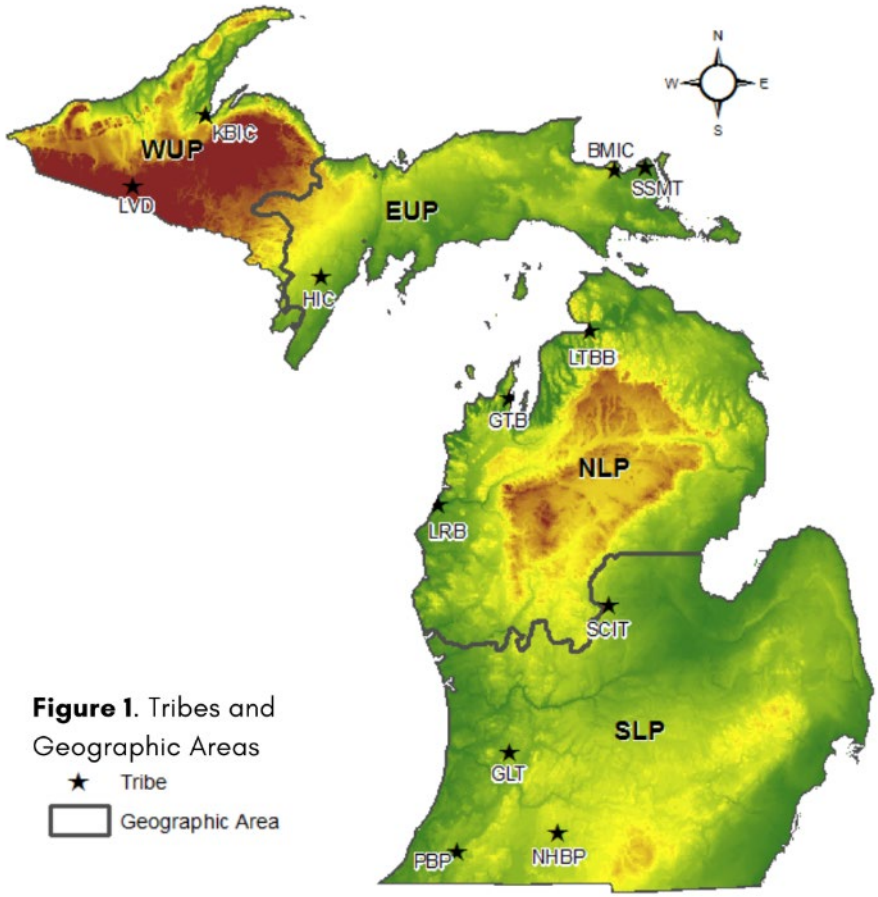


Figure 1. Tribes and Geographic Areas

★ Tribe

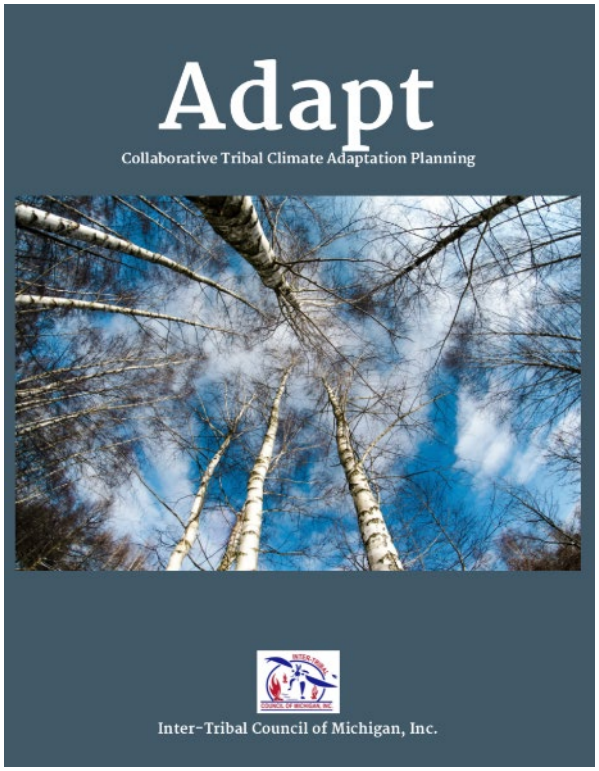
Geographic Area

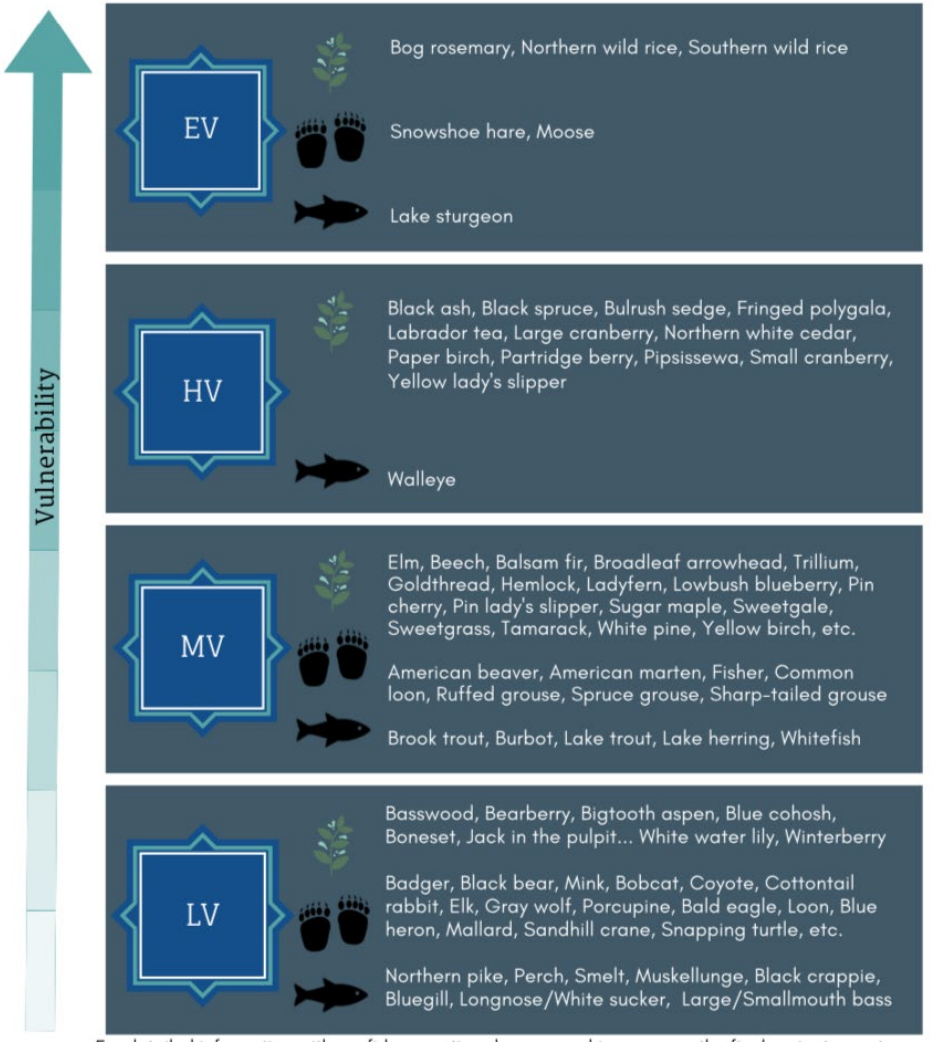
Tribal staff working with tribal members

- Engage Anishinaabe and western scientific ways
- Better understand changes in plants, fish, wildlife, community health, and infrastructure
- Identify ways to support and honor all our relations

Michigan Tribal Adaptation Planning 2015-2016

- 9 Tribes
- 120 plants, fish, and wildlife





Inter-Tribal Forest Understory Adaptation 2017-2018

- 4 Tribes
- 5 plants

BAY MILLS INDIAN COMMUNITY
GNOOZHEKAANING

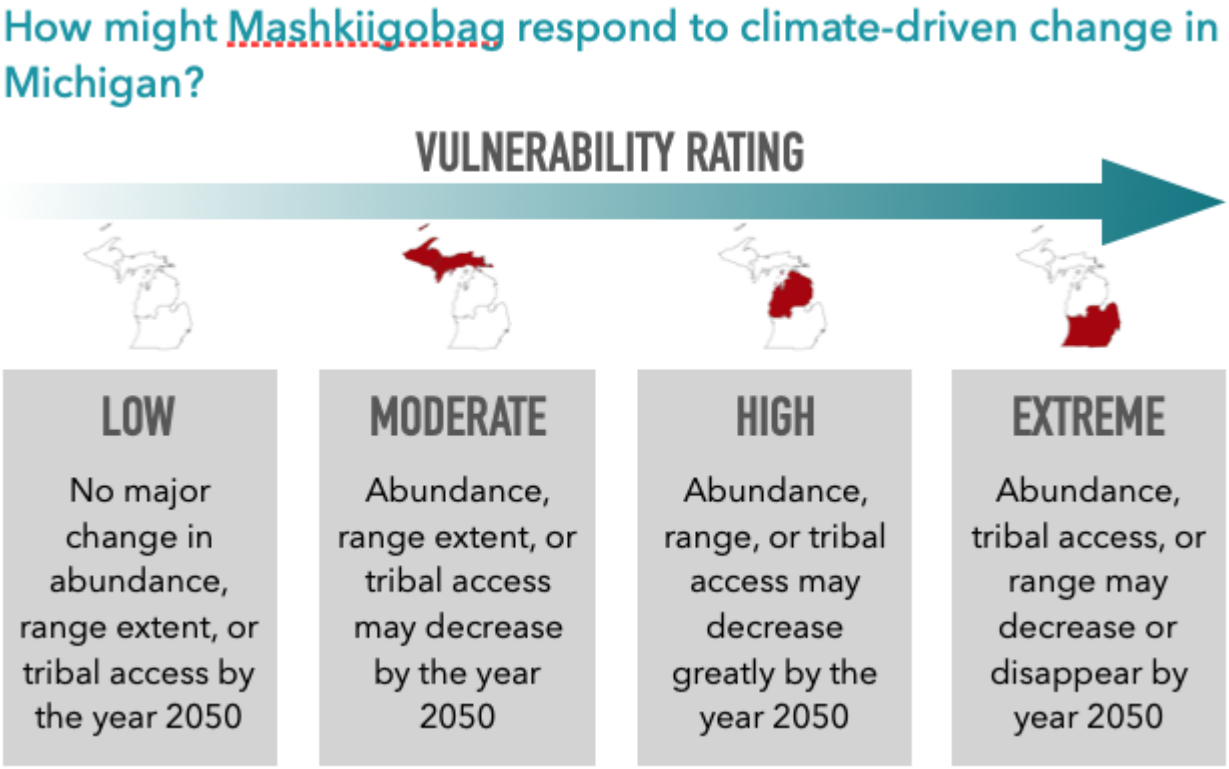
Lac Vieux Desert Band of Lake Superior Chippewa Indians

INTER-TRIBAL COUNCIL OF MICHIGAN, INC.
Ottawa
Ojibwa
Potawatomi

Saginaw Chippewa Indian Tribe of Michigan

POKÉGWEK
BODÉWADMIK

Inter-Tribal Forest Understory Adaptation



Climate-driven changes	Possible impacts on Mashkiigobag	What to watch for
Increasing temperatures The average temperature increased by 2 F° over the past century and may increase 4-6 F° by 2050.	Mashkiigobag are at their southern limit in Michigan and grows in cooler areas of the forest, which may become too warm for Mashkiigobag to grow.	Have you noticed changes in how or where Mashkiigobag grows? Are they limited to the coolest areas of the forest?
Drier soils Increased air temperatures may lead to warmer and drier soils, especially in mid- to late-summer.	Mashkiigobag may be out-competed by other plants as soils warm, dry out, and become more nutrient-rich.	Have there been changes in how wet or dry the places are where Mashkiigobag grows?

Final thoughts

- Many resources of tribal interest are vulnerable to climate change
- TEK and SEK complement each other and strengthen our overall knowledge of climate change vulnerability
- We need to use both knowledge systems to move forward in adapting to climate change

Jim & Pat Northrup
Fond du Lac Reservation
Photo by Melonee Montano

Adaptation Concepts

Responding to climate change

Mitigation = actions that reduce the human contribution to the greenhouse gas effect.

Adaptation = actions to prepare for and adjust to new conditions.

An Uncertain Future

Don’t wait for the crystal ball…

Climate impacts

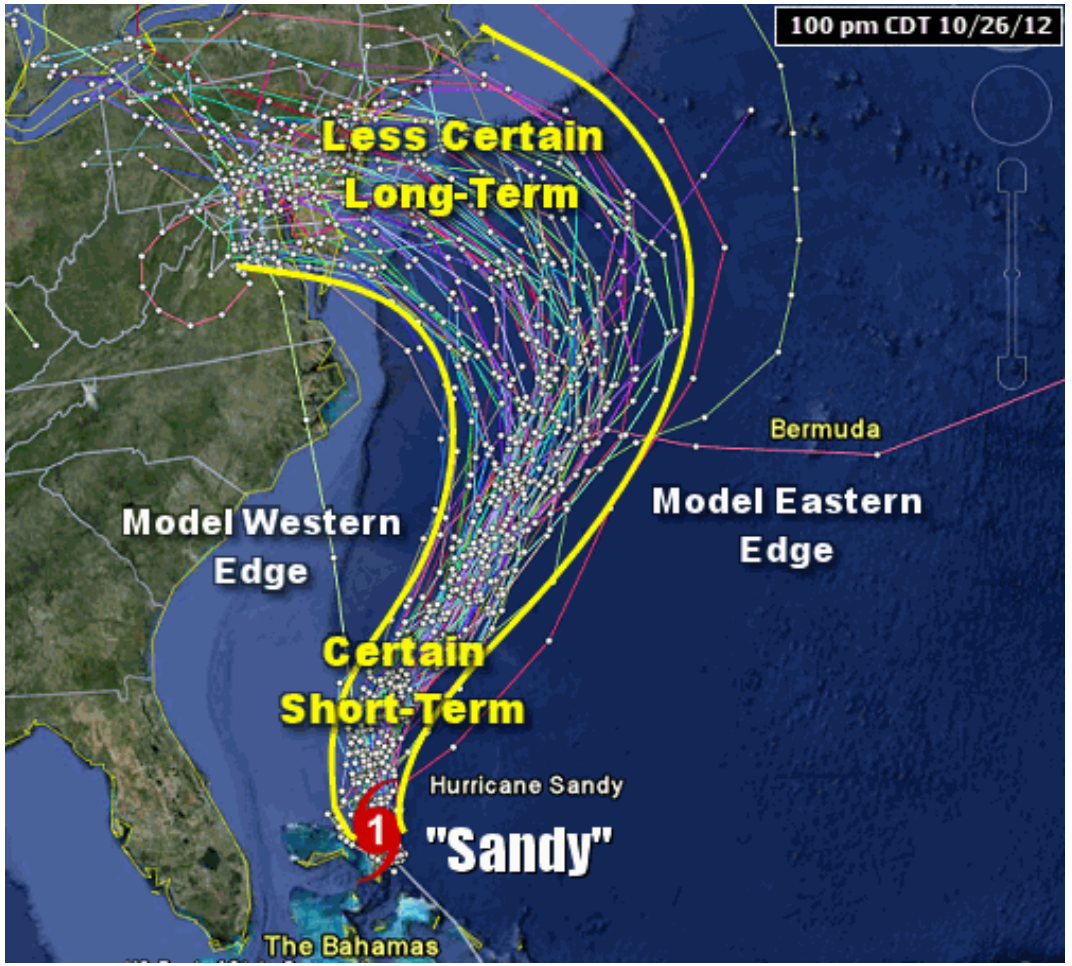
Adaptation concepts

Tribal adaptation menu

Preparing for the workshop

An Uncertain Future

We don't need certainty to act



Plan for a Range

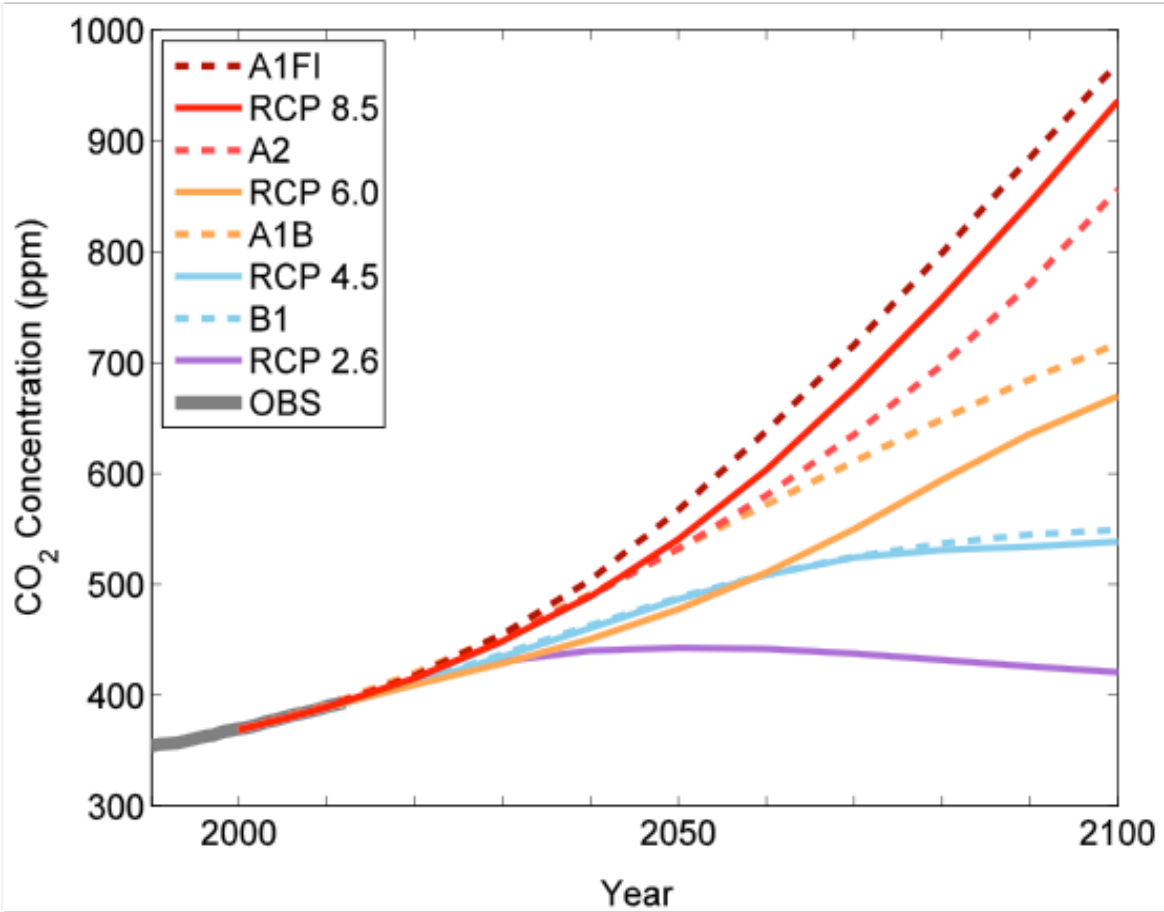


Figure Source: IPCC 2007, 2014

Adaptation Concepts

Reduce impacts / Maintain current conditions

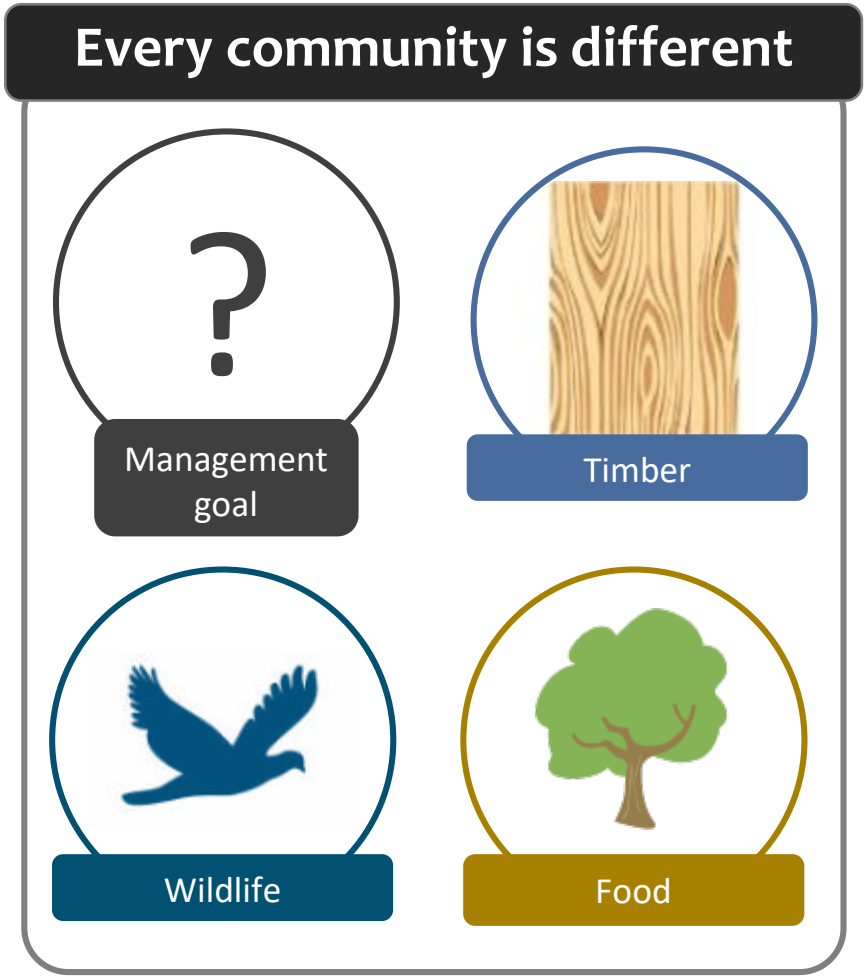
Manage for Persistence:
Ecosystems are still recognizable as being the same system (character)

Manage for Change:
Ecosystems have fundamentally changed to something different

Intentionally promote change

Millar et al. 2007, Stein et al. 2014

There isn’t a single answer



Each decision is unique and will vary based upon:

Place: Location & Site Conditions

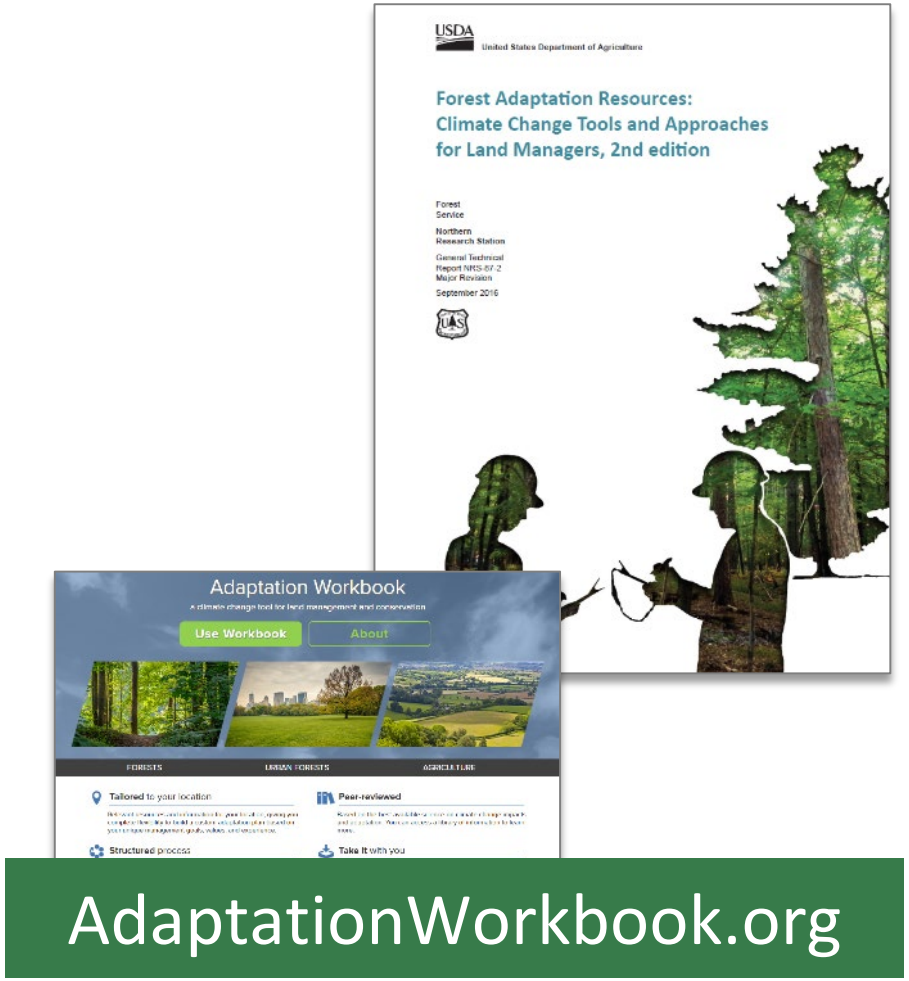
Purpose: Goals & Objectives

People: Values, Culture, & Mission

Practices: Equipment, Procedures, & Methods

Adaptation Resources + Workbook

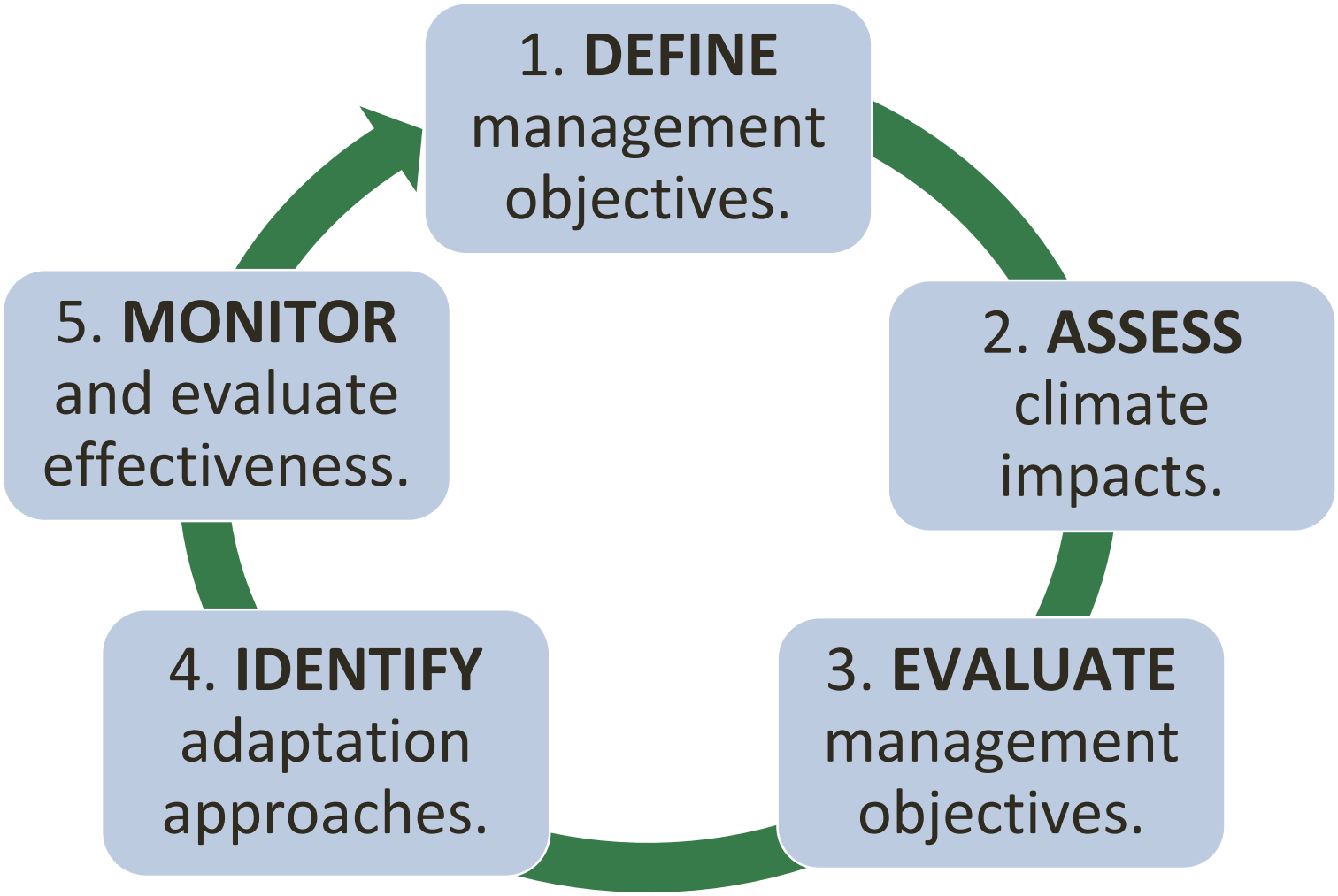
- Practical process to intentionally consider climate
- Designed to be flexible – for diverse goals, and values
- Does not make recommendations – users customize actions



AdaptationWorkbook.org

Swanston and Janowiak 2016; www.nrs.fs.fed.us/pubs/52760

Preview of the workshop process



Swanston et al. 2016; www.nrs.fs.fed.us/pubs/52760

Adaptation Menus

A collection of plausible adaptation actions that is:

- Specific to a discipline
- Organized into a tiered hierarchy
- Thorough and comprehensive (including opposing ideas!)

Brunch

Classics

Lemon Ricotta Pancakes Whipped Mascarpone Maple, Berries	15	**AJ's Omelet** Fontal Cheese, Spinach, Mushrooms	14
Cornflake Crusted French Toast Berries, Maple Syrup	15	**Eggs Florentine** Spicy Capicola, House-Made Cheddar Biscuit, Spinach	15
Bacon, Egg & Cheese Bacon, Two Eggs, Taleggio Cheese, Ciabatta	14	**Porchetta Hash** Poached Egg, Calabrian Chili Hollandaise	16
Avocado Toast Poached Eggs, Tomatoes, Chili Flakes, Sea Salt	15	**Chia Pudding** Chia Seeds, Toasted Coconut, Banana, Strawberry	14
Chicken Parmigiana Spicy Marinara, Fresh Mozzarella	22	**Farmhouse Breakfast** Two Eggs, House-Made Cheddar Biscuit, Chicken Sausage	14
Squid Ink fettuccine Vongole Little Neck Clams, Garlic, White Wine, Butter, Chili	22	**Chicken Kale Caesar** Chicken, Kale, Croutons	16

Create Your Own Pasta

Shapes		Sauces	
Rigatoni Semolina, All-Purpose Flour, Olive Oil	14	**Marinara** San Marzano tomatoes, Garlic, White Wine, Basil, Chili	
Cavatelli All-Purpose Flour, Durum Flour, Eggs, Ricotta	15	**Arrabiata** All-Purpose Flour, Durum Flour, Eggs, Ricotta	+1
Tagliatelle All-Purpose Flour, Durum Flour, Eggs	15	**Broken Meatball** House Tomato Sauce with the Addition of Broken Meatballs	+4
Gluten-Free Rigatoni Gluten-Free All-Purpose Flour, Olive Oil, Eggs	16	**Sunday Sauce** House Tomato Sauce with Short Rib, Sausage, Veal	+4
Spaghetti Semolina, Durum Flour, Olive Oil	15	**Roasted Garlic Pecorino** Semolina, Durum Flour, Olive Oil	+2
Four Cheese Herb Ravioli Fontal, Ricotta, Parmesan, Pecorino	18	**Carbonara** Pancetta, Eggs, Peas, Pecorino	+3

Sides

Pecorino Truffle Fries	8
Potato Hash	6
Bacon	6
Turkey Sausage	6
Field Greens	7
Two Eggs Any Style	6
Beignets	8
Baked Goods	10

Brunch Cocktails

Bloody Mary Vodka, Spiced Fresh DOP Tomato Juice, Horseradish	10/45
Cointreau Spritz Cointreau Spritz, Aperol, Crème de Peche, Sparkling Wine	12/55
Green Side Reyka Vodka, Green Juice, Lemon	12/55
Morning Derby Bourbon, Grapefruit, Ginger, Carrot Juice	12/55
Sangria Red Wine, Fresh Fruit, Pisco, Crème de Peche	10/45
Firing Squad Milagros Tequila, Cointreau, Fresh Lime, Grenadine	12/55
Tall Mimosa Reyka Vodka, Cointreau, Jake's Mimosa Juice, Sparkling Wine	12/55

Adaptation Menu Benefits

Address challenges in implementing adaptation:

1. Connecting broad ideas to specific actions
2. Making actions intentional
3. Communicating your ideas
4. Boosting creativity

Adaptation Menus

1. Connecting Broad Ideas to Specific Actions

Option: Resistance
(forestall change)

Adaptation Menus

1. Connecting Broad Ideas to Specific Actions

Strategy 4. Sustain fundamental ecological and cultural functions

Adaptation Menus

1. Connecting Broad Ideas to Specific Actions

Approach 4.5.
Revitalize and maintain Anishinaabe/cultural use of ishkode (fire) as a stewardship tool.

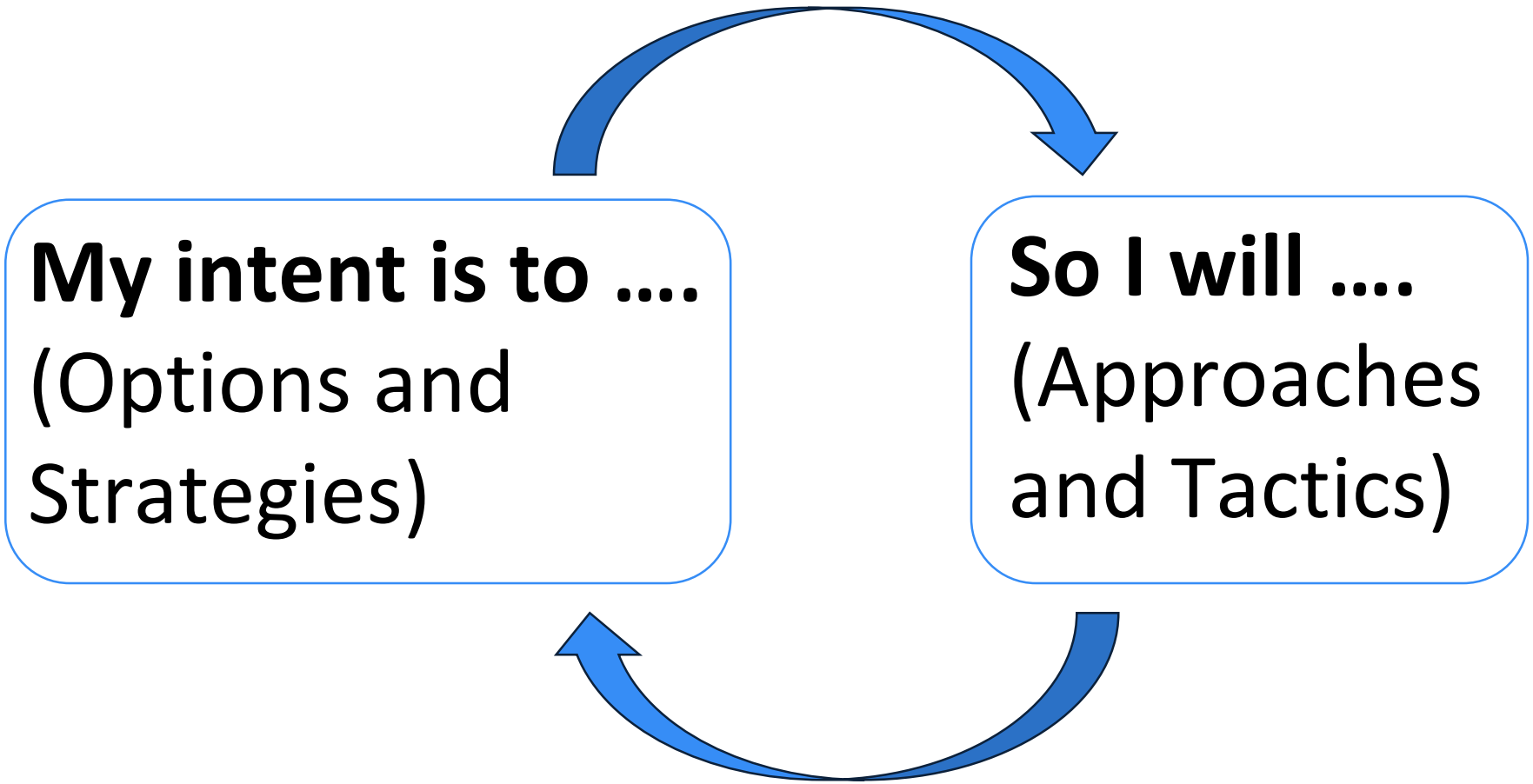
Adaptation Menus

1. Connecting Broad Ideas to Specific Actions

Tactic: Use prescribed burns in marsh habitats to encourage young plant communities

Adaptation Menus

2. Making Actions Intentional



Adaptation Menus

3. Communicating your Ideas

Photo: Robin Clark, Baawaating

Adaptation Menus

4. Boosting Creativity

Photos and beadwork by Josh Hudson, Gnoozhekaaning

The need for indigenous perspectives

- Adaptation menus have been reflective of western science and a resource-centric perspective
- Needed to create a menu reflective of Indigenous knowledge and kin-centric perspectives

Tribal Adaptation Menu & Guiding Principles

Tribal Adaptation

Indigenous peoples have adapted to environmental change for millenia

We have a responsibility to understand and support our relatives

- Change in access-relations
- Fixed boundaries - reservations, treaty-ceded territories

Origins: Tribal Adaptation Menu

In the Spring of 2017, NIACS held an *Adapting Forested Watersheds to Climate Change Workshop* in Minocqua, WI

– Case Study Wild Rice Restoration project that was to be used with the NIACS Adaptation Workbook and Adaptation Menu

Purpose: Tribal Adaptation Menu

- Create a new climate adaptation approach menu
  - Decision-making and conduct rooted in Indigenous ways
  - Engage Indigenous sciences and knowledges
- Trend of Euro-centric science looking to Indigenous knowledge, which has been the foundations of our existence for millennia

Multiple Perspectives

- Indigenous perspectives call for observation, recognizing and learning from our first teachers, and adaptation that addresses responsibility and reciprocity to all our relations
- Western perspectives emphasize control and management of non-sentient resources

Adaptation & Natural World

Abundance of adaptation options from Western perspectives

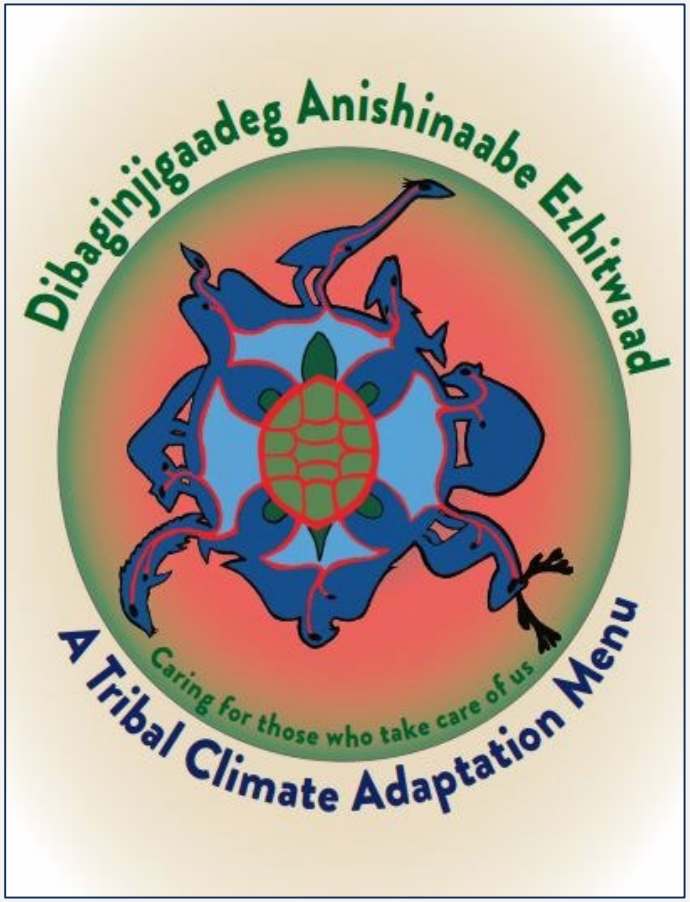
- Instead of waiting for systems to naturally establish themselves, managers are tasked with selecting and managing for specific future forest/aquatic/natural communities

The Tribal Adaptation Menu offers a different perspective on adaptation

Three R's: Respect, Reciprocity, and Relationships

- Decisions for use of our relatives were originally communal decisions made with recognition and acknowledgement throughout
- Today management and decision-making for land and the natural environment is made less as a communal decision and more as an individual or institutionalized

Tribal Adaptation Menu



No singular native, tribal or indigenous approach for caring of the land

- Suggestions to assist in addressing needs of a particular indigenous community
- Used by non-tribal people or organizations interested in indigenous approaches to adaptation

Guiding Principles for Interacting with Tribes

How to Develop Culturally Appropriate Climate Adaptation Actions

Offering asemaa/nāēqnemaw (tobacco). (Photo by Charlie Rasmussen, GLIFWC.)

This document is intended to empower tribal governments, federal and state agencies, non-governmental organizations (NGOs), individual landowners and others to incorporate Anishinaabeg perspectives, specifically from the Great Lakes region, into a climate adaptation framework. We recognize the shortcomings of this document in our attempt to incorporate indigenous concepts, language, and cultural practices; a single document written in English can't fully capture what we intend to express. We hope that the perspectives given here offer users an additional lens with which to view the environment and facilitate a more culturally appropriate approach to working with tribal nations.

While the intent of this document is to give specific examples from one group of people, we encourage other tribes to edit these according to the needs of their individual community by adding language, words, and concepts unique to that community. We should stress that the editing process be undertaken first, before initiating any project, as the intent behind this document is to ground climate change adaptation planning in knowledge that is unique to the perspective of each indigenous community.

- Designed for use by tribal communities and their non-tribal partner agencies
- Strategy/approach/tactic framework
- The first three strategies address cultural practices, community engagement and recognizing human and non-human reciprocal relationships
- Emphasizes that sometimes not doing something may be appropriate

Menu of Adaptation Strategies and Approaches

Strategy 1: Consider cultural practices and seek spiritual guidance.

Indigenous knowledges and ways can provide the backbone for successful climate adaptation. Seeking guidance from the community on adaptation needs and actions, respecting and building on dynamic relationships, and honoring cultural responsibilities and histories may benefit both short- and long-term adaptation efforts.

1.1. Consult cultural leaders, key community members, and elders.

Cultural leaders, community members, harvesters, elders, and other key individuals have important knowledges and perspectives that can inform climate adaptation activities. Taking time to build relationships and properly consult with the broader community will result in more informed decisions and more support for adaptation actions.

Example tactics:

- Conduct community engagement workshops to learn about past changes using specific examples or important resources as discussion points.
- Interview wild rice gatherers to discuss observed impacts on wild rice from storm events or changing lake levels.
- Work with tribal leaders and members to identify knowledgeable individuals in the community, such as elders, and how to consult with them in a good way.
- Build organizational capacity by funding outreach staff who are trained to discuss climate change with the community.

Pat and Chibinesiban Jim Northrup from Fond du Lac Band of Lake Superior Chippewa. Chibinesiban Jim Northrup has since walked on. (Photo by Melonee Montano, GLIFWC.)

1.2. Consider mindful practices of reciprocity.

Healthy relationships depend on reciprocal exchanges of gifts, knowledge, and respect, among others. For example, it is appropriate to offer asemaa/nāēqnemaw (tobacco) when requesting permission to use a gift (resource). This principle applies to land management as well as interpersonal relationships within the community.

Example tactics:

- Offer asemaa/nāēqnemaw (tobacco) when requesting permission to use a gift (resource).
- Provide gifts when seeking guidance or knowledge from elders or community members.
- Share data and results of climate change assessments and adaptation projects with the local community.
- Ensure that teachers and contributors are credited in presentations, public documents, and materials.
- Teach harvesting in a good way, such as taking only what you need and leaving enough to sustain a population. For example, harvesters should refrain from harvesting wild rice when it is raining, because it can weaken the root system.

1.3. Understand the human and landscape history of the community.

Every place has a unique context and unique stories to tell. The history of the community and the land can inform land management decisions, and it is worth investing time and attention to cultivate a deeper understanding of a place before deciding on appropriate management actions.

Example tactics:

- Identify and meet with Tribal Historic Preservation Officers and discuss the history of the local community.

Culturally Relevant Adaptation

Forest Adaptation Menu:

Strategy 9: Facilitate community adjustments through species transitions.

Approach 9.7: Introduce species that are expected to be adapted to future conditions.

Tribal Adaptation Menu:

Strategy 11: Encourage community adjustments and transition while maintaining reciprocity and balance.

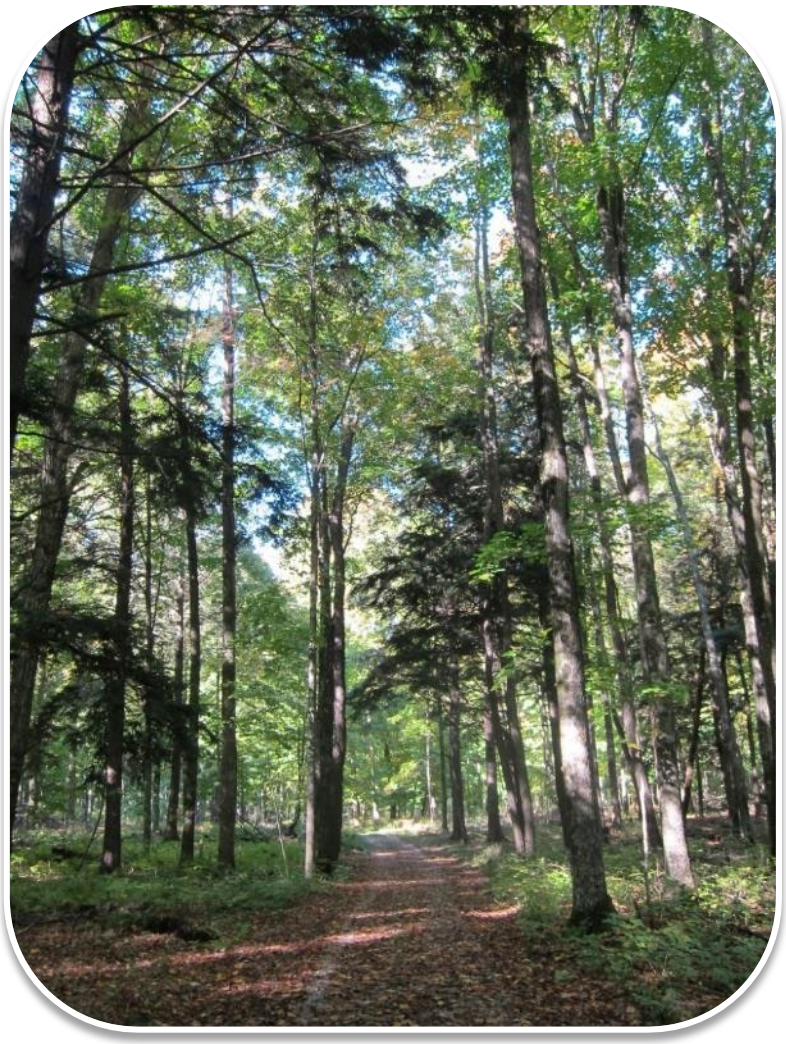
Approach 11.4: Seek out and share traditional and cultural knowledge of potential new beings from tribal communities where these beings are native.

Preparing for the Workshop

Before the Workshop

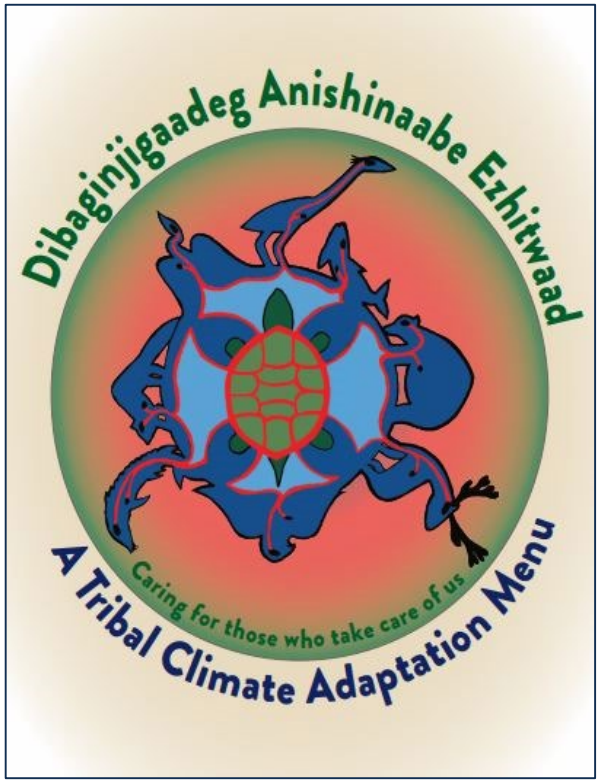
- Read through the Guiding Principles and Tribal Adaptation Menu

- Complete “Step 1” of the adaptation workbook, for a project of your choice, using the template worksheet.



Before the Workshop

- Read the Guiding Principles
- Read through the Tribal Adaptation Menu



Outline of the Menu's Strategies and Approaches

Strategy 1: Consider cultural practices and seek spiritual guidance.
1.1. Consult cultural leaders, key community members, and elders.
1.2. Consider mindful practices of reciprocity.
1.3. Understand the human and landscape history of the community.
1.4. Hold respect for all of our relations, both tangible and intangible
1.5. Maintain dynamic relationships in a changing landscape.

Strategy 2: Learn through careful and respectful observation (gikinawaabi).
2.1. Learn from beings and natural communities as they respond to changing conditions over time.

Strategy 3: Support tribal engagement in the environment.
3.1. Maintain and revitalize traditional relationships and uses.
3.2. Establish and support language revitalization programs.
3.3. Establish, maintain, and identify existing inventory and monitoring programs.
3.4. Establish and maintain cultural, environmental education, and youth programs.
3.5. Communicate opportunities for use of tribal and public lands.
3.6. Participate in local- and landscape-level management decisions with partner agencies.

Strategy 4: Sustain fundamental ecological and cultural functions.
4.1. Maintain or restore hydrology and soils.
4.2. Maintain or restore riparian areas.
4.3. Maintain or restore nibi (water) quality
4.4. Support specific plants or plant communities with essential requirements.
4.5. Revitalize and maintain Anishinaabe/cultural use of ishkode/fire as a stewardship tool.
4.6. Maintain and revitalize cultural approaches to harvesting and caretaking.

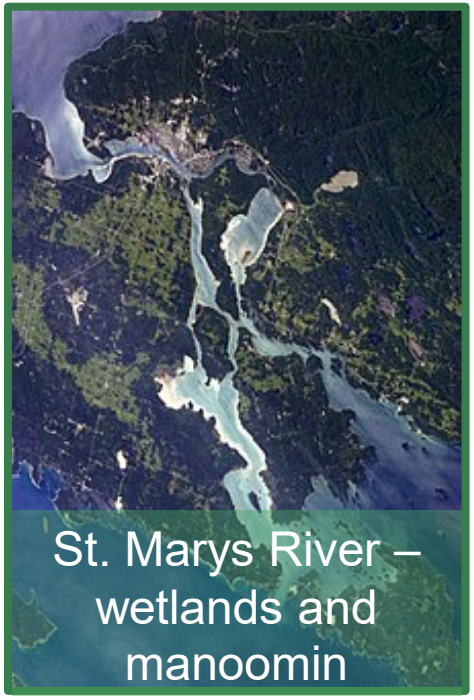
Step 1: DEFINE area of interest, program goals and objectives, and time frames.

What project should I choose?

- Something you're working on now!
- Something from your IRMP
- Something you want to spend time discussing.
- You're encouraged to submit a project as a group – just let us know.

Step 1: DEFINE area of interest, program goals and objectives, and time frames.

Bay Mills Project – cedar planting OR leek restoration



St. Marys River – wetlands and manoomin

Dowagiac River and Peavine Creek – Restoration for Salmonids

EUP Natural Hazards Mitigation Plan

Step 1: DEFINE area of interest, project or program goals and objectives, and time frames.

Send to Stephen Handler (Stephen.handler@usda.gov).

Project Area:			
Location:			
Ecosystem	Management Goals	Management Objectives	Time Frames

Step 1: DEFINE area of interest, program goals and objectives, and time frames.

Goals: What are your desired outcomes?

Objectives: How do you plan to achieve these outcomes?

Step 1: DEFINE area of interest, program goals and objectives, and time frames.

Example Goal:

- *Improve wildlife habitat for game species in a tribally owned hunting area.*

Example Objective:

- *Implement prescribed burns across 100 acres of property to encourage growth of mast species like northern red oak.*

Step 1: DEFINE area of interest, program goals and objectives, and time frames.

Think about how you're already considering the community:

- ***Strategy 1:*** *Consider cultural practices and seek spiritual guidance.*
- ***Strategy 2:*** *Learn through careful and respectful observation (gikinawaabi).*
- ***Strategy 3:*** *Support tribal engagement in the environment.*

Step 1: DEFINE area of interest, program goals and objectives, and time frames.

Please send your worksheet to Stephen by May 29!

Sooner is better!

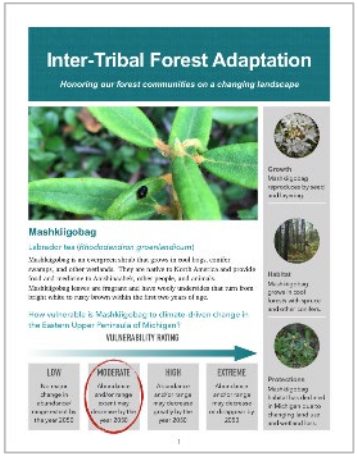
For more background …

Look over some information on ecosystem vulnerabilities:

Forest Assessments:
https://forestadaptation.org/vulnerability-assessment

Culturally Important Species, Health, Infrastructure (ITCMI)
www.itcmi.org/departments/environmental-services/

Culturally Important Species (GLIFWC)
data.glifwc.org/archive.bio/GLIFWC_Climate_Ch
_Vulnerability_Assessment_V



Your own Vulnerability Assessments!

For more background …

Talk to your elders, hunters, gatherers, first-language speakers, youth, and other community members

Photo: Robin Clark, Baawaating

Photo: Robin Clark, Baawaating


Questions ?