

Gikinoo'wizhiwe Onji Waaban (*Guiding for Tomorrow*) **or "G-WOW"** **Changing Climate, Changing Culture Initiative**

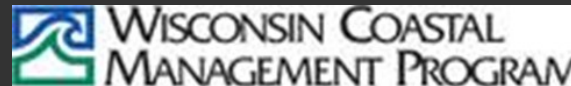
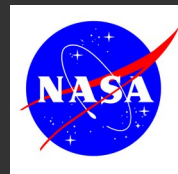
*Integrating TEK and Climate Science through service
learning climate literacy program*

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NOAA Climate Steward

G-WOW Project Partners



Additional support



Project Location:

**Lake Superior's Chequamegon Bay and
Ceded Territory of the Lake Superior Ojibwe**

**Based at the Northern Great Lakes Visitor
Center**

**G-WOW Model is applicable to other
locations, cultures**



What Issues Does This Project Address?

Concern about how changes in climate were affecting Lake Superior environment, communities, and public safety

Concern about climate change impacts Ojibwe treaty rights and traditional cultural practices

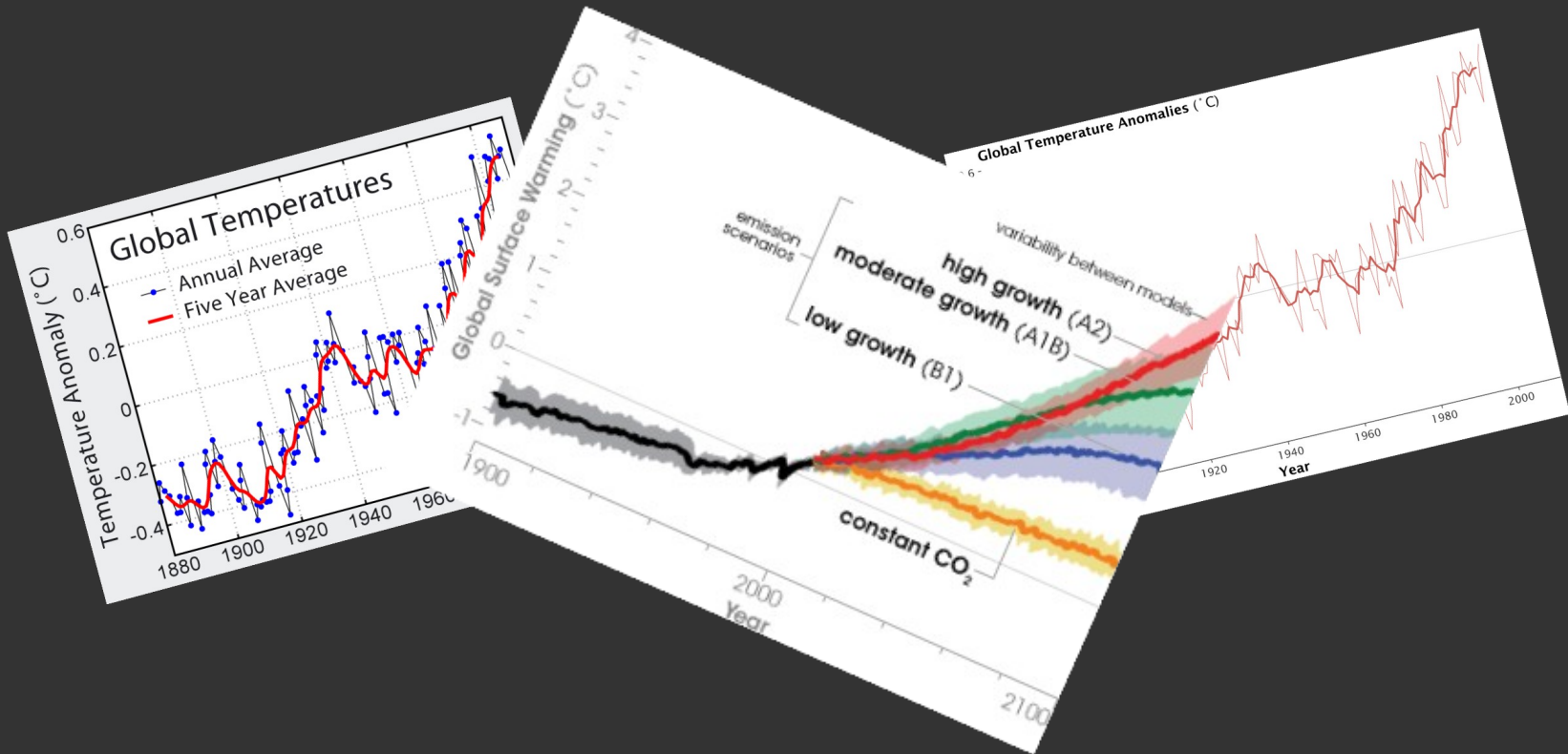


Extreme Storm Events: 2014, 2015, 2016



Loss of wild rice, Kakagon Sloughs

**“Traditional” climate literacy models based on
“technology transfer” of scientific information
were not resonating with audiences**



**Diverse project partners came together in 2009 as
the G-WOW Team to develop a new climate change
educational outreach strategy**



Our Goal through G-WOW

**Engage people to take action on climate
change
through awareness of how a changing climate
impacts
their culture and community**

Research Basis for the G-WOW Model

“...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



Where Did the Idea of G-WOW Come From?

Guidance by tribal elders.... Sharing an understanding how climate change is affecting traditional Ojibwe lifeways as an indicator of how climate change is affecting all cultures

Make climate change “come alive” to people... through place-based evidence are experiencing, on activities they valued in their culture

Using TEK... to provide a “baseline” for evaluating place-based evidence of climate change and appreciation for climate impacts on Native people

Do Culture and Science Agree? ...linking TEK and place-based climate evidence with western science through the sustainability of species and habitats that support cultural and business practices

Don't forget the “Big So What?”... taking action on climate change through service learning projects,

What's Different about G-WOW approach?



Revealing how climate change is affecting the sustainability of species and habitats that support cultural and economic practices people value by integrating place-based evidence they can with climate science to provoke action



The G-WOW model uses climate impacts on Ojibwe cultural practices as a place-based indicator of a changing climate for all cultures

The Lake Superior Ojibwe have relied on the sustainability of plant and animal species for generations to support subsistence, cultural, and spiritual practices or “lifeways”



Tribes have traditional ecological knowledge (TEK) of natural systems and language that provides long term place-based indicators of climate change beyond weather variability



Creates a culturally relevant climate change perspective

Links place-based evidence with scientific climate change research

Makes the model transferrable across different cultures

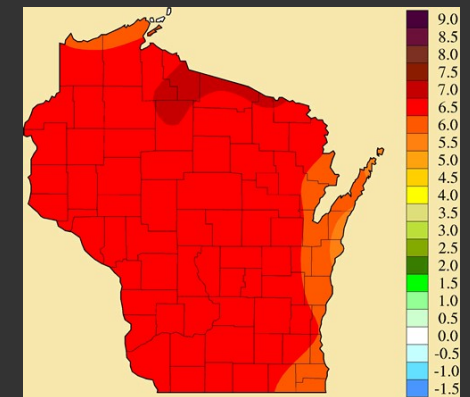


G-WOW Key Principles

- **Climate change is real**
- **Weather and climate are different**
- **Climate affects culture**
- **Humans contribute to climate change**
- **We can make a difference**



The Ojibwe cultural practice of birch bark harvesting depends on the sustainability of Paper Birch, a species that relies on a cool to cold climate



Projected change in Wisconsin's annual average temperatures in °F, 1980-2055

CLIMATE WINNERS & LOSERS



Climate change will affect the habitat conditions that species depend on to thrive and survive

We depend on the sustainability of these species for supporting our cultures and economies



The G-WOW Model: integrating quantitation and qualitative evidence of climate change

Cultural/ Economic Practice

**A cultural
or
economic
practice
you enjoy
or rely on**



Key Species/Habitats

**What
species or
habitat
conditions
are
needed to
support
this**

practice?

*If a species,
what habitat
conditions does
it need to
survive and
thrive?*



Place-based and Scientific Evidence

**What changes are
being observed in
the habitat, the
species or
cultural practice?**

**How are
environmental
variables critical
to supporting the
habitat
conditions
projected to
change based on
climate science?**

*Variables may include:
temperature,
precipitation, drought,
intense rain/storms*

Applying the G-WOW Model

Cultural Practice

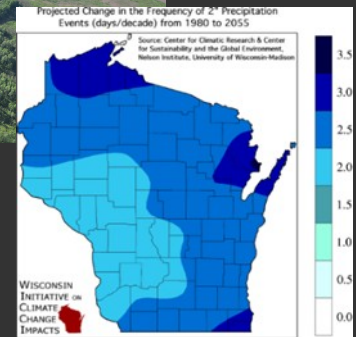
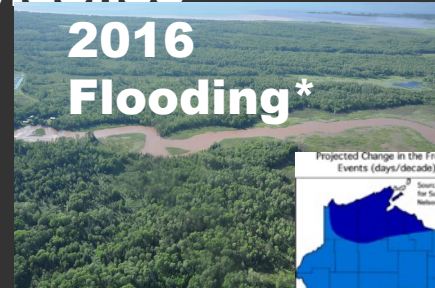


Key Species



*Requires shallow water,
moderate water level changes,
cool growing season*

Place-based & Scientific Evidence



*Projected frequency of
2"+ rain events,
1980-2055*

*** Unprecedented cancellations/disruptions in Bad River Tribe's wild rice harvests based on TEK (2007-2012), 2016**

What does this mean for sustainability of manoomin and cultural practices that rely on manoomin?

Cultural Practice



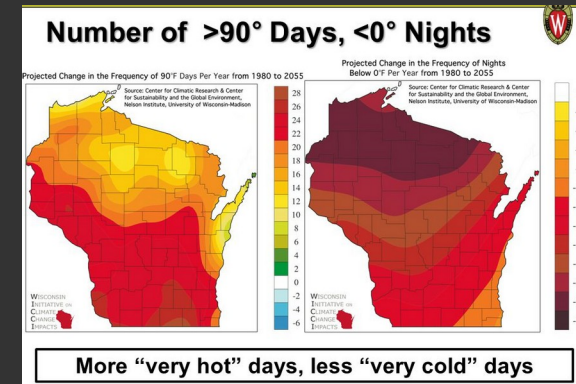
Key Species



Place-based & Scientific Evidence



Requires cool moist forest habitats, cold winters for sugar production



Projected frequency of days over 90-degrees F, 1980-2055

**What does this mean for sustainability of sugar maple,
the future businesses the rely on sugar maple?**

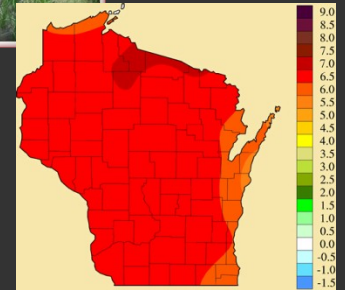
Cultural Practice



Key Species



Place-based and Scientific Evidence



*Projected change in Wisconsin's
annual average temperatures in
°F, 1980-2055*

*Requires cold water habitats
with high oxygen levels*

Climate models predict up to 95% of brook trout habitat across Wisconsin could be lost if the average annual summer air temperature increased just over 5 ° F.

The G-WOW model is transferable to other locations/cultures

Cultural Practice



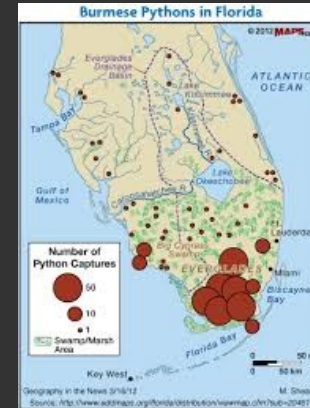
Hiking in the Everglades

Key Species

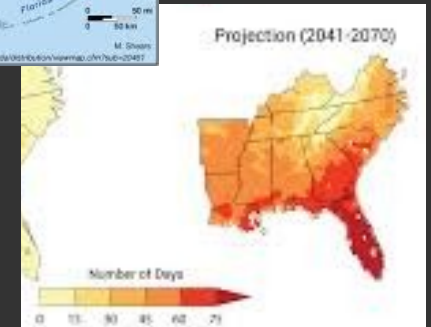


*Invasive Burmese python:
requires very warm,
moist "tropical" habitats*

Place-based & Scientific Evidence



Large circles
= 50 or more
pythons
captured



Increase in 95+
degree day/year,
2041-2070.

What does a changing climate mean for the sustainability of this invasive species? How could this affect recreation, nature-based tourism economies?

G-WOW Model Can Be Used With Economic Practices

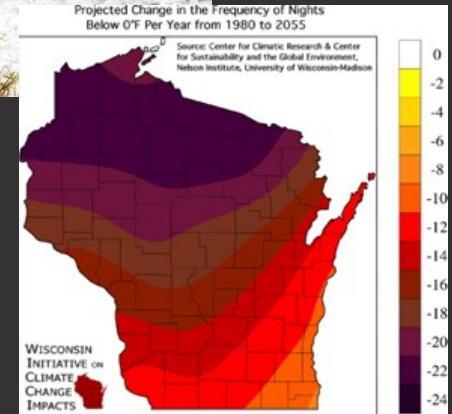
Economic Practice



Key Species/Habitat



Place-based & Scientific Evidence



Projected change in frequency of nights below 0 °F, 1980-2055

Fewer cold nights = less frozen ground affecting harvest & transport of logs to market= \$\$\$???

“38 days of frozen ground lost since 1949. That's only 60 years and we've lost ... five weeks, almost six weeks. What does that mean for forest operations?” Eau Claire, WI Logger

Source: “Shorter winters chip away at northern logging season”, The Daily Climate, 2013

G-WOW also works for “non-species” dependent cultural practices

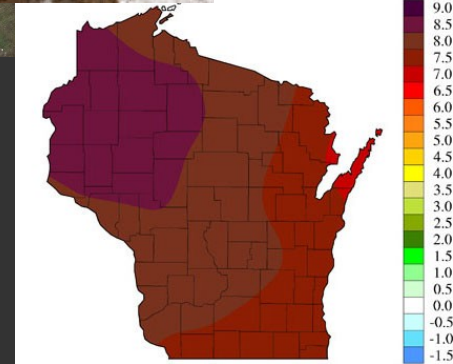
Cultural Practice



Key “habitat”



Place-based and Scientific Evidence



*Projected change in Wisconsin's
winter average temperatures in
°F, 1980-2055*

**What do these changes mean for
species, businesses, and cultural
practices that depend on cold and
snow?**

The BIG “SO WHAT”... WHAT CAN WE DO?

The G-WOW model increases awareness of climate change and promotes personal action by providing:

- A template for customizing a service learning climate response based on culture, personal interests and leadership style
- Examples of actual service learning projects that have been done by G-WOW users
- Ready-made culture and climate service learning opportunities that integrate TEK and science (Project Budburst: G-WOW Community <http://budburst.org/partner/g-wow>)
- Project ideas via links and resources from state and federal websites that include climate service learning projects



Effectiveness of G-WOW Model

Based on survey of educators who attended the 2015 G-WOW Institute and trained in using the G-WOW model

- Agree to strongly agree in an increase in personal climate literacy and skills for teaching about climate change
- Agree to strongly agree in being more confident in teaching about climate change using the G-WOW model
- Agree that the model is transferable to their student populations despite location
- All respondents use the G-WOW model in some form

*Source: Patty Carpenter, 2016 UMD Master Degree Thesis:
“G-WOW Changing Climate, Changing Culture Professional Development's
Influence on Classroom Teachers”*

How Was This Project Funded?

The first application of the G-WOW model:
a 200 sq. ft. climate change exhibit at the Northern Great Lakes Visitor Center in Ashland, WI dedicated in 2010

Exhibit focus: Integrating TEK and place-based evidence with western science to evaluate climate impacts on sustainability of manoomin; climate impacts to other cultures; fighting climate change with change



All are welcome!
Seasons of the Anishinaabe and Climatic Change


On the 11th day of binaakwii-giizis (falling leaves moon or October), when the moon is full, come celebrate the completion of the new "Changing Climate...Changing Culture" exhibit at the Northern Great Lakes Visitors Center in Ashland, WI.

The exhibit features the potential impact of climate change on manoomin (wild rice), a food long valued by the Ojibwe.

4:00-5:00 Open House
5:00-5:30 Brief Program
5:30-6:30 Pipe and Water Ceremonies
6:30-7:30 Potluck Feast
Feast foods will be provided, but please bring a cultural or favorite dish to share, plus a dish bundle (a plate, cup, and utensils)
7:30-8:30 Drum Songs/Dancing

For more information, call the Great Lakes Indian Fish and Wildlife Commission at 715.682.6619.

Exhibit partners include: the US Forest Service, the National Park Service, UW-Extension, Wisconsin Historical Society, and the Great Lakes Indian Fish & Wildlife Commission. Funding provided by the Great Lakes Restoration Initiative and the Wisconsin Coastal Management Program.



Funded through a Great Lakes Restoration Grant and Wisconsin Coastal Management-NOAA grants

G-WOW Outreach Tools

Web Curriculum

www.g-wow.org



**Experiential
learning**

**Ojibwe
language,
TEK, and
cultural
elements
infused**

**Multi-
cultural
perspective
s**

**Climate Change
Discovery Center**

**Professional
Development
Institutes, Field
Courses, and
Climate “Camps”**

G-WOW Changing Climate, Changing Culture Discovery Center

Northern Great Lakes Visitor Center, Ashland WI



**Major teaching exhibit, interactive kiosk, outdoor
activities**

Guided learning programs & "Climate Camps" available

Viewed by approx. 30,000 visitors annually

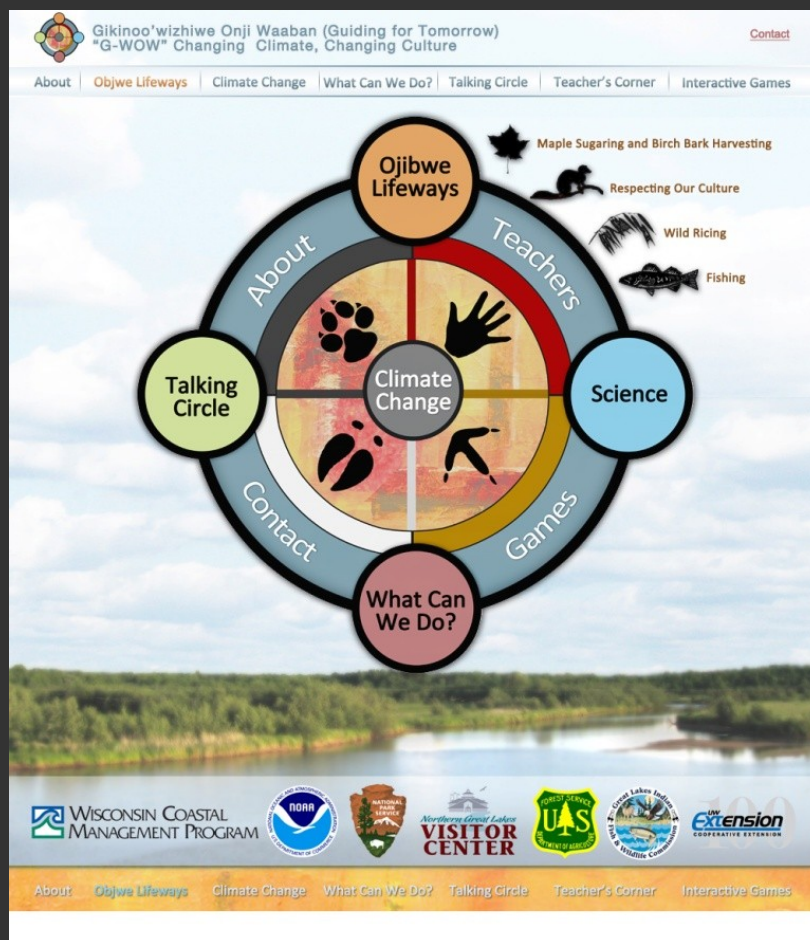
Interactive kiosk added through a WI Coastal Management Grant-
NOAA

Talking Circle

Sharing service learning projects via an interactive blog

What Can We Do?

Taking action through climate service learning projects



Ojibwe Lifeways

Place-based evidence of climate impacts on the sustainability of key species supporting a seasonal Ojibwe cultural practices

NEW:

“Hear the Water Speak” unit

Website remodel

Investigate the Science

Climate science from federal, state, and tribal sources

G-WOW Service Learning Curriculum www.g-wow.org

Initially funded through a WI Coastal Management Grant-NOAA
2018 upgrades funded by Great Lakes Restoration Grant



G-WOW Institutes, Field Courses, and Youth Climate Camps

Experiential learning based on the G-WOW model for educator and youth audiences

Location: Northern Great Lakes Visitor Center-Ashland, WI and the Apostle Island National Lakeshore, and Ojibwe tribal communities

G-WOW Institutes initially funded through National Parks Climate Challenge grants,
additional funding from Wisconsin Coastal Management Program-NOAA

G-WOW Continues to Evolve and Grow

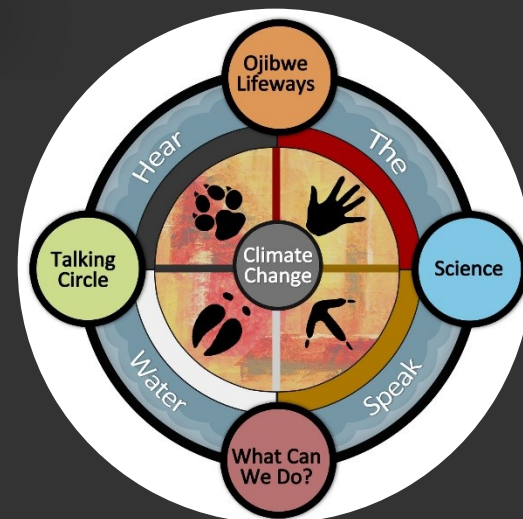
New “Hear the Water Speak” unit added to G-WOW online curriculum

Upgrade and remodeling of G-WOW website for better functionality

New video: “Changing Climate, Changing Culture-Creating a Climate Institute Based on the G-WOW Model”

G-WOW model is the basis for upcoming 2018 field courses, youth climate camps on Ojibwe culture & ecology

G-WOW is included in the Fond du Lac Tribal and Community College’s “Climate Strong! –Building Tribal Youth Leadership for Climate Resiliency NOAA grant application



PROGRAM PARTNERS



Great Lakes Indian Fish and Wildlife Commission

TEK and language expertise, integrated with western science

Climate change impacts on Treaty Rights

GLIFWC research on key species of cultural importance

Program support for G-WOW climate institutes and field courses



University of Wisconsin-Extension



Overall project coordination, grant administration & outreach

Coordination with Wisconsin Initiative on Climate Change Impacts and NASA as sources for western climate science

G-WOW curriculum design

Directing G-WOW professional development climate institutes, field courses, and youth climate “camps” with partners

Project updates in coordination with partners

Expanding G-WOW project partnerships and outreach



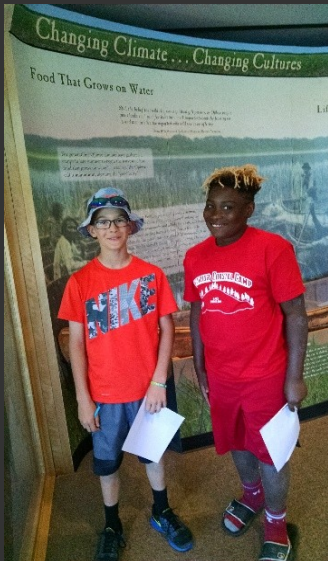


US Forest Service Northern Great Lakes Visitor Center Ashland WI



Hosting the G-WOW exhibit, climate institutes and youth climate “camps”

Taking Action Demonstration Project: Creating “CO2 neutral” buildings and new Energy Exhibit that coordinates with G-WOW exhibit



National Park Service-Apostle Islands National Lakeshore



**G-WOW model development &
curriculum support**

G-WOW exhibit fabrication support

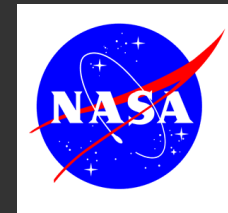
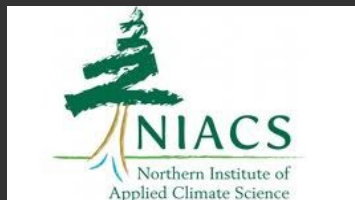
**Providing TEK, administrative, and
interpretive expertise for G-WOW
climate institutes and field courses**

**Grant funded support for new “Hear the
Water Speak” G-WOW curriculum unit
and professional development training
video**



National Park Foundation grants supported first 3 years of G-WOW professional development climate institutes

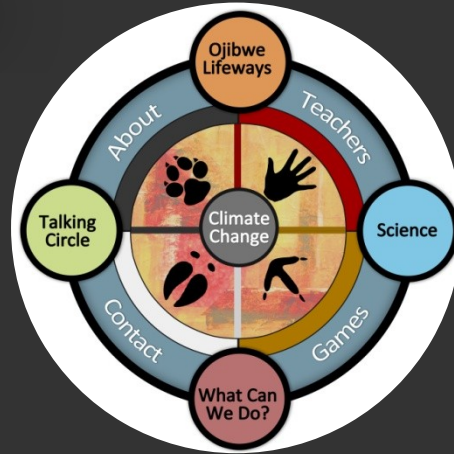
Collaboration between Indigenous and Western Science partners



- Challenges and how were they overcome
- Lessons learned
- What can be applied to other projects/efforts

The Ojibwe believe that we must think seven generations ahead when making decisions today. All cultures share responsibility for protecting their home, the Earth. We cannot eliminate all the risks that climate change presents, but we can make a difference in slowing its impacts. The culture and lifeways of future generations will be affected by the choices we make.

Quotation by Bad River Elder Joe Rose, posted on the G-WOW exhibit



Miigwech!
(Thank
you)

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