

# Phenology Across Minnesota

Sharing phenological events from my place to yours. Native science and phenology across Minnesota.

# **Our Essential Question**

How can our students use place based data collection, observation, and story sharing to interpret natural events from the perspectives of both Indigenous and Western Science?

# Our Places



## Potential Shared Events:

- Ice in on local lake
- Ice out on local lake
- Sugar maple: bud to full leaf, including sap
- Wild rice gathering and processing
- Blueberry picking
- Mississippi River



# Data Sharing

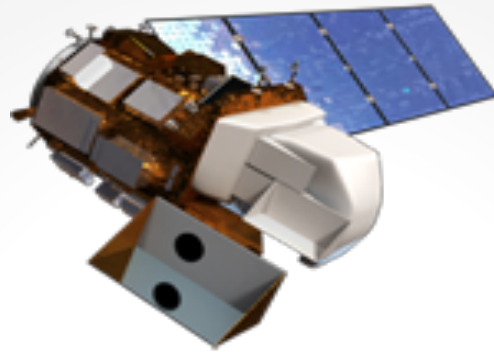
Nature's Notebook - MN Phenology Network

Project Bud Burst

Google Earth using Landsat data

Skype





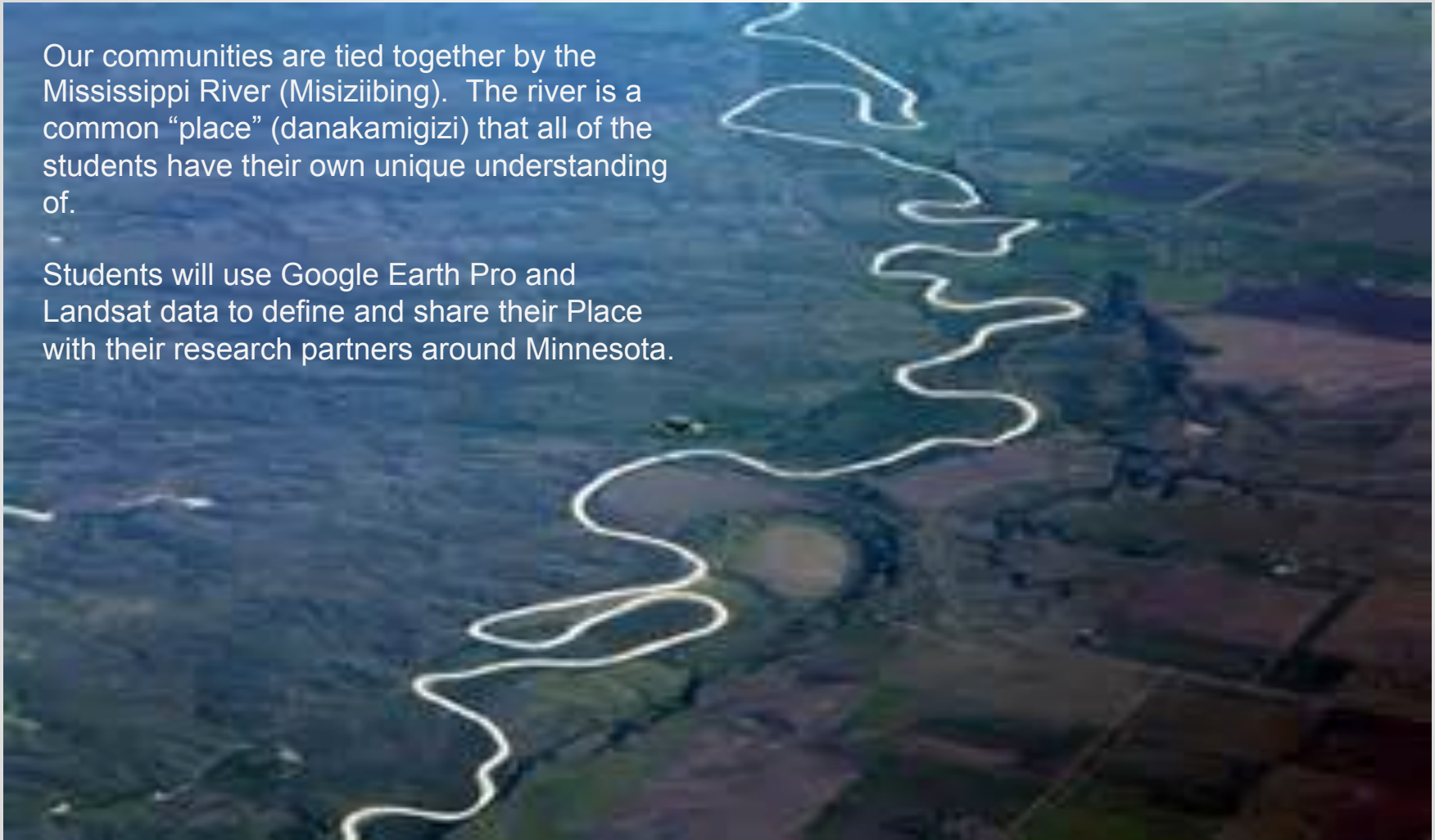
# What is Landsat

[https://www.youtube.com/watch?  
v=BPbHDKgBBxA](https://www.youtube.com/watch?v=BPbHDKgBBxA)



Our communities are tied together by the Mississippi River (Misiziibing). The river is a common “place” (danakamigizi) that all of the students have their own unique understanding of.

Students will use Google Earth Pro and Landsat data to define and share their Place with their research partners around Minnesota.



# Phenology Defined

The relation between climate and periodic biological phenomena.

For example: Birds migrating or flowers blooming

In Ojibwemowin: azhigwa (at this time)





# Seasons

Months of the year are often named by many Indigenous tribes for the activities that took place during that time. In a sense, this is a type of verbal phenology in the oral traditions. For the Ojibwe of Minnesota the changes in the natural world that take place with the changes of the seasons were closely observed and signified the time to move or take action.

Students of all cultures are encouraged to share the seasonal traditions and words associated with their own cultural teachings as they pertain to the environment and personal observations.

# Fall - Dagwaagin

September - Waatebaagaa-giizis  
(Leaves Turning Color Moon)

October - Binaakwe-giizis  
(Leaves Falling Moon)

November - Gashkadino-giizis  
(Freezing Over Moon)



In each season, the research partners will compare specific events in their own area and share their observations with the students in the other parts of the state.

This will provide a framework for presenting Western Science and Native Science in ways that are most effective for our students.

<http://www.youtube.com/watch?v=2B5nP21eq-k?hd=1&autoplay=1>

<https://www.youtube.com/watch?v=rIKKPQH8vj4>

# Winter - Biboon

December - Manidoo-giizisoons  
(Little Spirit Moon)

January - Gichi-manidoo-giizis  
(Great Spirit Moon)

February - Namebini-giizis  
(Sucker Fish Moon)



# Spring - Ziigwan

March - Onaabani-giizis (Crust on Snow Moon)

April - Iskigamizige-giizis (Sap Boiling Moon)

May - Zaagibaa-giizis (Budding Moon)





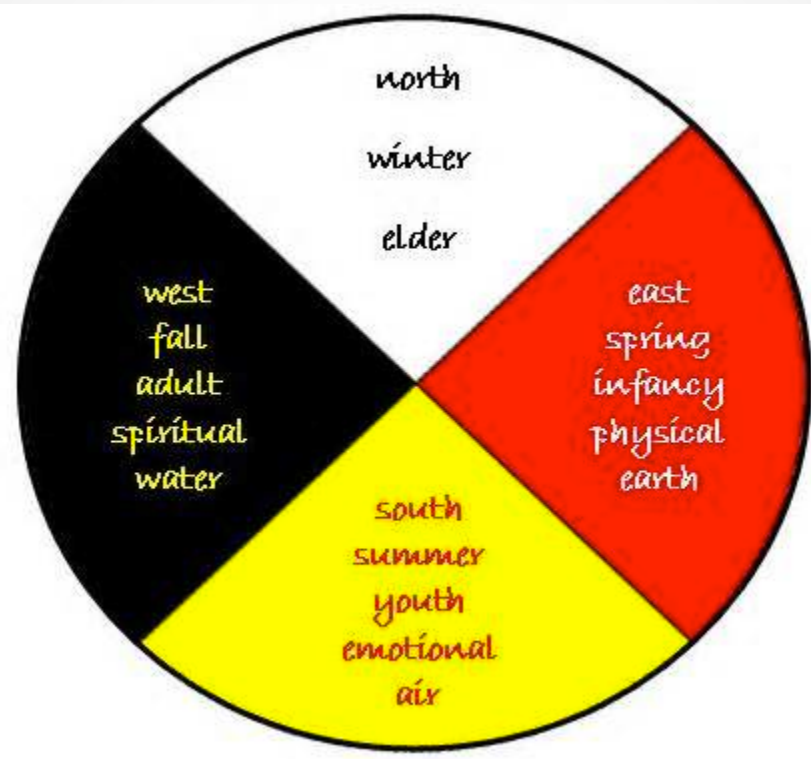


## **Summer - Niibin**

June - Ode'mini-giizis  
(Strawberry Moon)

July - Miini-giizis  
(Blueberry Moon)

August - Manoominike-giizis  
(Ricing Moon)



# Minnesota State Standards

5.1.3.2.1 Describe how science and engineering are influenced by local traditions and beliefs.

5.1.3.4.2 Create and analyze different kinds of maps of the students' communities and of Minnesota.

9.1.1.1.2 Science is a way of knowing about the natural world and is characterized by empirical criteria, logical argument and skeptical review.

9.1.3.2.1 2. Men and women throughout the history of all cultures, including Minnesota American Indian tribes and communities, have been involved in engineering design and scientific inquiry.

9.4.4.1.3 1. Human activity has consequences on living organisms and ecosystems.

# Additional Resources

G-WOW  Gikinoow'wizhiwe Onji Waaban (Guiding for Tomorrow)  
"G-WOW" Changing Climate, Changing Culture  
<http://www.g-wow.org/en-us/default.aspx>

Jeffer's Foundation  
<http://www.jeffersfoundation.org>

