



Preserving our Roots: The Challenge of Climate Change to Menominee Forest Management

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Introduction

Who are the Menominee and why does their methods of forest management matter?

The Menominee Tribe of Wisconsin once referred to themselves as “Kiash Matchitiwuk” meaning “The Ancient Ones” and now refer to themselves as Wild Rice People. The Menominee are indigenous to Wisconsin and every variation of their creation story takes place at the mouth of the Menominee River, nearly sixty miles from their present reservation (Fig. 6). The forest that rests upon their reservation is an integral part of Menominee identity. In fact, they refer to themselves as people of the forest. The forest is the lifeblood of the people; providing medicine, food, and spiritual interactions with their environment.

The Menominee People are known for their lumber industry and their unique as well as successful forestry management practices. Since the Reservation era in 1854, the Menominee Tribe of Wisconsin have managed the forest and its resources. As of today the Menominee Reservation encompasses approximately 234,000 acres of lands, with over 200,000 acres of that being delegated as hard-wood forests. The Menominee Tribal Enterprises (MTE), is the tribal entity that manages the forest on behalf of the community since the Restoration era. Currently, MTE forest inventory reports indicate there is more standing saw timber within the forest now than in the 1800s. Having harvested 2.25 billion board feet since the 1850s, there is now 1.7 billion board feet as compared to 1.2 billion board feet in 1854.

Menominee Forest Management

“Start with the rising sun and work toward the setting sun, but take only the mature trees, the sick trees, and the trees that have fallen. When you reach the end of the reservation, turn and cut from the setting sun to the rising sun and the trees will last forever”
– Chief Oshkosh

How do the Menominee currently manage their forest?

The Menominee Tribal Enterprises harvest and manage their forest through the practice of Silviculture and describe it as “*Silviculture* is the art and science of controlling the establishment, growth, composition, health, and quality of forests to meet the goals and strategies. A *silvicultural prescription* is a written document that describes the objectives of the harvest treatment and the manner in which it will be carried out. A *silvicultural system* is the specific technique, based on practical experience and scientific research, used to modify the stand to meet the objectives of the prescription. Some of the key considerations in the selection of a silvicultural system include Shade Tolerance, Age Distribution, Stand Structure, and Stand Condition. The two broad categories of management that apply to silviculture include even-aged and uneven-aged management¹.”

Aside from silvicultural harvesting practices, the Menominee Reservation focuses not only on the harvesting and care of trees but on the management of the entire ecosystem of their forest (fig. 6). Their current forest management encapsulates¹:

- The developing of harvest schedules to ensure species composition diversity
- The incorporation of further refined silvicultural practices
- Producing further forest tree species diversity
- The use of fire and traditional treatments
- Water quality incorporation
- Wildlife habitat management
- Soil preservation



“Logging Transportation down the Wolf River.” Photo Credits to Dennis Howard 1898.

Increasing Temperature Effects

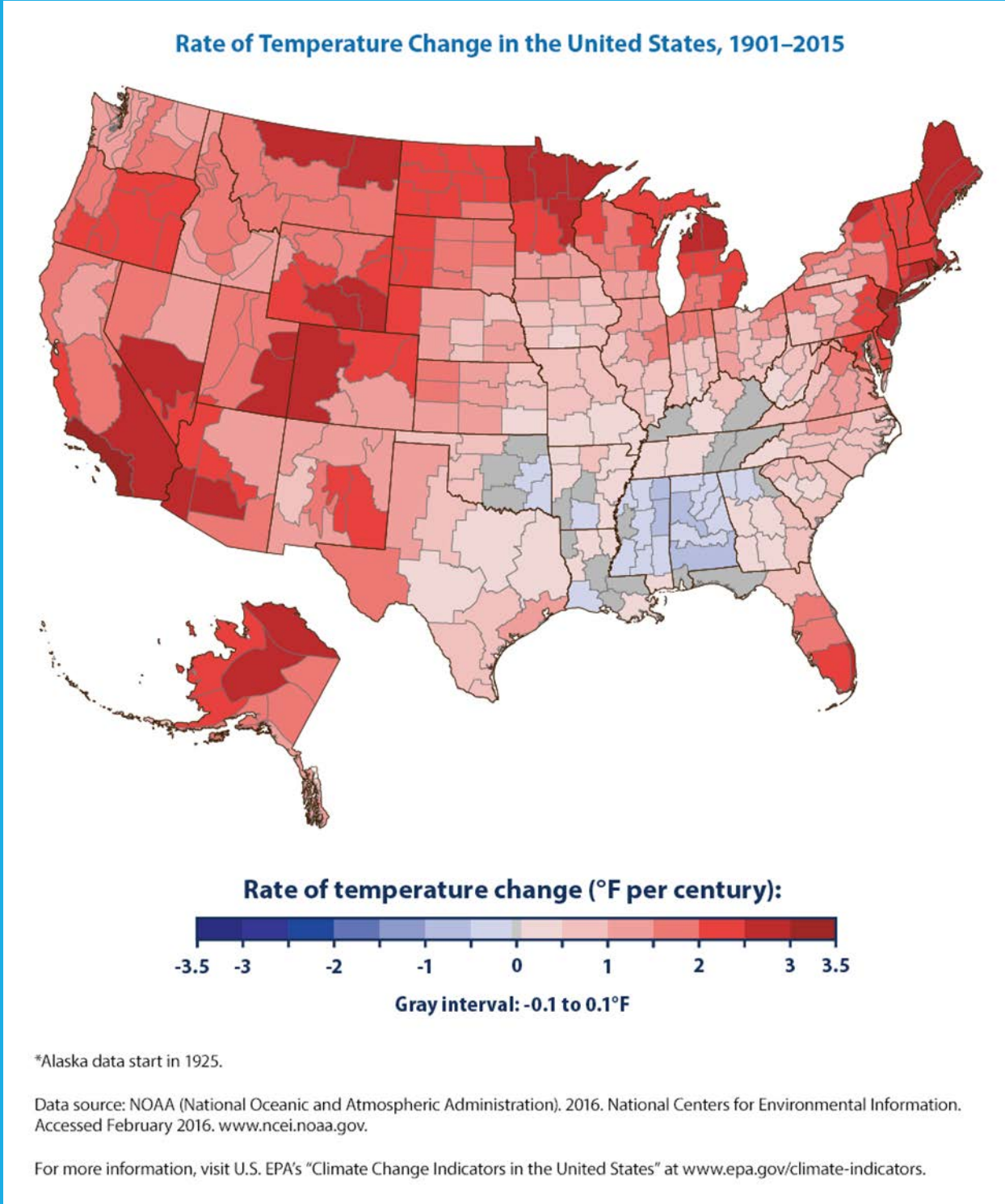


Figure 1: How annual average air temperatures have changed in the United States from 1901-2015.

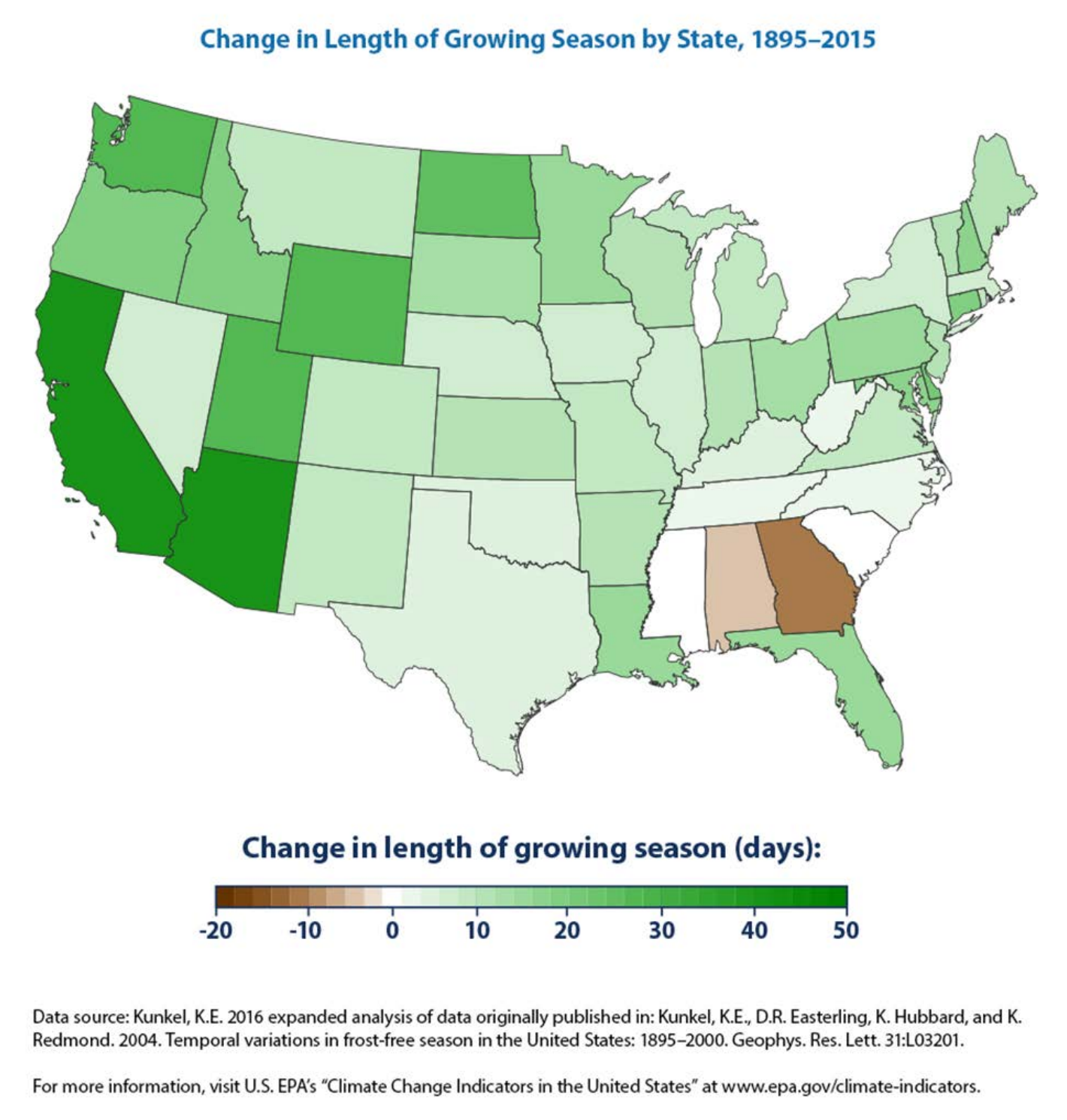


Figure 2: Change in length of growing seasons throughout the United States from 1895-2015.

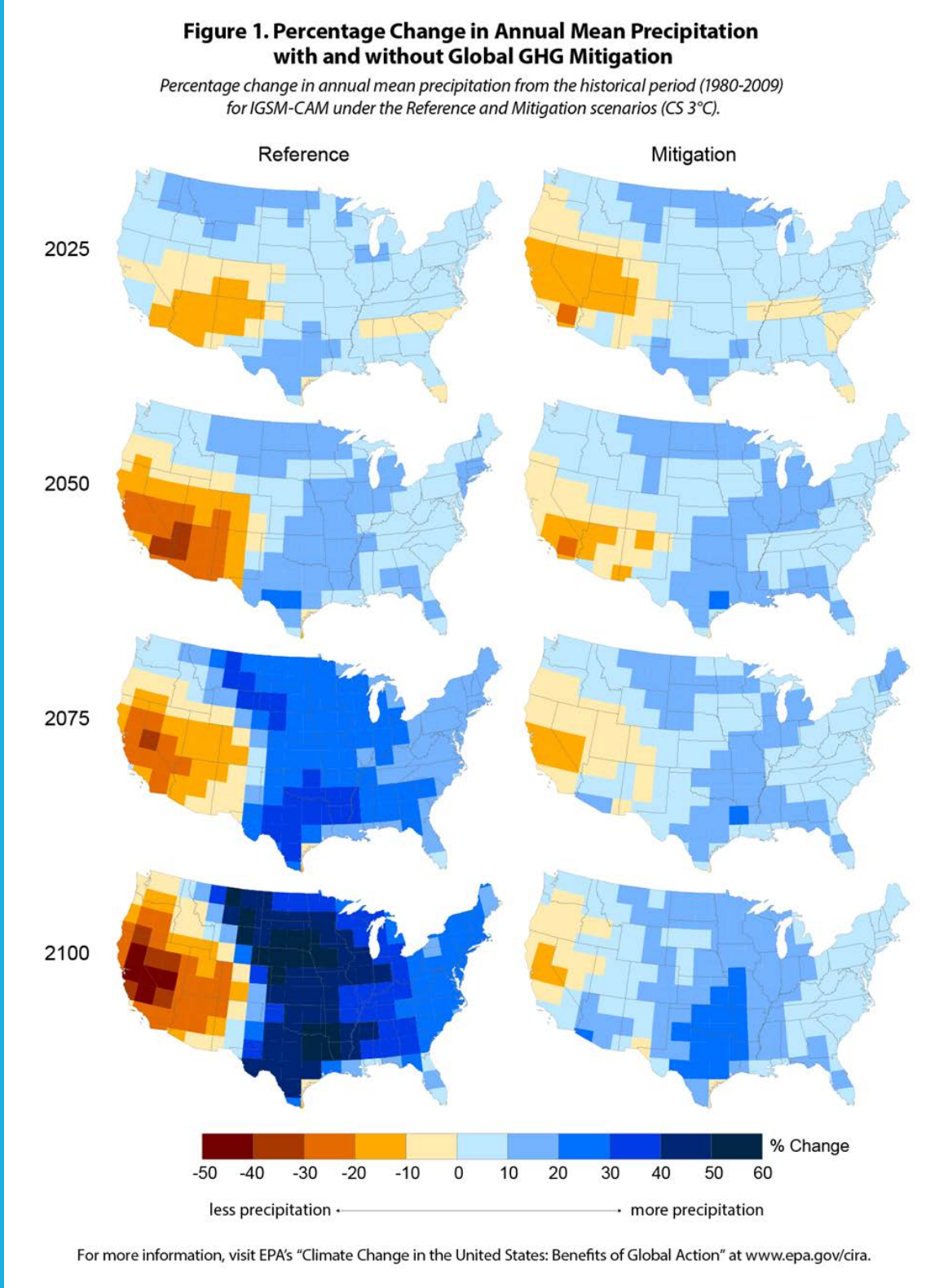


Figure 3: Projected percent change in annual mean precipitation across the United States with and without greenhouse gas mitigation.

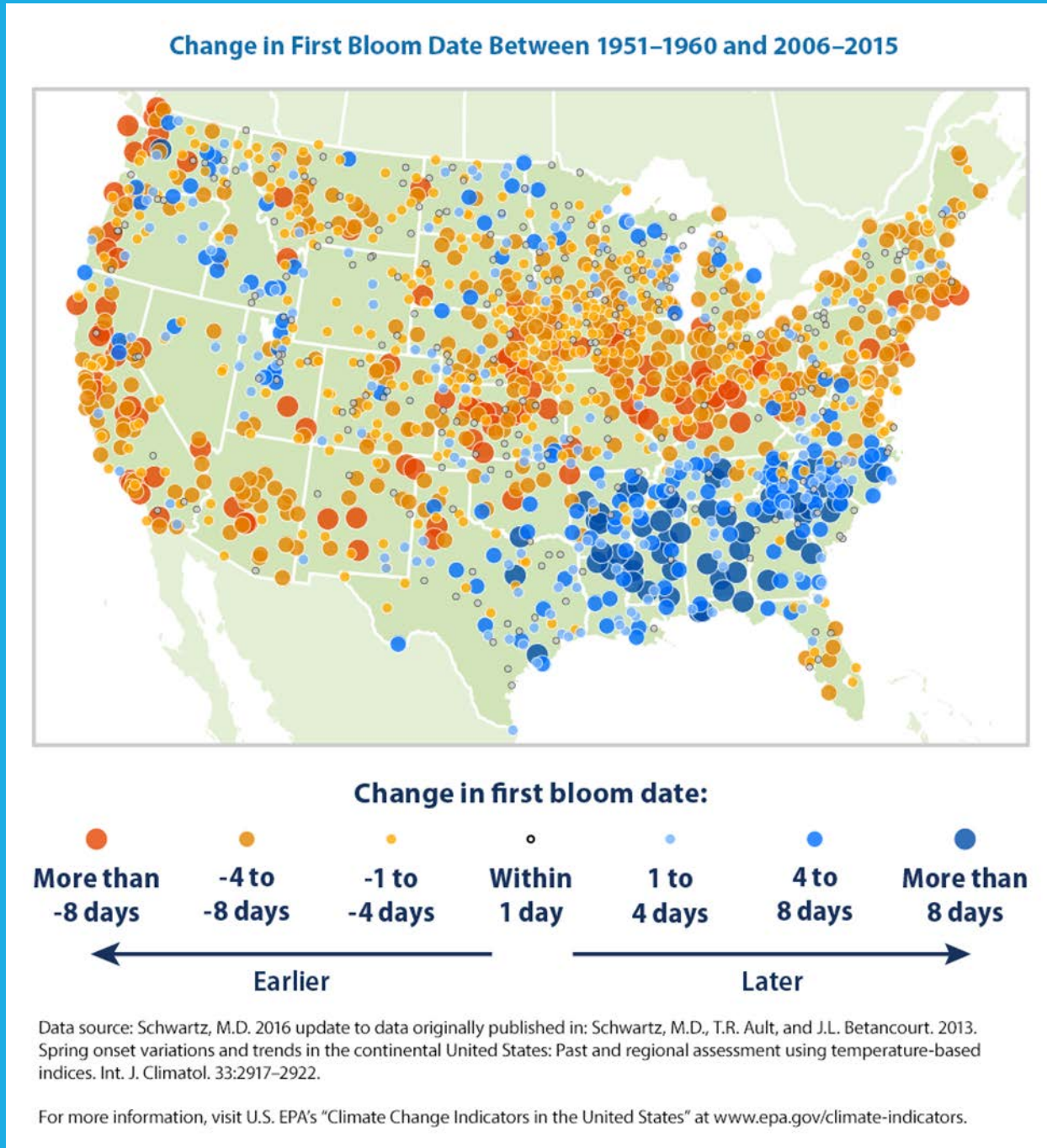


Figure 4: Model trends in lilac and honeysuckle first bloom dates at weather stations across the contiguous 48 states.

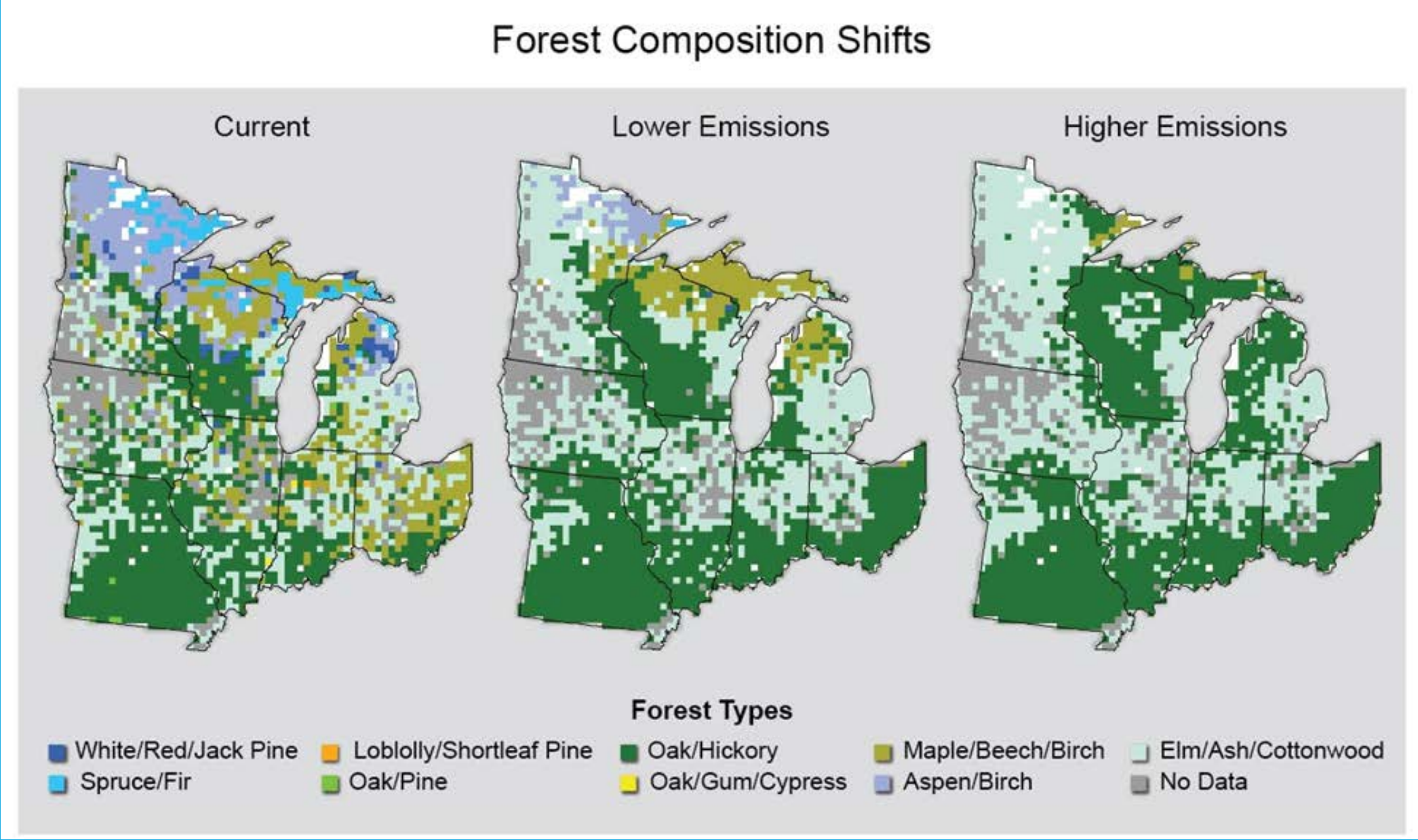


Figure 5: “Projected species range distribution in response to change in heat-trapping gas emissions in the Midwest.. Habitats for white/red/jack pine, maple/beech/birch, spruce/fir, and aspen/birch forests are projected to greatly decline from the northern forests, while various oak forest types are projected to expand.” (Figure source: Prasad et al. 2007)

Analysis

How is increasing temperatures induced from Climate Change affecting the Menominee Reservation Forest?

State-wide lilac and honeysuckle have bloom dates that begin four to more than eight days earlier than average (Fig. 4). The lilac and honeysuckle measurements are indicative of surrounding plant species bloom dates as well. Earlier leaf dates affect the surrounding ecosystem by altering the feeding habits of folivorous and palynivorous animal species. Increased bloom date and growing season induced by a higher average annual temperature can also affect the quality of tree species and their product higher precipitation percentage and higher temperature causing more cottonwood-like species. Wisconsin has had a rise in temperature of 1-3° Fahrenheit within the past century (Fig. 1). The reservation area (Fig. 6) has had a rise in temperature of 2-2.5° Fahrenheit since 1901 (Fig. 1). The rise in temperature can be attributed to rising carbon dioxide levels. In the projection of current, lower, and higher emissions, the general tree species distribution heads north. With higher emissions there are almost no distributions of white/red/jack pine, spruce/fir, or maple/beech/birch. In contrast, there are larger distributions of elm/ash/cottonwood, and oak/hickory. The precipitation within the United States is projected with and without mitigation for the next century. It is projected to rise greatly within the Great Lakes area by 30% more precipitation by 2100 without mitigation (Fig. 3).

Future Forest Management

What do the Menominee plan to do in order to meet these new climate challenges?

The tribe recognizes that emerging invasive species and a changing climate require new approaches to forest management and technology¹. The Menominee, with their tribally based counter parts: the Land Conservation Committee and the Environmental Services Department will continue to focus on overall forest biodiversity. Their Forest Management Plan contains forest-wide goals that include:

- biological controls effective against invasive species
- new management methods for their current timber types
- Improvements in data management technology
- renewable biomass harvesting

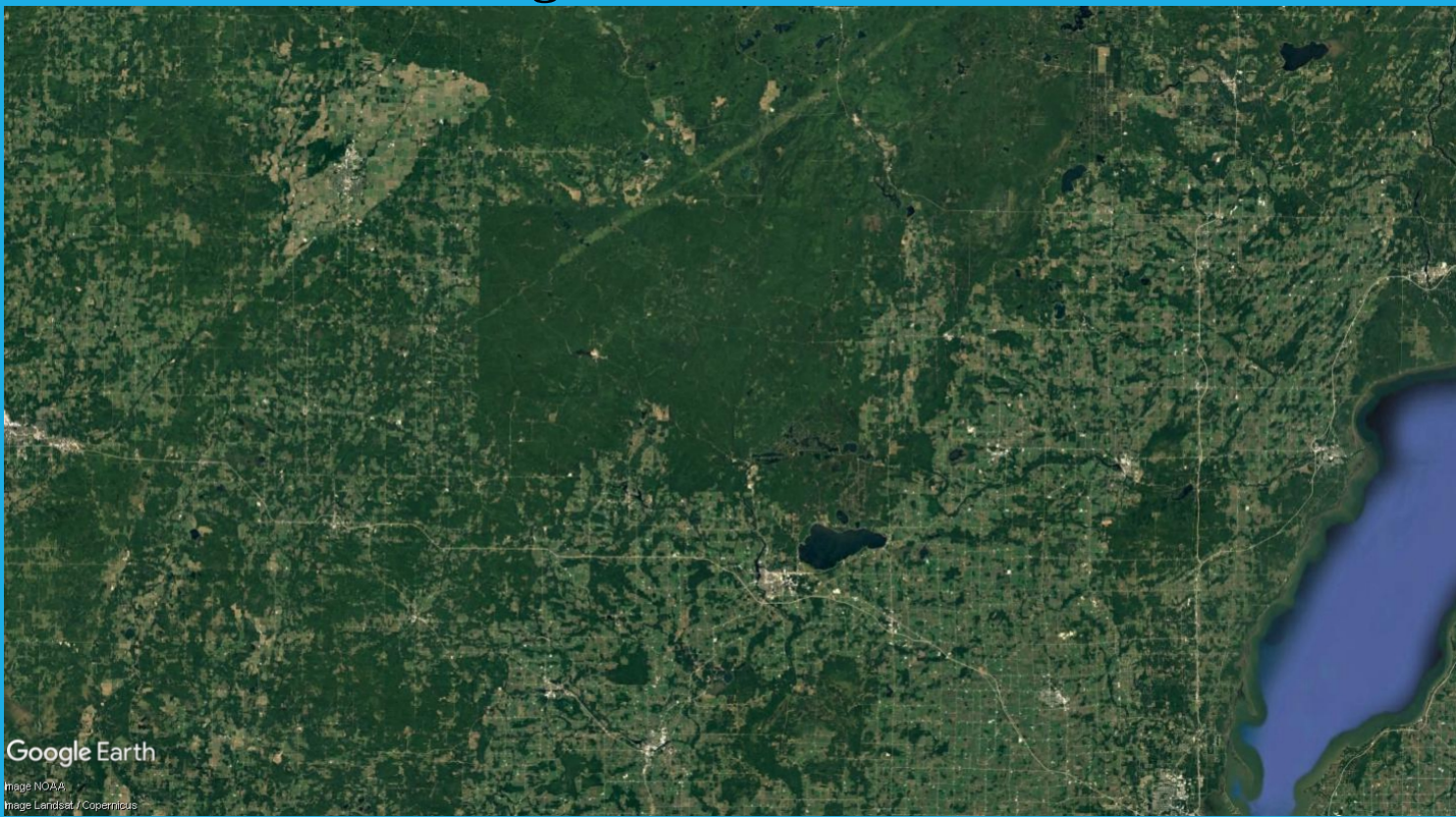


Figure 6: Menominee reservation outline. (Keshena, WI)

Conclusions

Increasing temperature alongside elevated carbon dioxide levels will bring longer growing seasons and earlier bloom dates to the state of Wisconsin and the Menominee Reservation. These factors will change the forest species composition of the reservation forest, affect the quality and health of the hardwood, and bring about other forest management issues that need to be met and either adapted or mitigated. Traditional commercial harvesting does not take into account environmental variables. Western harvesting is written in such a spearheaded-forward manner that short life hardwood is grown at a focus and dealt with in a clear-cut manner, the soil is not remediated, and the wildlife is not directly taken into account. In comparison, the Indigenous forest management plans throughout the nation take into account the need for ambiguity. Such ambiguity within their plans allow for operational flexibility in the face of a sudden environmental variable. The future of the state of the Menominee Reservation Forest rests upon the entire community. The Menominee Tribal Enterprises and the Reservation Legislatures work in accordance with the community and hear their questions, comments, and concerns. This results in modifications and guidance to the foresters when they work together on their management plans. The Menominee Tribal Enterprises also takes the spiritual aspects of forest management into consideration throughout their planning process. Their Tribal Historic Preservation Officer is allowed input into every management activity in terms of cultural significance of affected areas. The Menominee believe the continuation of their forest diversity is in one way the forest management preserves that spiritual connection. The Menominee also take into account the surrounding wildlife when harvesting and managing their forest. Many parts of the harvest prescriptions are thought of with local wildlife habitats and water quality taken into account. When practicing their forest management, the Menominee do not think of the revenue, they think of the future. (See logo below).



The Original Menominee Tribal Enterprises logo. (“Menominee Tribal Enterprises Forest Management Plan (Revised 1973) 2012-2027” 2012, 16).

References

- ¹“Menominee Tribal Enterprises Forest Management Plan (Revised 1973) 2012-2027.” 2012. Neopit, WI: Menominee Tribal Enterprises: Menominee Tribal Enterprises.
- ²Menominee Indian Tribe of Wisconsin, Department of Administration, and Community Resource Planner - Brian Kowalkowski. 2004. *Menominee Indian Tribe of Wisconsin Facts and Figures Reference Book*.
- ³Assessment of High Conservation Value Areas on the Menominee Indian Reservation.” n.d. Neopit, WI: Menominee Tribal Enterprises: Menominee Tribal Enterprises. Accessed June 6, 2018.
- ⁴Mausel, David L., Anthony Waupochick, and Marshall Pecore. 2017. Menominee Forestry: Past, Present, Future.” *Journal of Forestry* 115 (5): 366–69.
- ⁵Dockry, Michael J. 2012. “Indigenous Forestry in the Americas: Comparative Environmental Histories in Bolivia and Wisconsin.” PhD, University of Wisconsin-Madison.

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