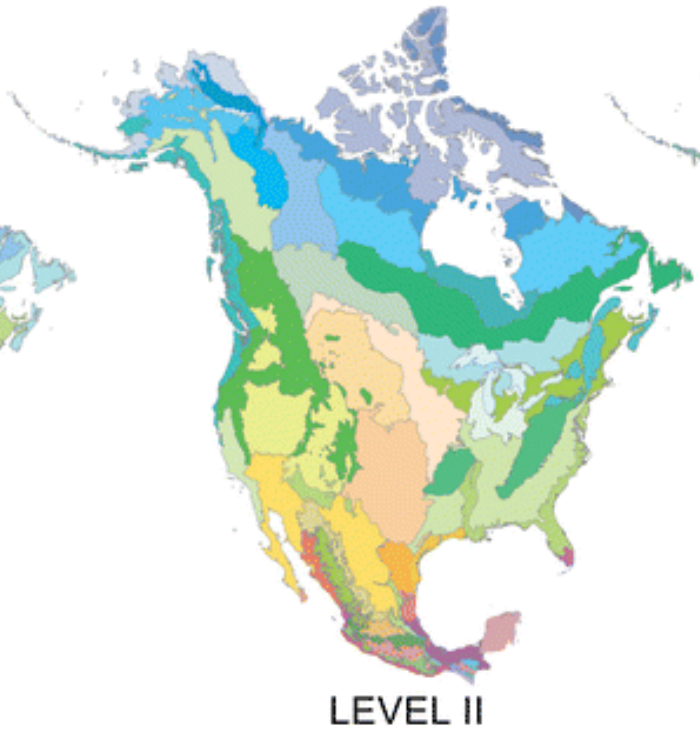
# 1.2: Natural History of the Midwest II

## Brandon Corder, Botany 450 (Summer 2024)


LEVEL I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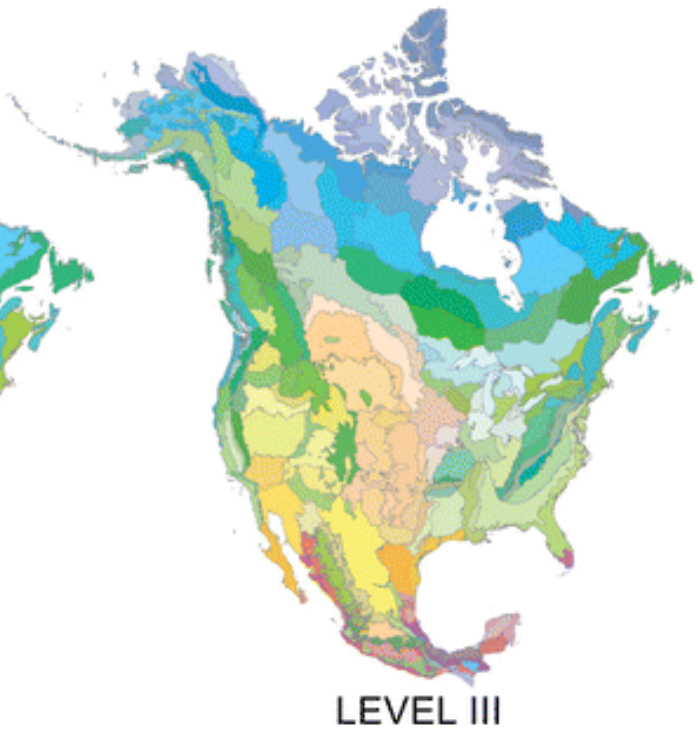
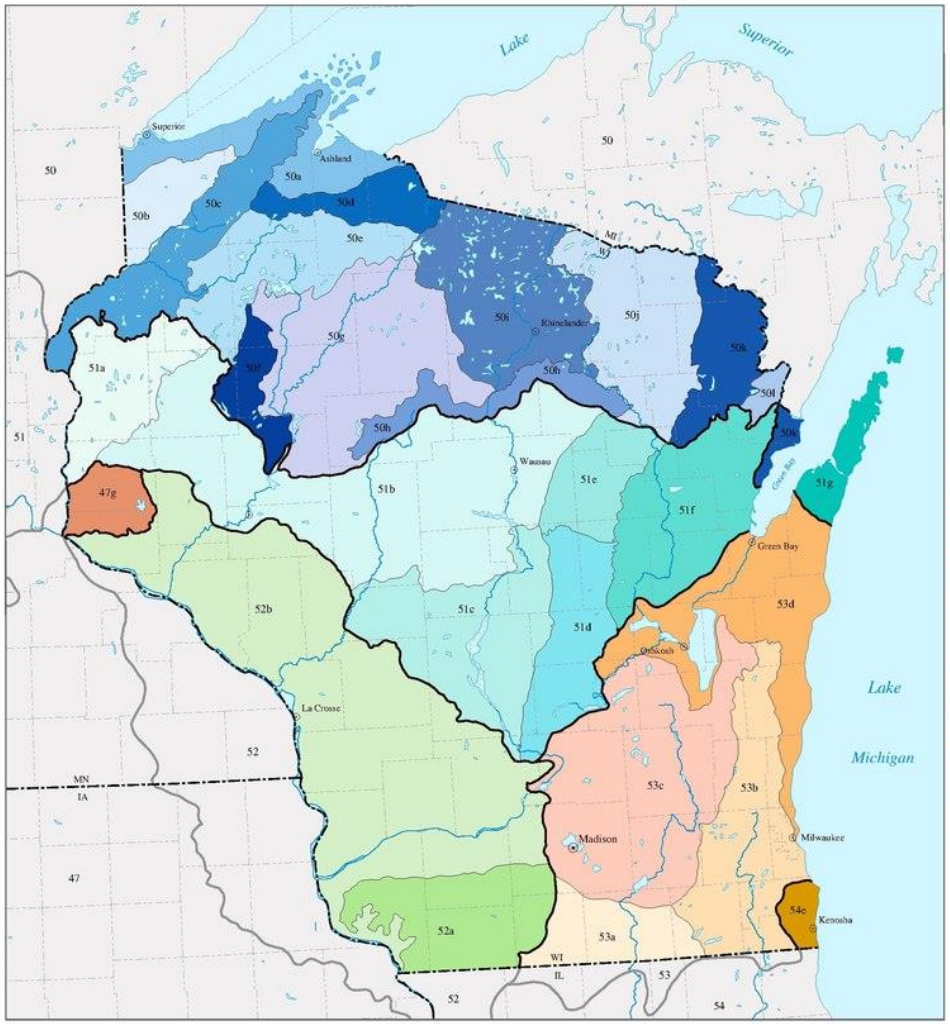

LEVEL III

# EPA eco-regions of Wisconsin

**Level I (3):** Northern Forests, Eastern Temperate Forests, Great Plains
**Level II (4):** Mixed Forest Shield, Mixed Wood Plains, Central USA Plains, Temperate Prairies
**Level III (6):** Western Corn Belt, Northern Lakes and Forests, North Central Hardwood Forests, Driftless Area, Southeastern Wisconsin Till Plains, Central Corn Belt Plains
**Level IV (27):** examples include: Rock River Drift Plain, Coulee section of Driftless, Menominee Ground Moraine, St. Croix Pine Barrens, Prairie Pothole Region, Door Peninsula, etc.

# Level III and IV Ecoregions of Wisconsin




**47 Western Corn Belt Plains**
- 47g Prairie Pothole Region

**50 Northern Lakes and Forests**
- 50a Lake Superior Clay Plain
- 50b Minnesota/Wisconsin Upland Till Plain
- 50c St. Croix Pine Barrens
- 50d Ontonagon Lobe Moraines and Gogebic Iron Range
- 50e Chequamegon Moraine and Outwash Plain
- 50f Blue Hills
- 50g Chippewa Lobe Rocky Ground Moraines
- 50h Perkinstown End Moraine
- 50i Northern Highlands Lakes Country
- 50j Brule and Paint River Drumlins
- 50k Wisconsin/Michigan Pine and Oak Barrens
- 50l Menominee Ground Moraine

**51 North Central Hardwood Forests**
- 51a St. Croix Stagnation Moraines
- 51b Central Wisconsin Undulating Till Plain
- 51c Glacial Lake Wisconsin Sand Plain
- 51d Central Sand Ridges
- 51e Upper Wolf River Stagnation Moraine
- 51f Green Bay Till and Lacustrine Plain
- 51g Door Peninsula

**52 Driftless Area**
- 52a Savanna Section
- 52b Coulee Section

**53 Southeastern Wisconsin Till Plains**
- 53a Rock River Drift Plain
- 53b Kettle Moraines
- 53c Southeastern Wisconsin Savannah and Till Plain
- 53d Lake Michigan Lacustrine Clay Plain

**54 Central Corn Belt Plains**
- 54e Chiwaukee Prairie Region

State boundary
County boundary
Level III ecoregion
Level IV ecoregion

Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources; they are designed to serve as a spatial framework for the research, assessment, monitoring, and management of ecosystems and ecosystem components. Special purpose maps of characteristics such as plant communities, water quality, soils, and fish distributions are necessary and have long been used for dealing with specific research and management problems. Ecoregions, on the other hand, portray areas within which there is similarity in the mosaic of all biotic and abiotic components of both terrestrial and aquatic ecosystems. Recognition, identification, and delineation of these multipurpose regions are critical for structuring and implementing integrated management strategies across federal, state, tribal, and local governmental agencies that are responsible for different types of resources within the same geographical areas.

**An explanation of how and why the map of Ecoregions of Wisconsin was compiled and a list of sources can be found in Omernik, J.M., S.S. Chapman, R.A. Lillie, and R.T. Dumke. 2000. Ecoregions of Wisconsin. Transactions of the Wisconsin Academy of Sciences, Arts, and Letters. 88:77-103**

*Information on electronic coverages of the map is available from Richard A. Lillie, Wisconsin DNR, Bureau of Integrated Science Services Research, 1350 Femrite Dr., Monona, WI 53716 <lillir@dnr.state.wi.us> or James Omernik, USEPA, 200 SW 35th St., Corvallis, OR 97333 <omernik@mail.cor.epa.gov>*

Scale 1:1,500,000

0 20 40 60 80 100 MILES
0 40 80 120 160 200 KILOMETERS

Albers Equal Area Projection

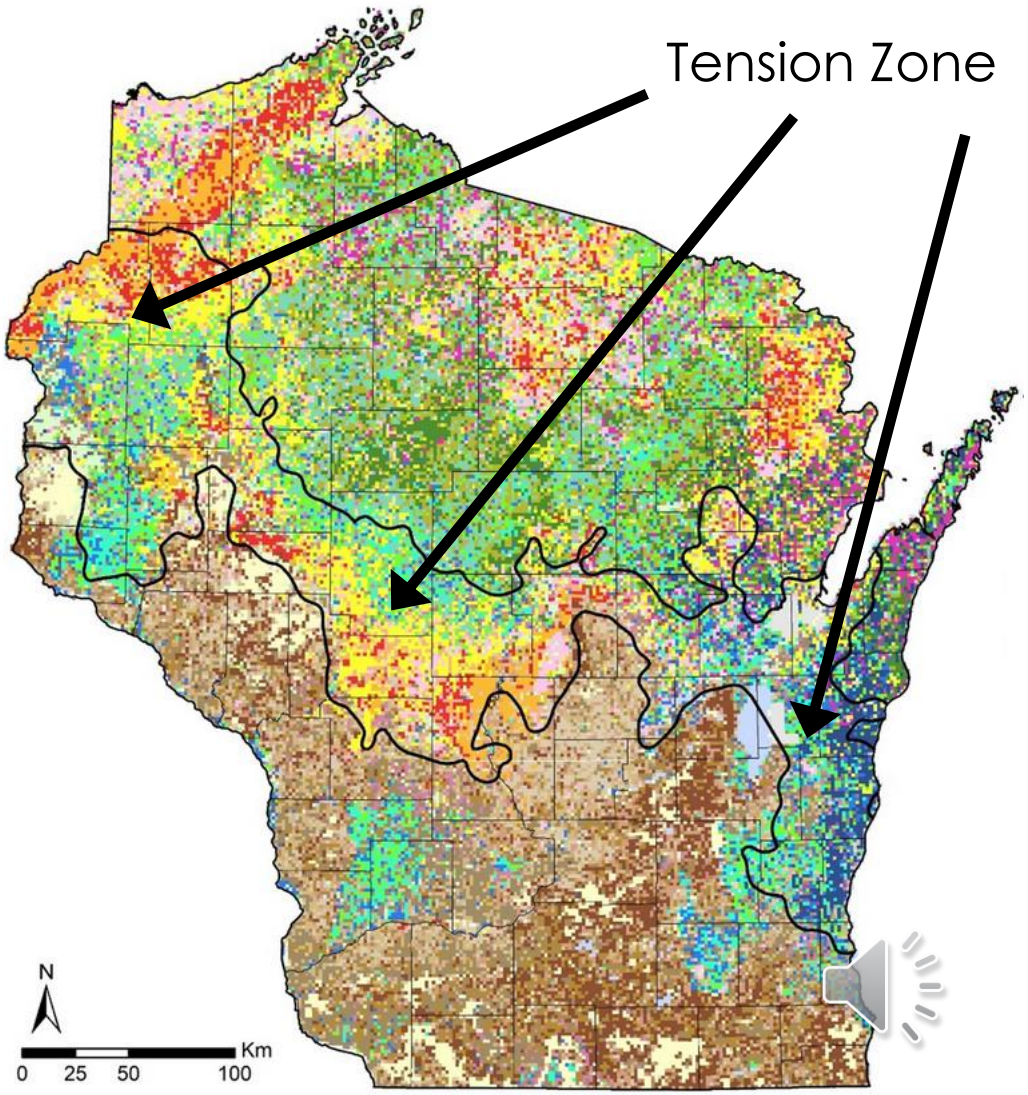

Superior Coastal Plain
Northwest Lowlands
Northwest Sands
North Central Forest
Northern Highland
Northeast Sands
Western Prairie
Forest Transition
Northern Lake Michigan Coastal
Western Coulees and Ridges
Central Sand Plains
Central Lake Michigan Coastal
Central Sand Hills
Southeast Glacial Plains
Southern Lake Michigan Coastal
Southwest Savanna

# Tension Zone

Combination of climate and soil differences between N & S Wisconsin

Northern soils are leached due to **high precipitation** and **low evaporation**

Generally poorer soils up North



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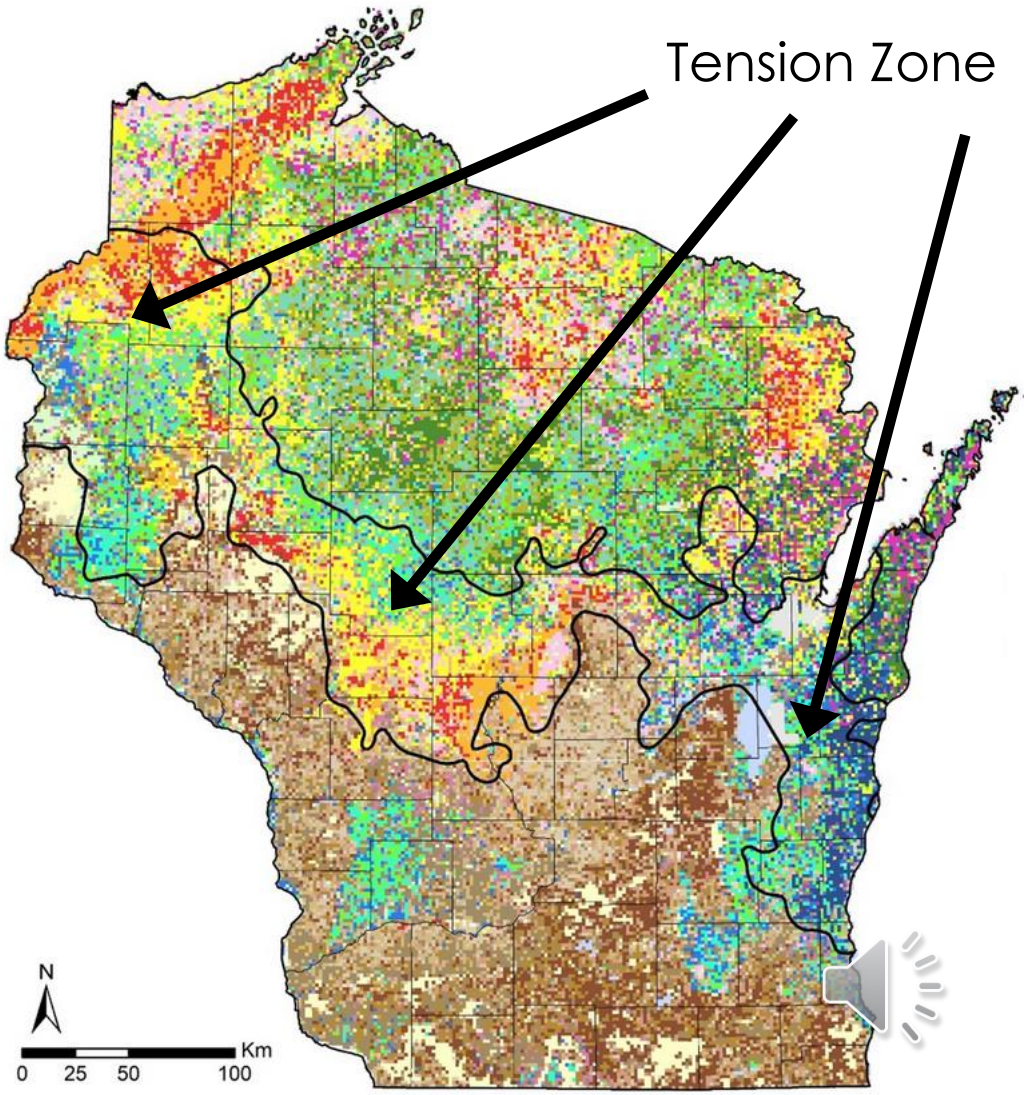
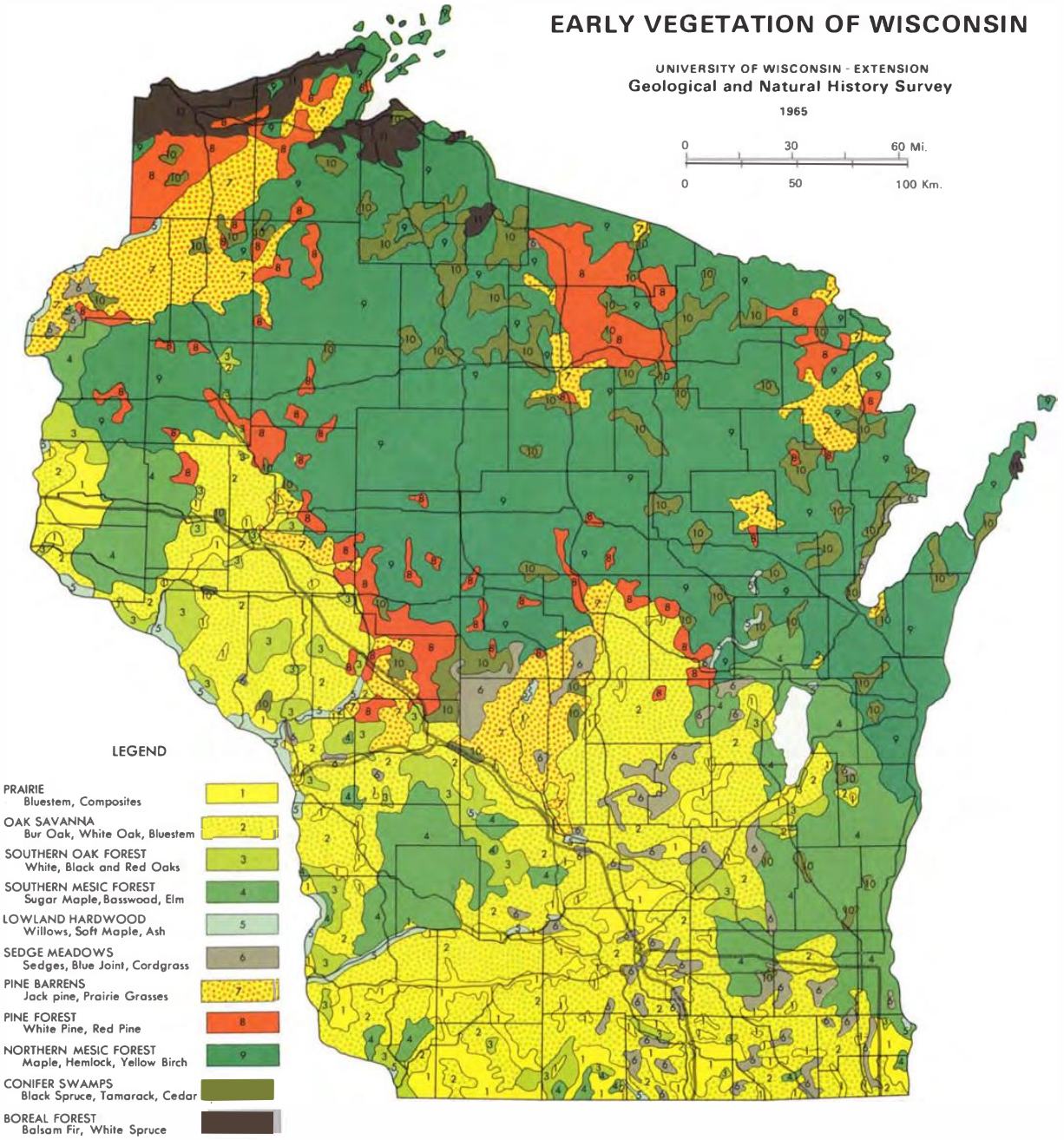
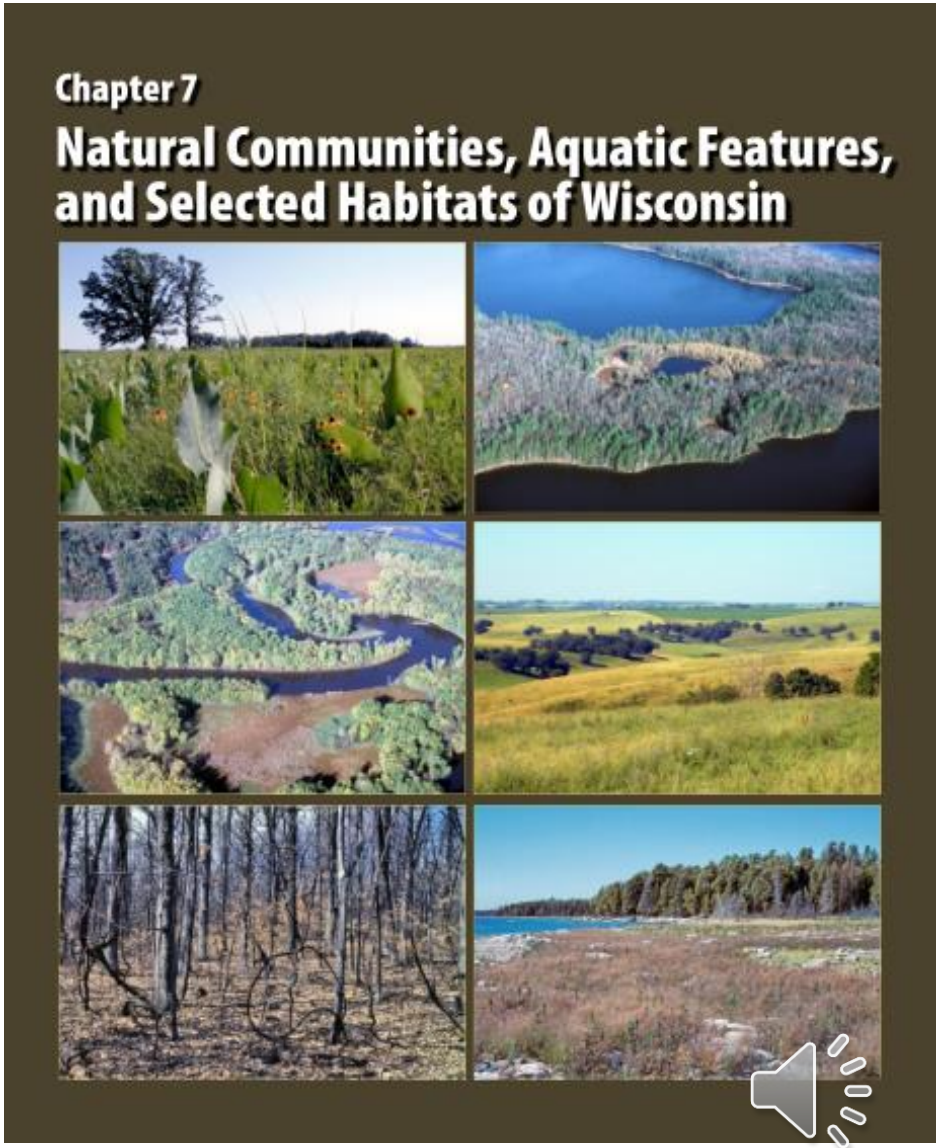



EARLY VEGETATION OF WISCONSIN
UNIVERSITY OF WISCONSIN - EXTENSION
Geological and Natural History Survey
1965
0 30 60 Mi.
0 50 100 Km.
LEGEND
PRAIRIE
Bluestem, Composites
OAK SAVANNA
Bur Oak, White Oak, Bluestem
SOUTHERN OAK FOREST
White, Black and Red Oaks
SOUTHERN MESIC FOREST
Sugar Maple, Basswood, Elm
LOWLAND HARDWOOD
Willows, Soft Maple, Ash
SEDGE MEADOWS
Sedges, Blue Joint, Cordgrass
PINE BARRENS
Jack pine, Prairie Grasses
PINE FOREST
White Pine, Red Pine
NORTHERN MESIC FOREST
Maple, Hemlock, Yellow Birch
CONIFER SWAMPS
Black Spruce, Tamarack, Cedar
BOREAL FOREST
Balsam Fir, White Spruce

Natural Communities of Wisconsin

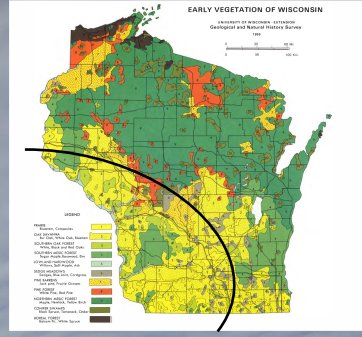
The WI DNR lists at least 71 different natural plant communities (not including lake types



# Prairies

- Prairies are grasslands that lack trees; they are highly diverse and imperiled communities
- DNR today classify prairies in two major ways:

1. Moisture: running from dry to dry-mesic to mesic to wet-mesic to wet
2. Soil type: i.e., distinction between sand prairie and dry prairie




Rich soils
Frequent **fire**
Primarily prairie grasses and forbs (not woody herbs)

Sand Prairie

Dry Prairie

Dry-Mesic Prairie

Mesic Prairie

Wet-Mesic Prairie

Wet Prairie

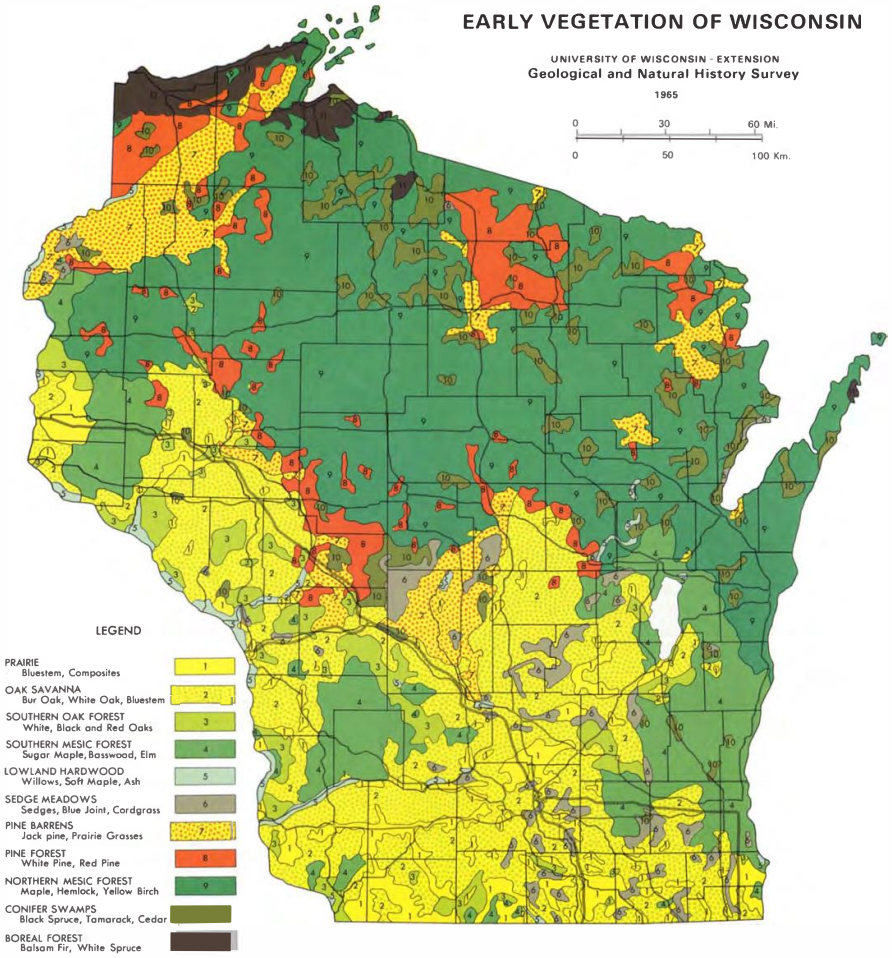
**Dry to dry-mesic prairie:** contain short to medium prairie grasses, often on bluffs or hills; well-represented today


**Wet to wet-mesic prairie:** contain tall prairie grasses mostly on loamy soils; often in wetland complexes

# Forests

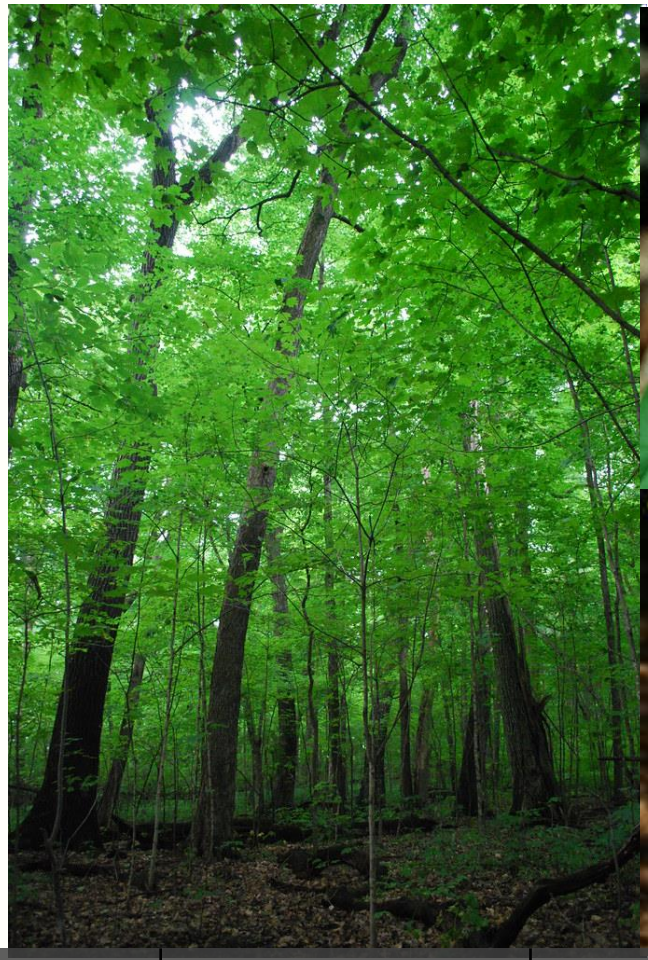
- Forests by woody plants – hardwoods or softwoods

1. Southern vs. Northern forests
2. Amount of moisture: dry (xeric), medium (mesic), and wet (also swamp, lowland, etc.)
3. Density of tree-cover (denser = forest; scattered = savanna)



**Southern mesic forests:** one of the most common forest types found in Southern Wisconsin

Dominated by sugar maple canopy; diverse layer of herbaceous plants such as trillium

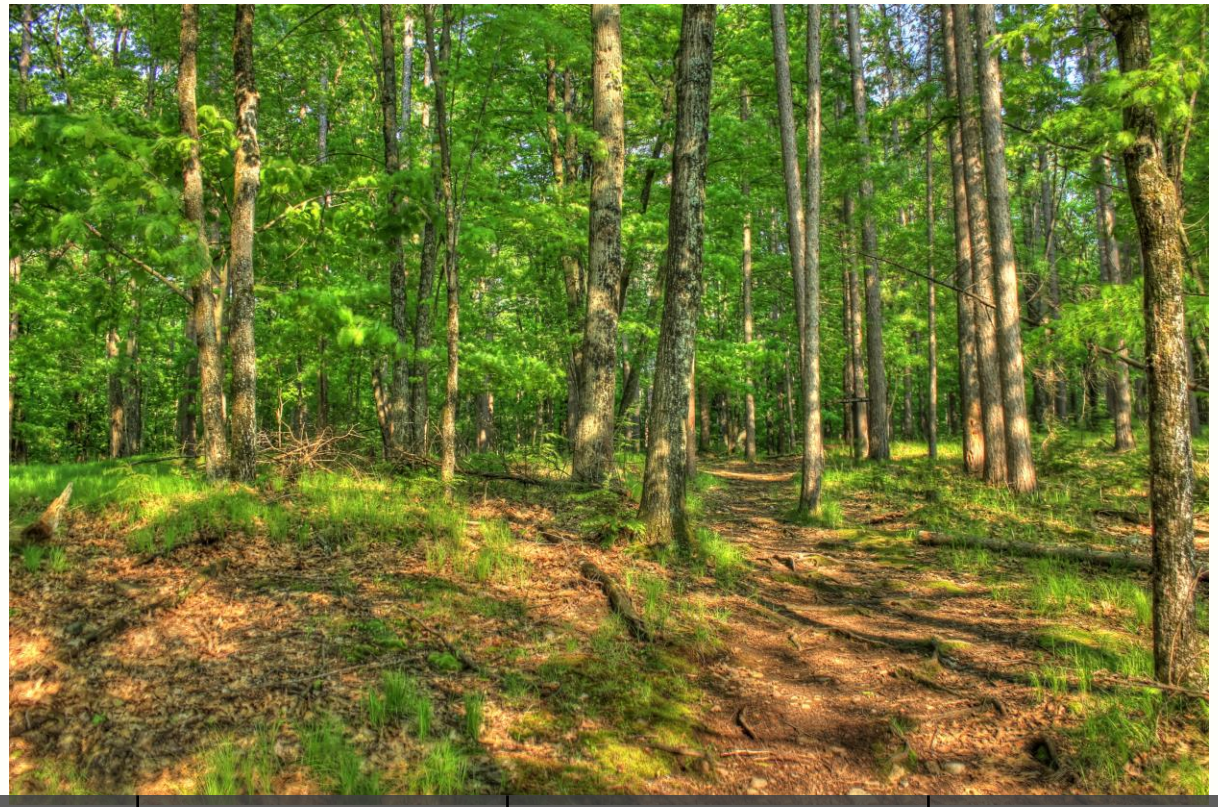


**Southern xeric forests:** oak and hickory dominated drier, more open forests

Well developed-layer of shrubs; interesting herbs

**Northern mesic forests:** one of the most common forest types in Wisconsin, dominated by sugar maple with some American beech, eastern hemlock, etc.

Depending on canopy, can be sparse understory or highly diverse!



**Northern xeric forests:** acidic nature of oak and conifer forests supports a range of unusual growth forms involving fungal associates

Important woody plants include red pine, pin oaks, and trembling aspen; blueberries and Northern herbs

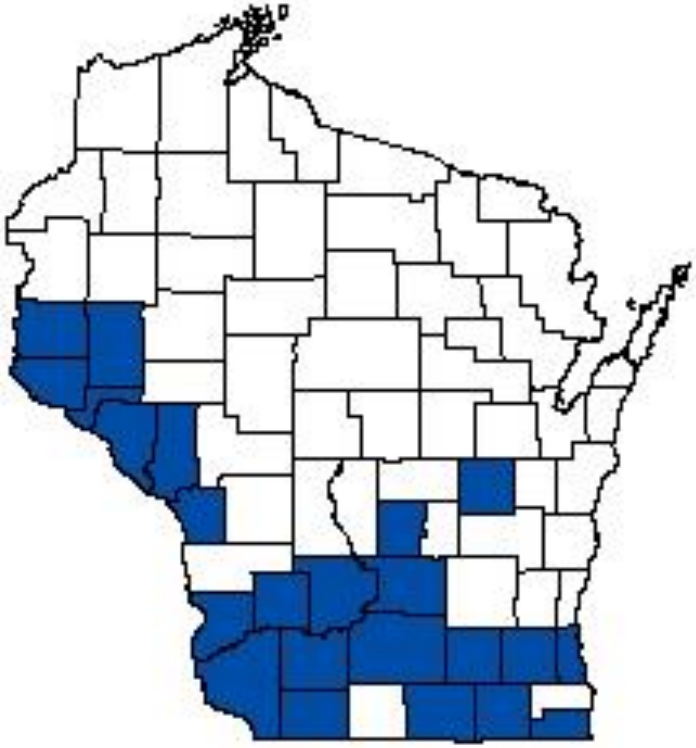
# Barrens and Savannas

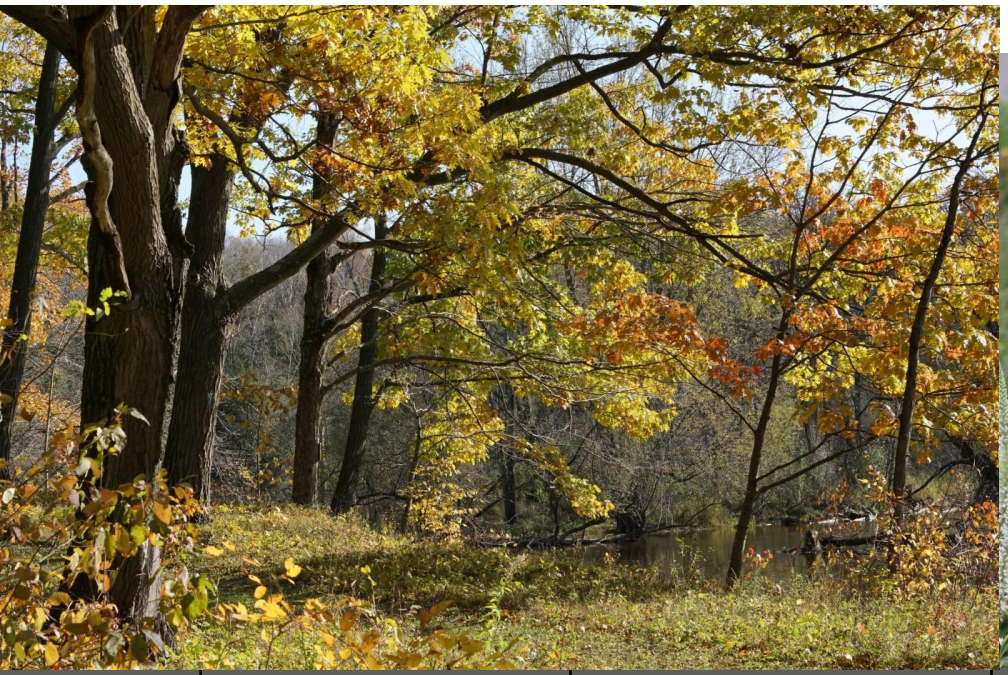
- Barrens and savannas have scattered woody plants but are interspersed with larger open areas
- Tend to occur on drier, less hospitable sites that limit tree growth (associated with glacial sandy plains)
- Both are rare globally

**Oak savannas / Oak openings:** Dominant vegetation type in S Wisconsin prior to European settlement

Oaks with thick bark to protect against fire; Diverse understory – shade tolerant and intolerant plants – *Heterogeneity promotes high diversity*

Now one of the most endangered habitats





**Oak and pine barrens:** very dry savannas that are dominated by mostly black oak and jack pine, respectively.

Interesting mix of Northern shrubs with some prairie grasses and herbs

Endangered species: Karner blue, Kirtland's warbler (Michigan)

# Wetlands

- The Wisconsin DNR recognized over 25 different types of non-forested wetlands and 10 different forested wetlands
- Some other communities we learned earlier can be classified as wetlands (e.g., wet prairies; hardwood swamps and wet forests)
- Non-forested wetlands can be classified in various ways but one important distinction is in the source of water: from groundwater or primarily from rain


Open bogs: acidic with low-nutrients and typically fed by rainwater (ombrotrophic). Hummocks of peat moss

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**Fens:** often alkaline wetlands associated with graminoids and fed by groundwater (minerotrophic)

**Fens:** often alkaline wetlands associated with graminoids and fed by groundwater (minerotrophic)


# Bare Soil and Bedrock Communities

**Apostle Islands, Wisconsin**

# Cliffs and talus slopes

# Indiana Dunes National Park, Indiana

# Sleeping Bear Dunes, Michigan


Anthropogenic Habitats!

### 35. *DIPLACHNE*, SPRANGLE-TOP

Greek, *diploos*, "double," and *achne*, "awn"

Sprawling annuals or perennials; panicles with spikelets appressed to lower side of the main branches, many-flowered, the lemmas short-awned from between two small teeth. Several dozen species; pantropical and warm temperate regions.

**_Diplachne fusca_ (L.) P. Beauv. ex Roem. and Schult. subsp. _fascicularis_ (Lam.) P. M. Peterson and N. Snow, bearded sprangle-top**

*fusca*, "dark or brown"

Illustration

An uncommon southern US and South American weed of disturbed ground that has been heavily salted: highway margins, railroad yards, and pickle factory grounds. First collected in 1937 and becoming more frequent farther north; in 2012, for example, it was present at sites in Stevens Point, Appleton, and Marinette. Fassett (1951) treats this as *Diplachne fascicularis*, Voss and Reznicek (2012) as *Leptochloa fusca* (L.) Kunth.

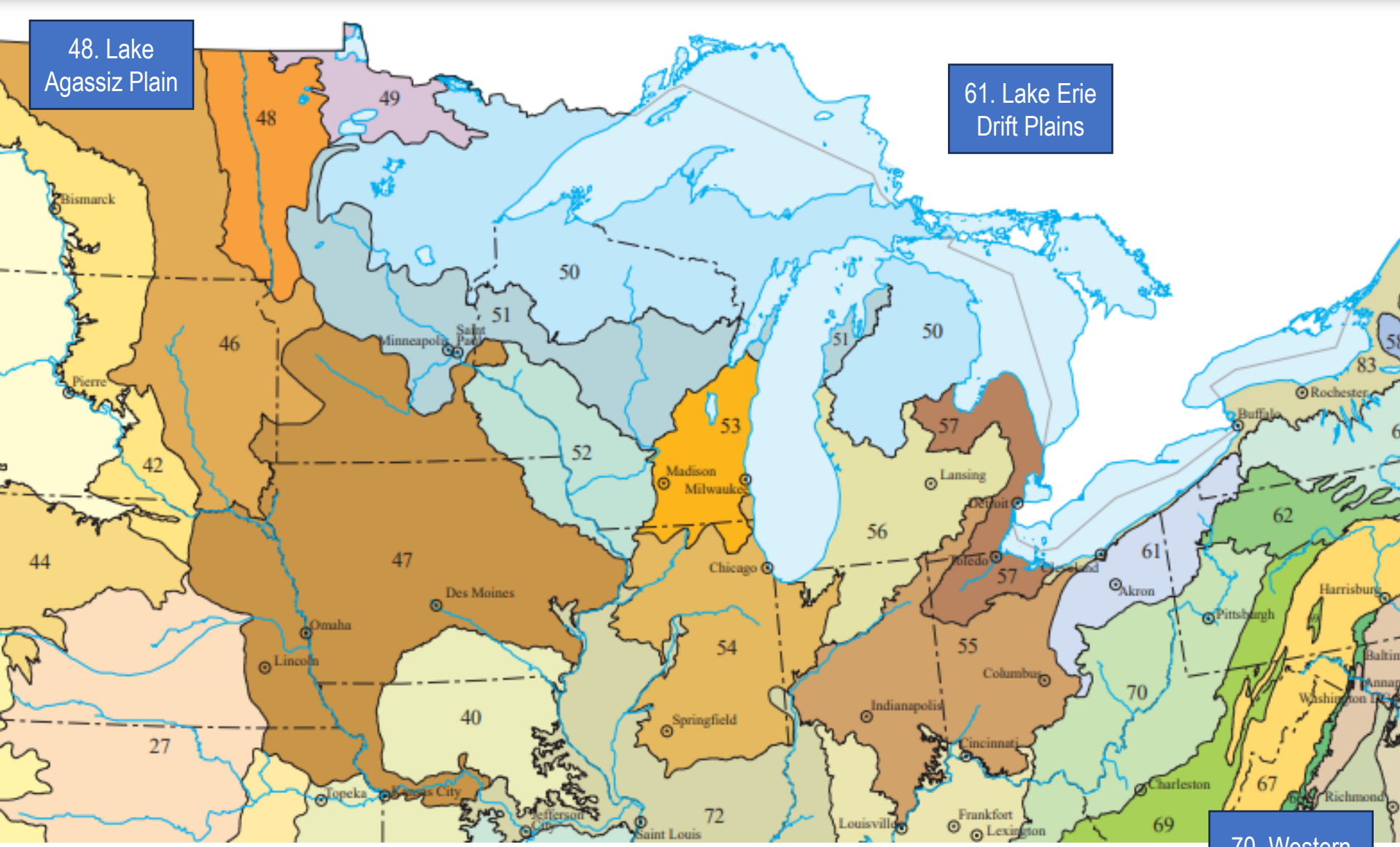

Portion of inflorescence


Spikelet

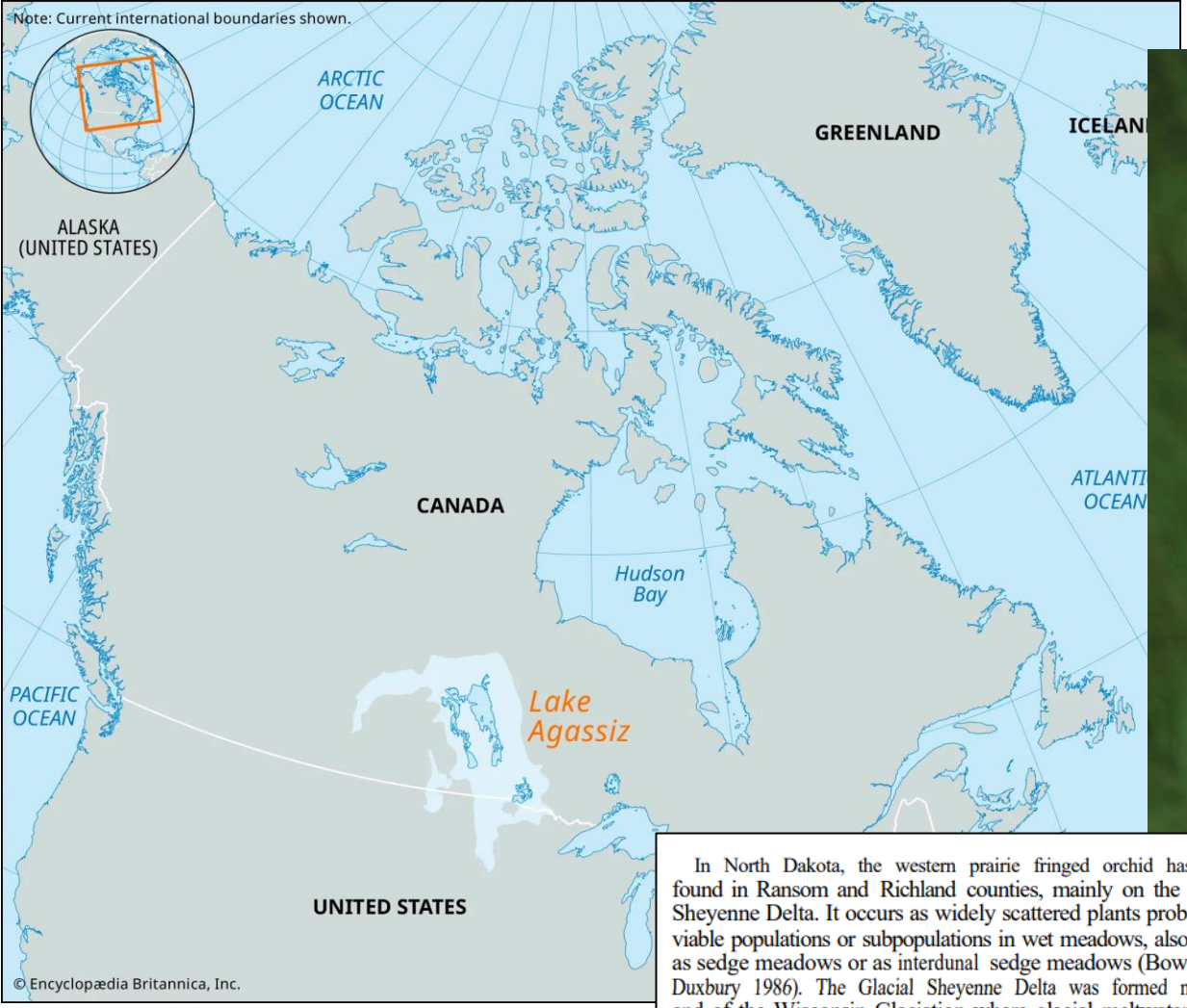

Share 0 Pos

**University of Wisconsin-Madison, Wisconsin State Herbarium (WIS)**

**Catalog #:** v0404638WIS
**Occurrence ID:** a8041000-084e-4261-b103-4eefeffdc058
**Taxon:** *Symphyotrichum ciliatum* (Ledeb.) G.L.Nesom
**Family:** Asteraceae
**Collector:** John G. Zaborsky
**Number:** 1484
**Date:** 2017-10-11
**Verbatim Date:** 10/11/2017
**Locality:** United States, Wisconsin, Jefferson, Lake Mills, Rest Area 14 along westbound I-94
43.086927 -88.824768
**Verbatim Coordinates:** 43.086927, -88.824768
**Habitat:** Mucky area at parking lot edge leading to on-ramp to a highway. Plants robust and common; with Hordeum jubatum and Juncus bufonius.
**Notes:** Dups at MIL, OSH, UWSP




# Level III Ecoregions (EPA)




In North Dakota, the western prairie fringed orchid has been found in Ransom and Richland counties, mainly on the Glacial Sheyenne Delta. It occurs as widely scattered plants probably as viable populations or subpopulations in wet meadows, also known as sedge meadows or as interdunal sedge meadows (Bowles and Duxbury 1986). The Glacial Sheyenne Delta was formed near the end of the Wisconsin Glaciation where glacial meltwater of the glacial Sheyenne River emptied into Glacial Lake Agassiz and deposited sands, clays, and gravels. A layer of nearly impervious lake sediments is below the delta formation. This layer is responsible for the relatively high water table of the area (Manske and Barker 1988).

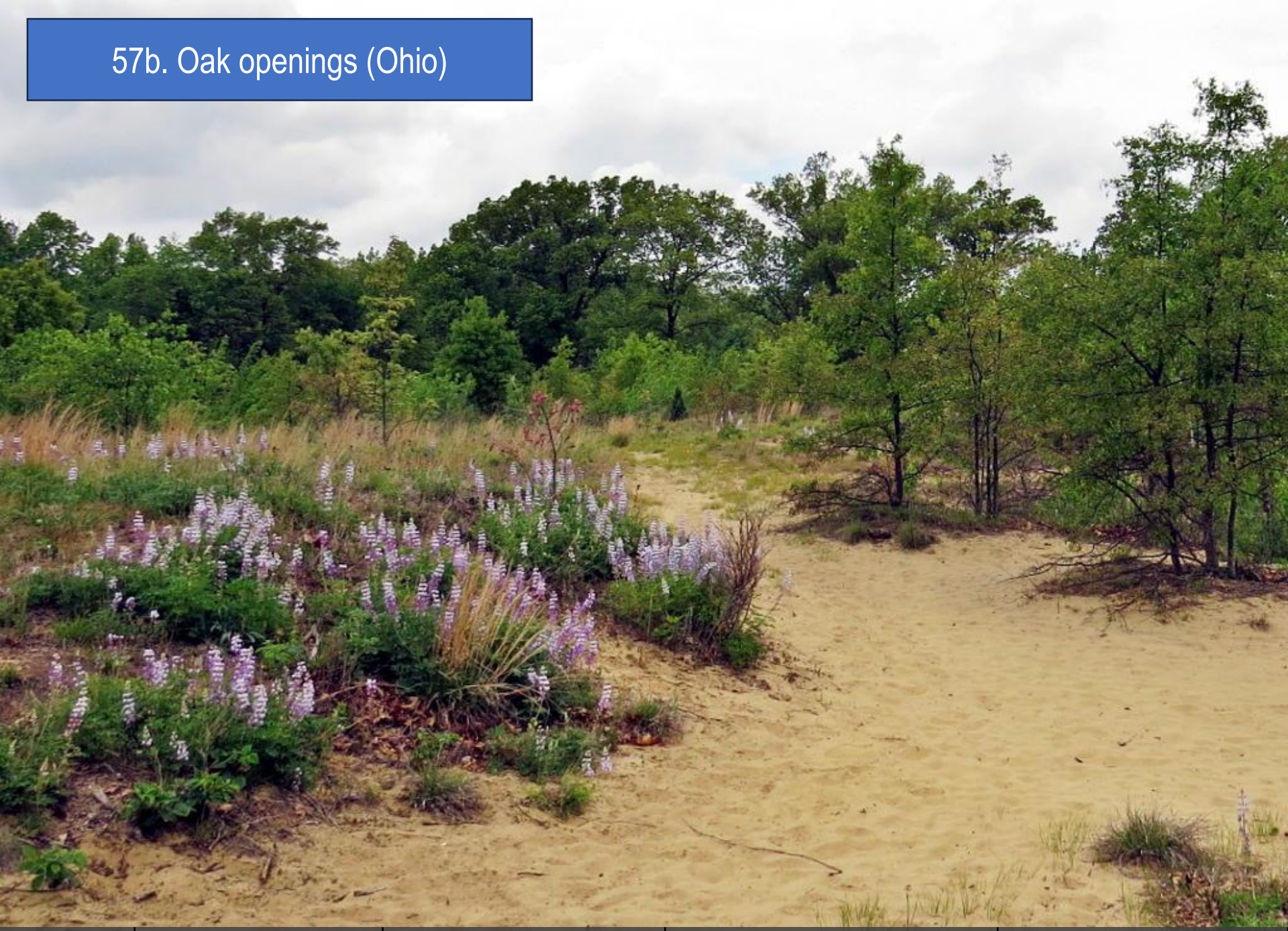
Vegetation on the Glacial Sheyenne Delta consists of native forest, woodland and grassland communities and nonnative (cropland) replacement communities with associated cultivated and introduced plant species. The Delta has been divided into 11 habitat

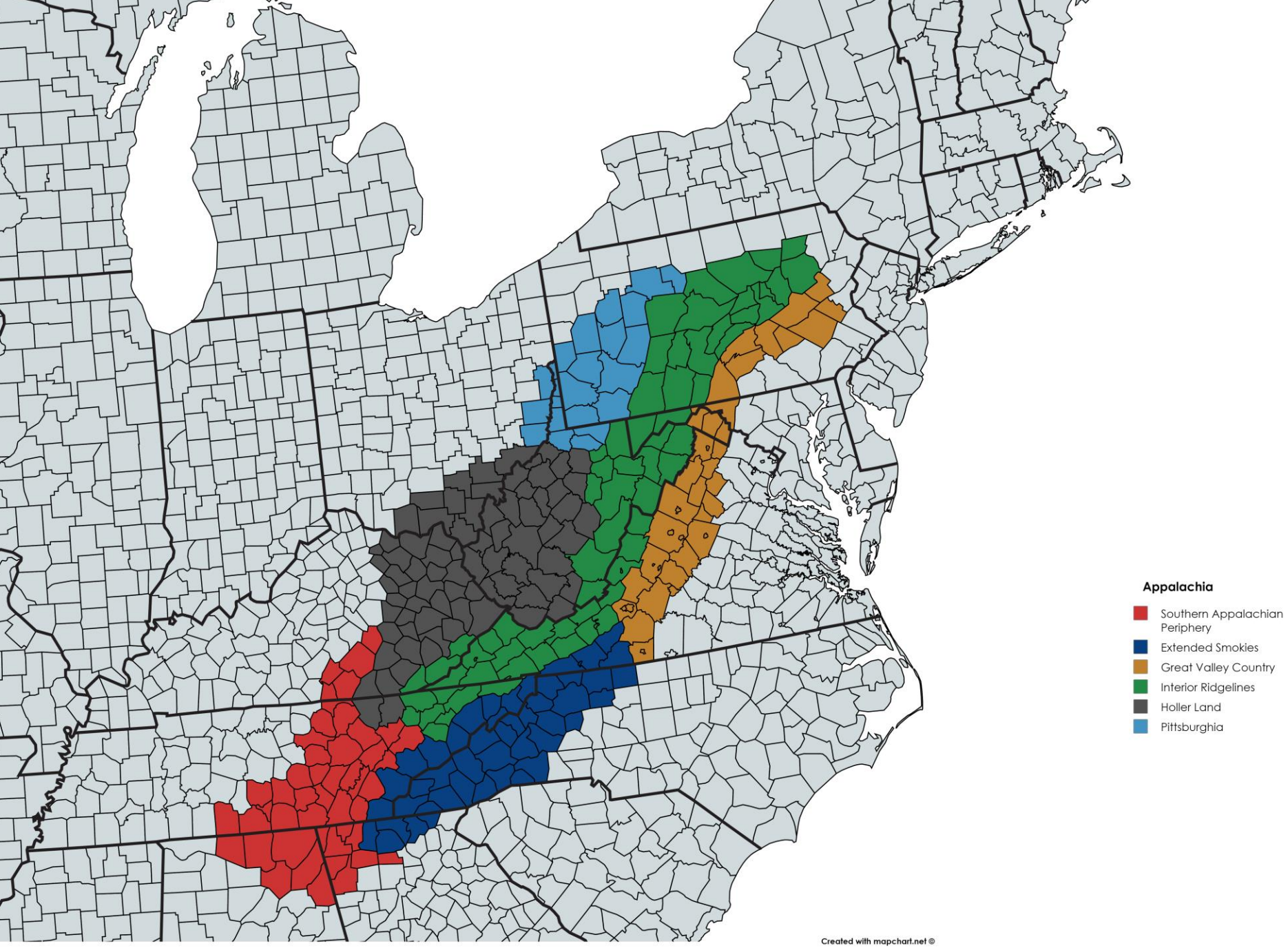
48. Lake Agassiz Plain

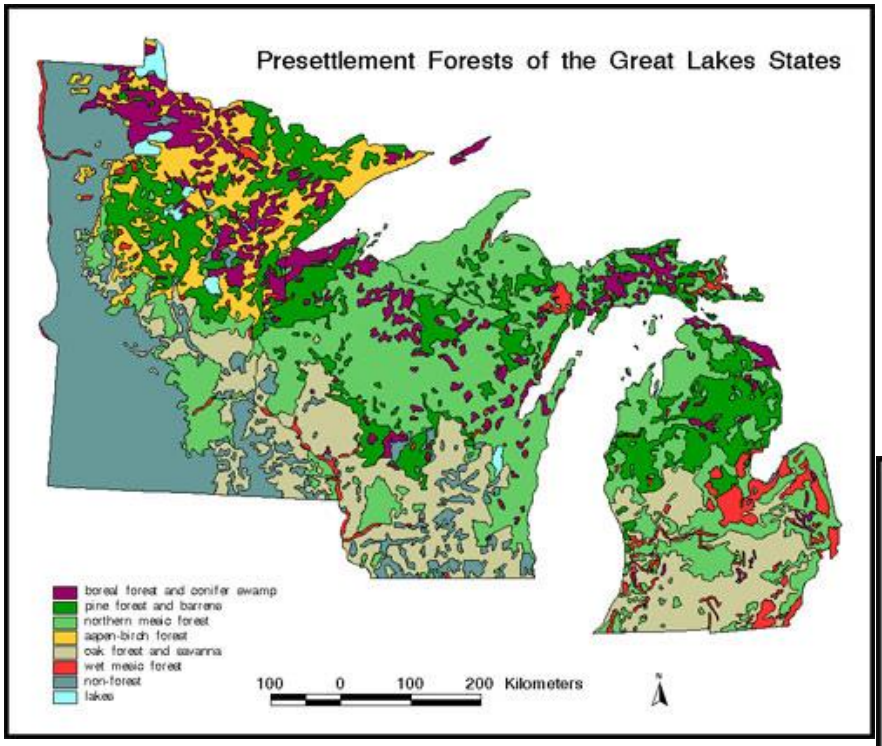
# 46o. Big Stone moraine, Minnesota

# 50d. Lake Superior Mineral ranges

# 57b. Oak openings (Ohio)




Appalachia
Southern Appalachian Periphery
Extended Smokies
Great Valley Country
Interior Ridgelines
Holler Land
Pittsburghia
Created with mapchart.net ©




Pre-European forests

vs.

the forests today