

Inland Lake Climate Change Science and Information

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Michigan Chapter

North American Lake Management Society

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Michigan State University



ASSESSING THE IMPACT OF CLIMATE CHANGE ...

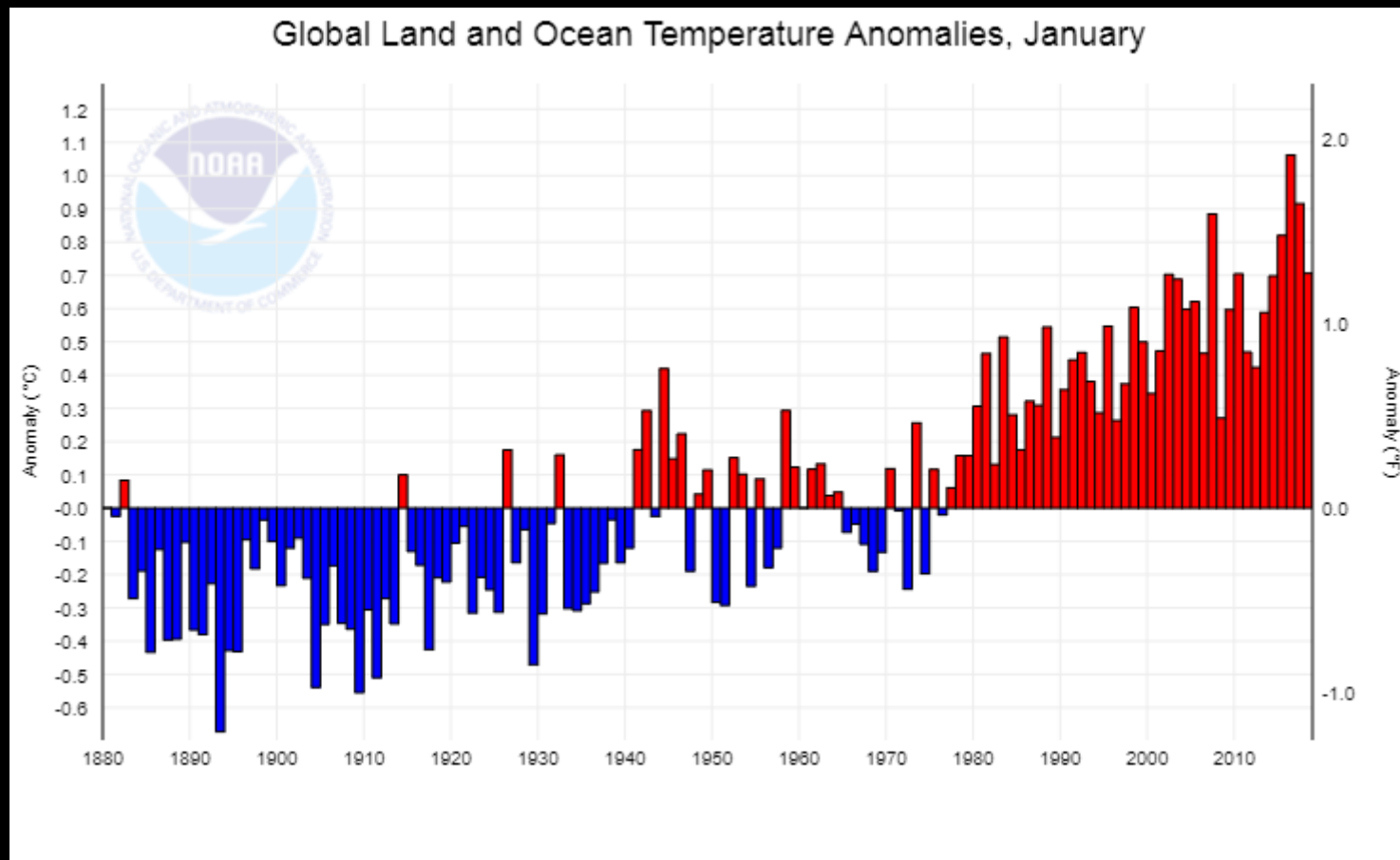


THE SCIENTISTS



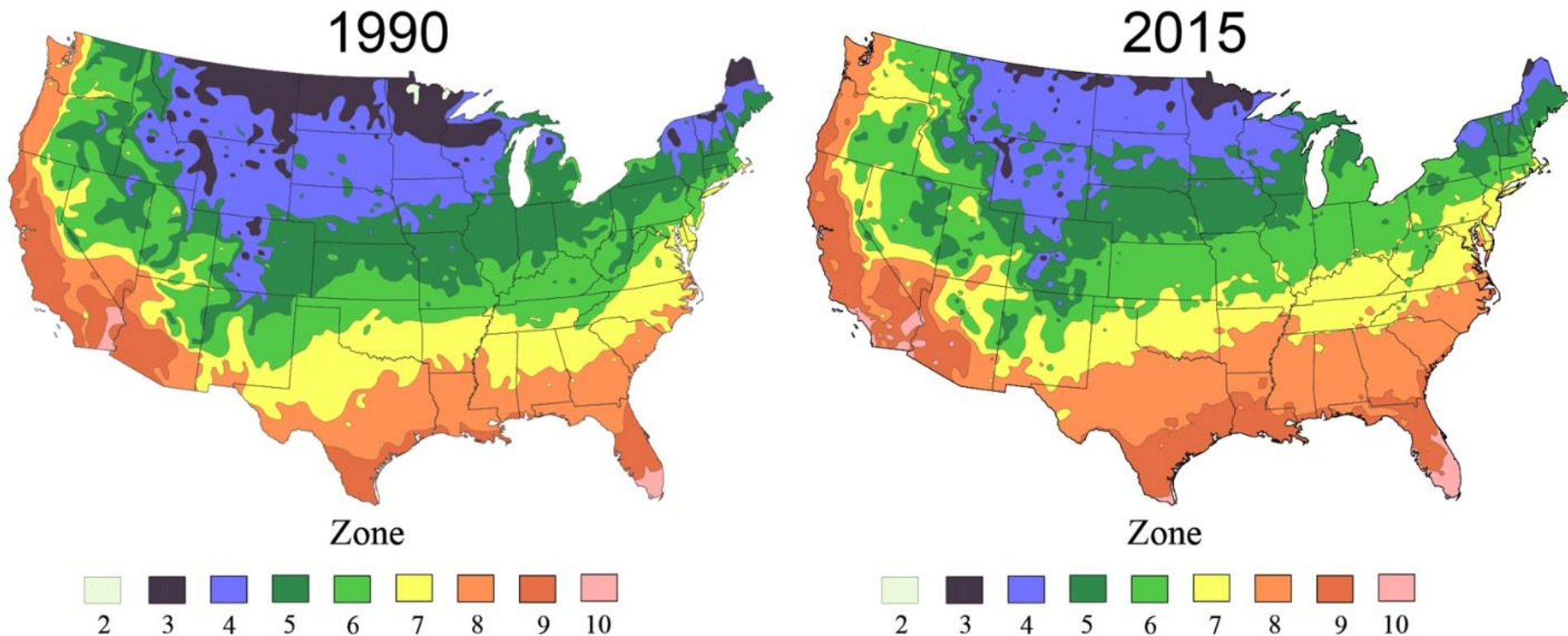
THE POLITICIANS

Recent Climate Change



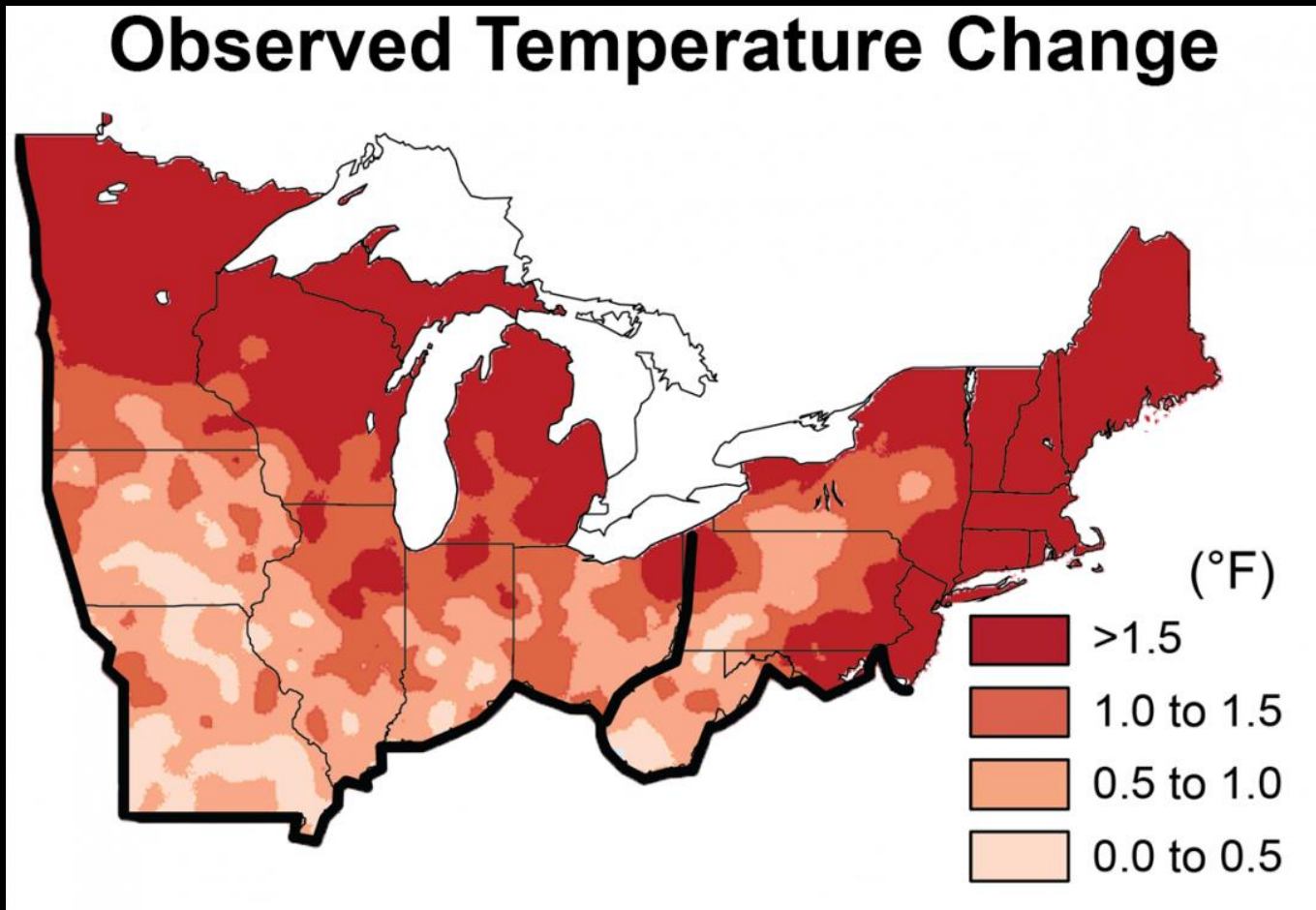
<https://www.ncdc.noaa.gov/cag/global/time-series>

Recent Climate Change

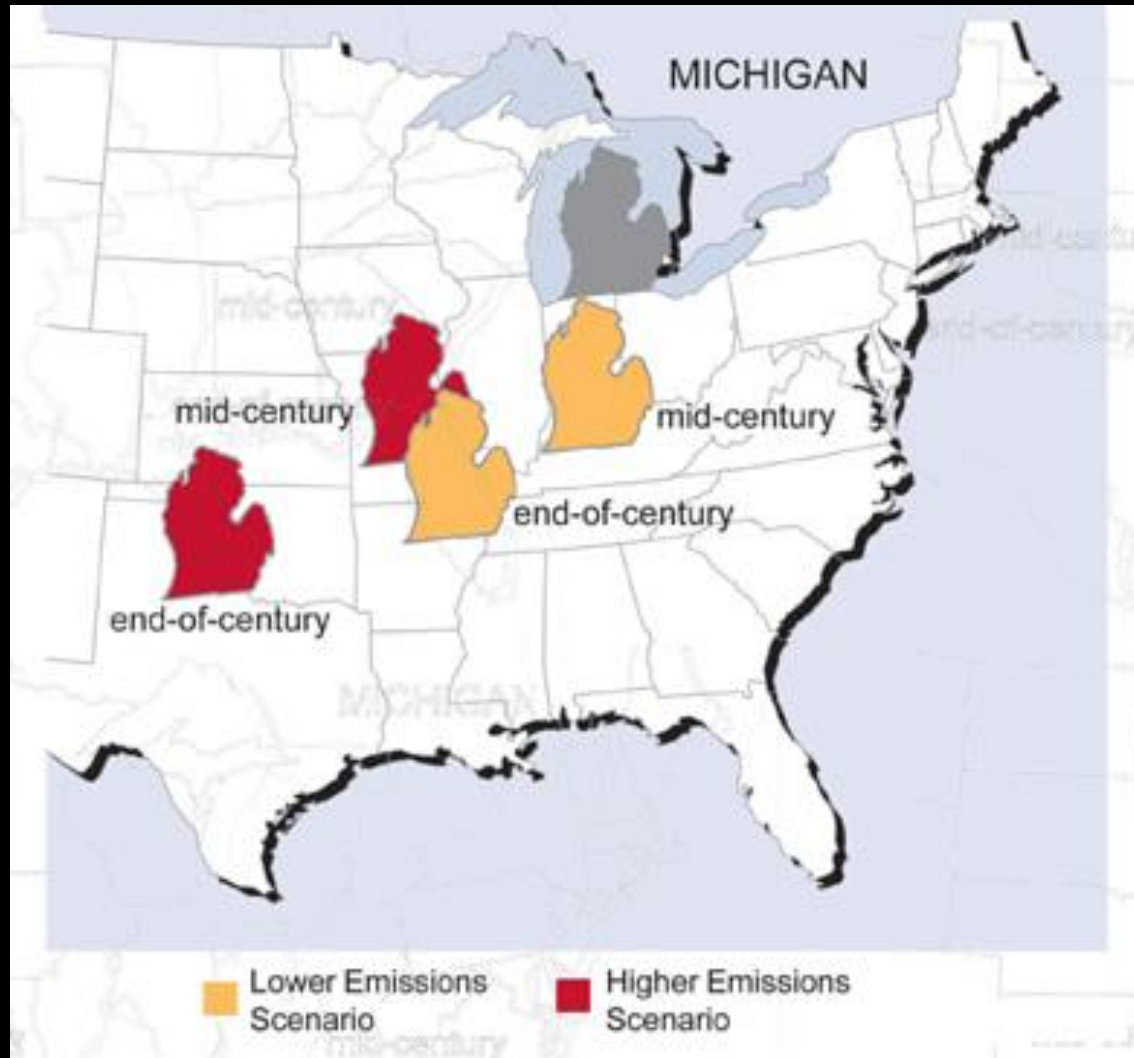


Plant Hardiness Zones, 1990 and 2015. Images from USDA and Arbor Day Foundation

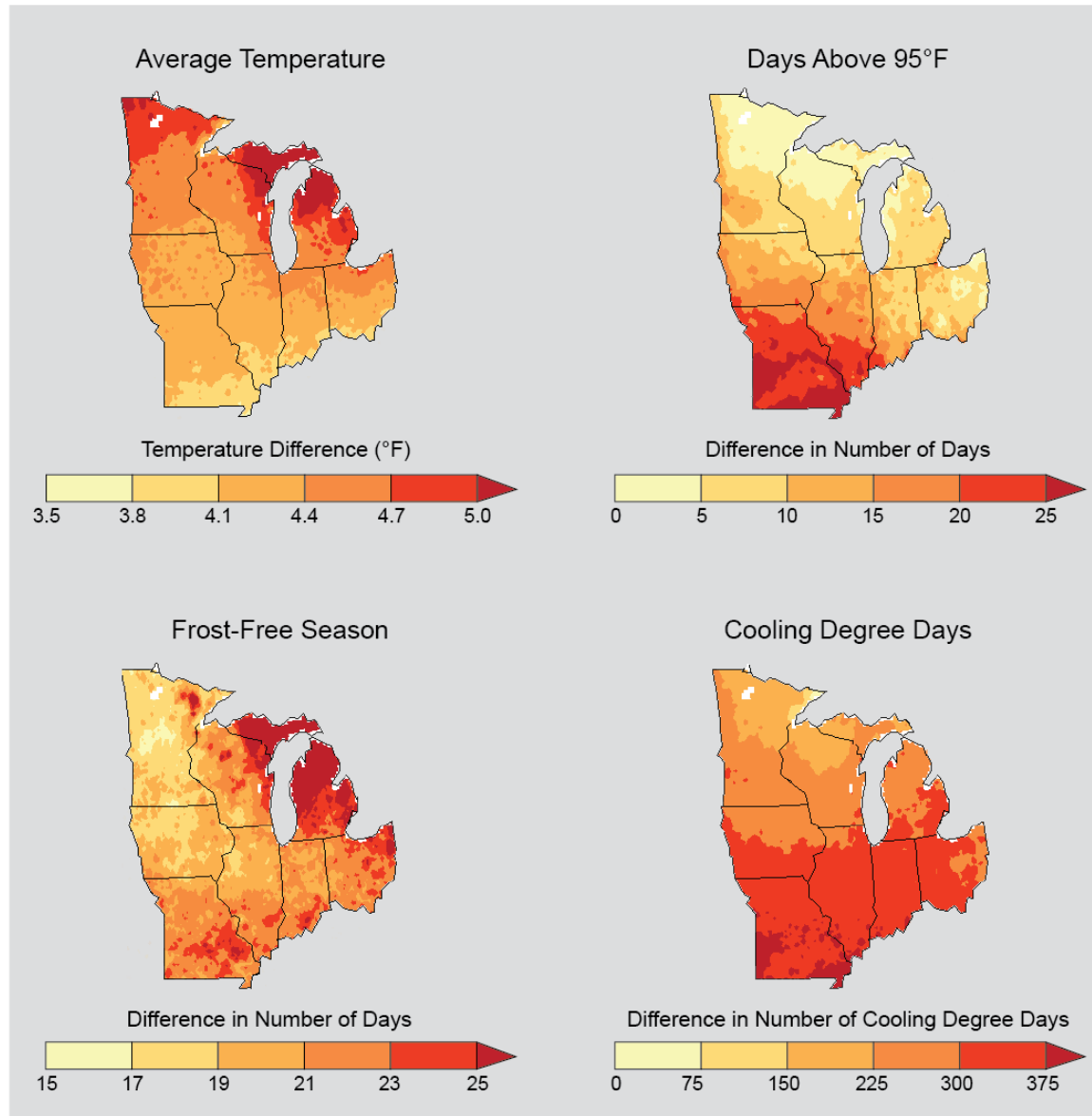
Recent Climate Change



Future Climate Change

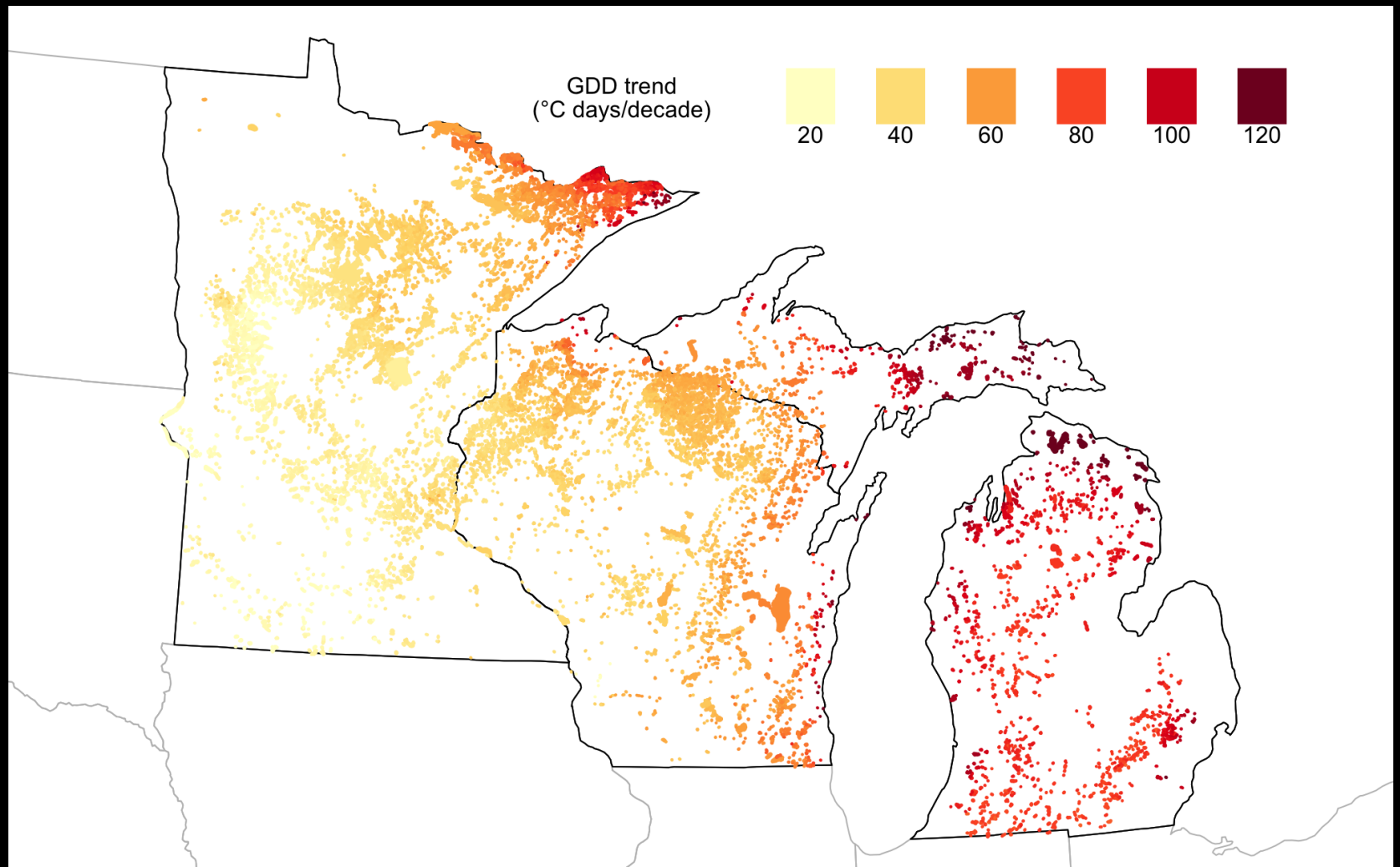


Projected Mid-Century Temperature Changes in the Midwest



Projected mid-century changes in temperature for the Midwestern U.S. Figure source: Third National Climate Assessment: Chapter 18: Midwest.

Lake Temperature Change 1979-2015

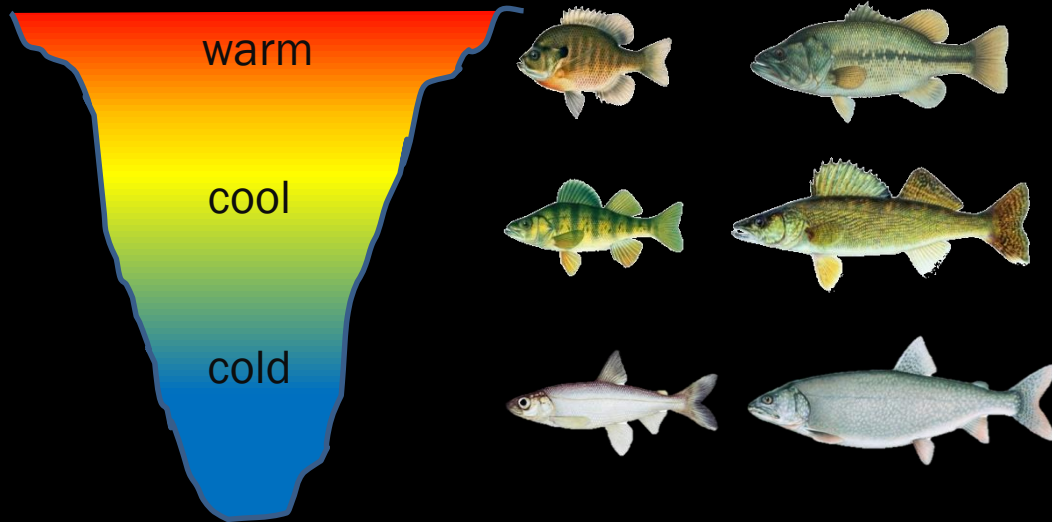


Winslow et al 2017

Climate Change Effects on Lakes

- Increased period of stratification
- Reduced dissolved oxygen
- Reduced ice cover
- Biota

Potential Effects on Fishes



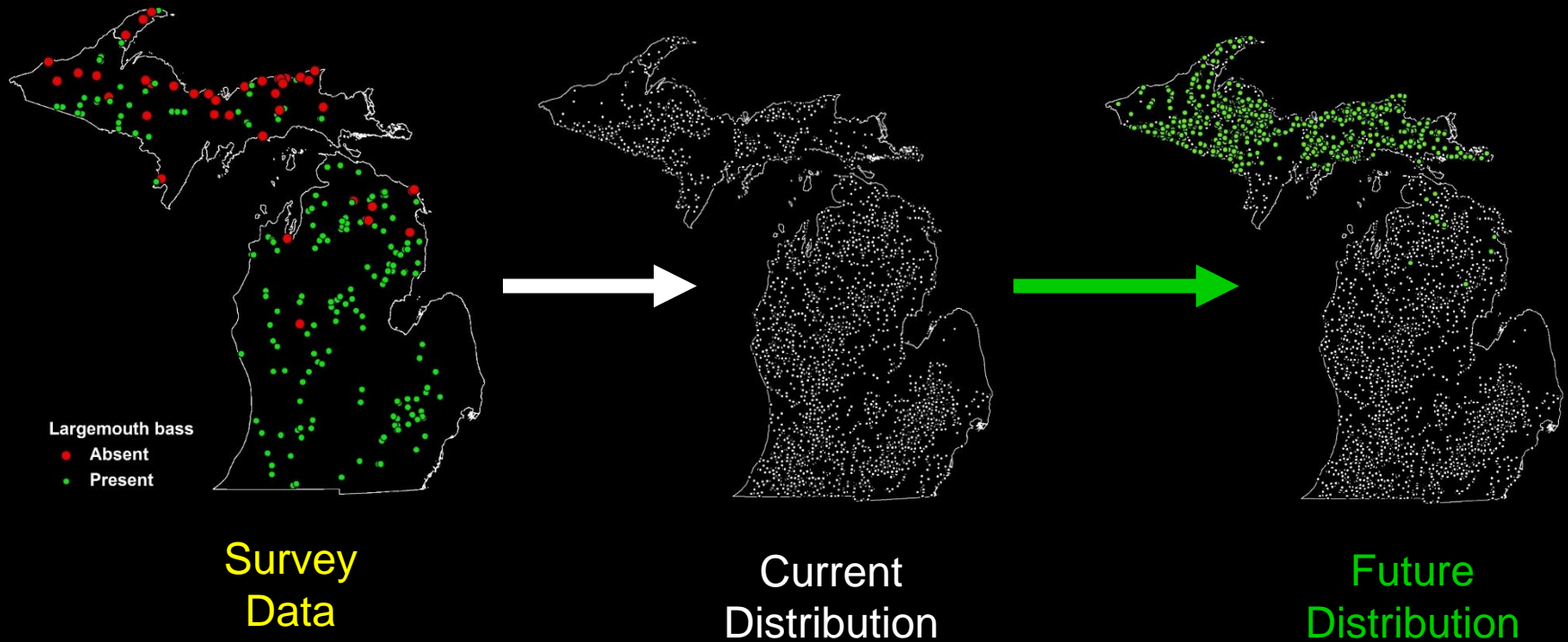
- Habitat suitability
- Growth
- Spawning

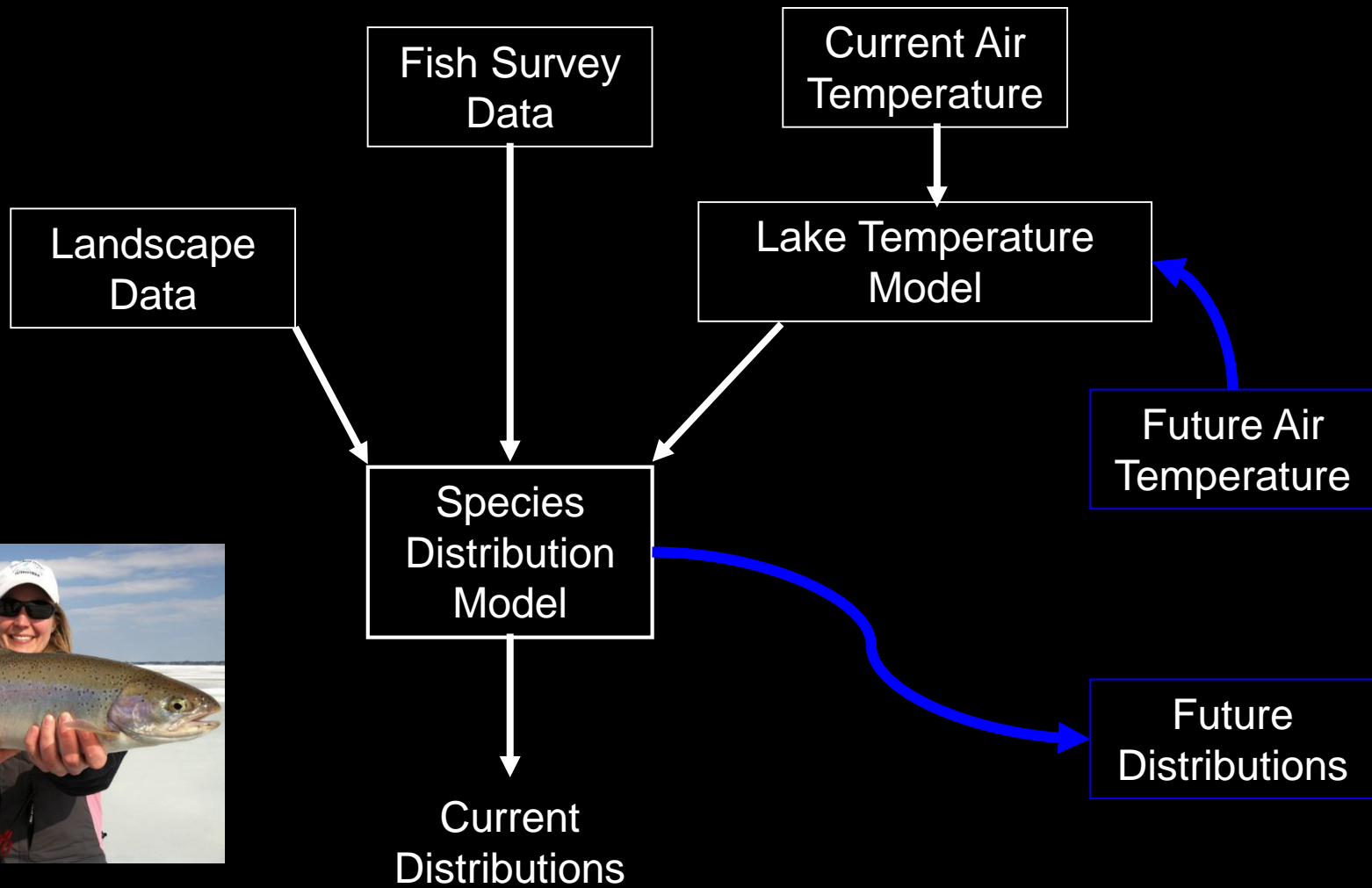
Assessing Climate Change Effects on Lake Fishes in Michigan

Needs

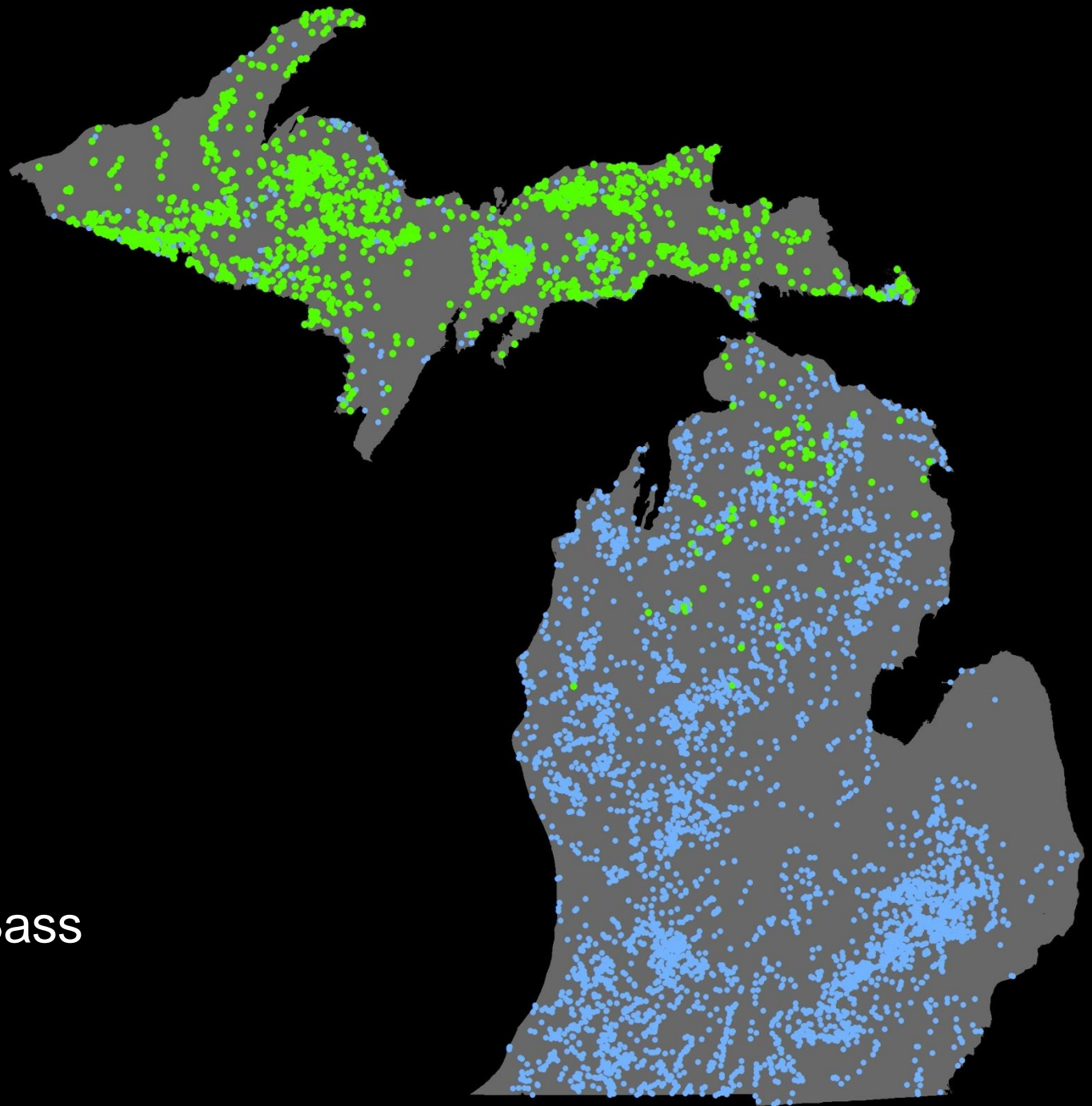
- How will lake temperatures and fish species respond?
- What lakes and fish species are sensitive/resilient to change?

Species Distribution Modeling

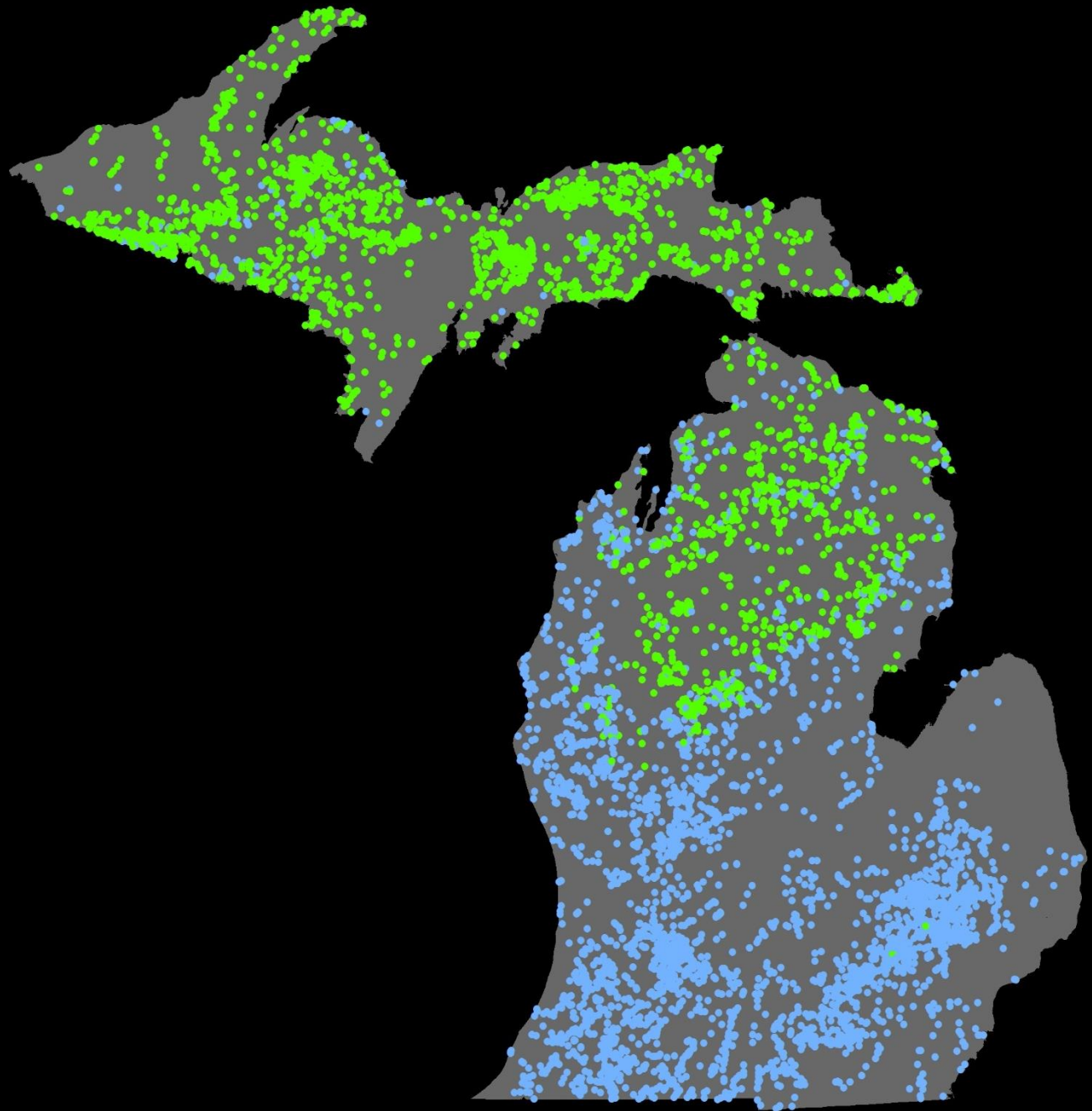




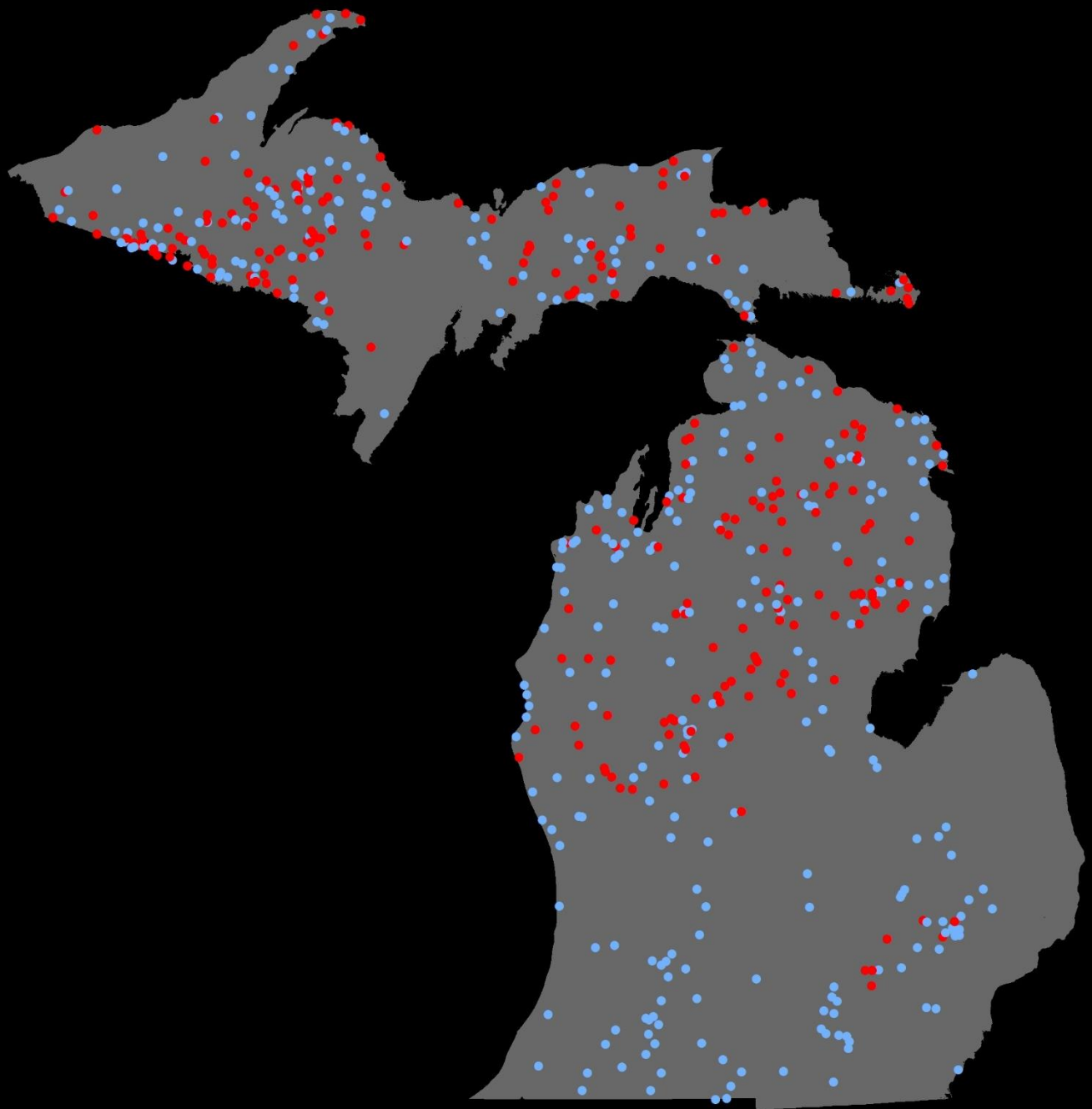
Largemouth Bass



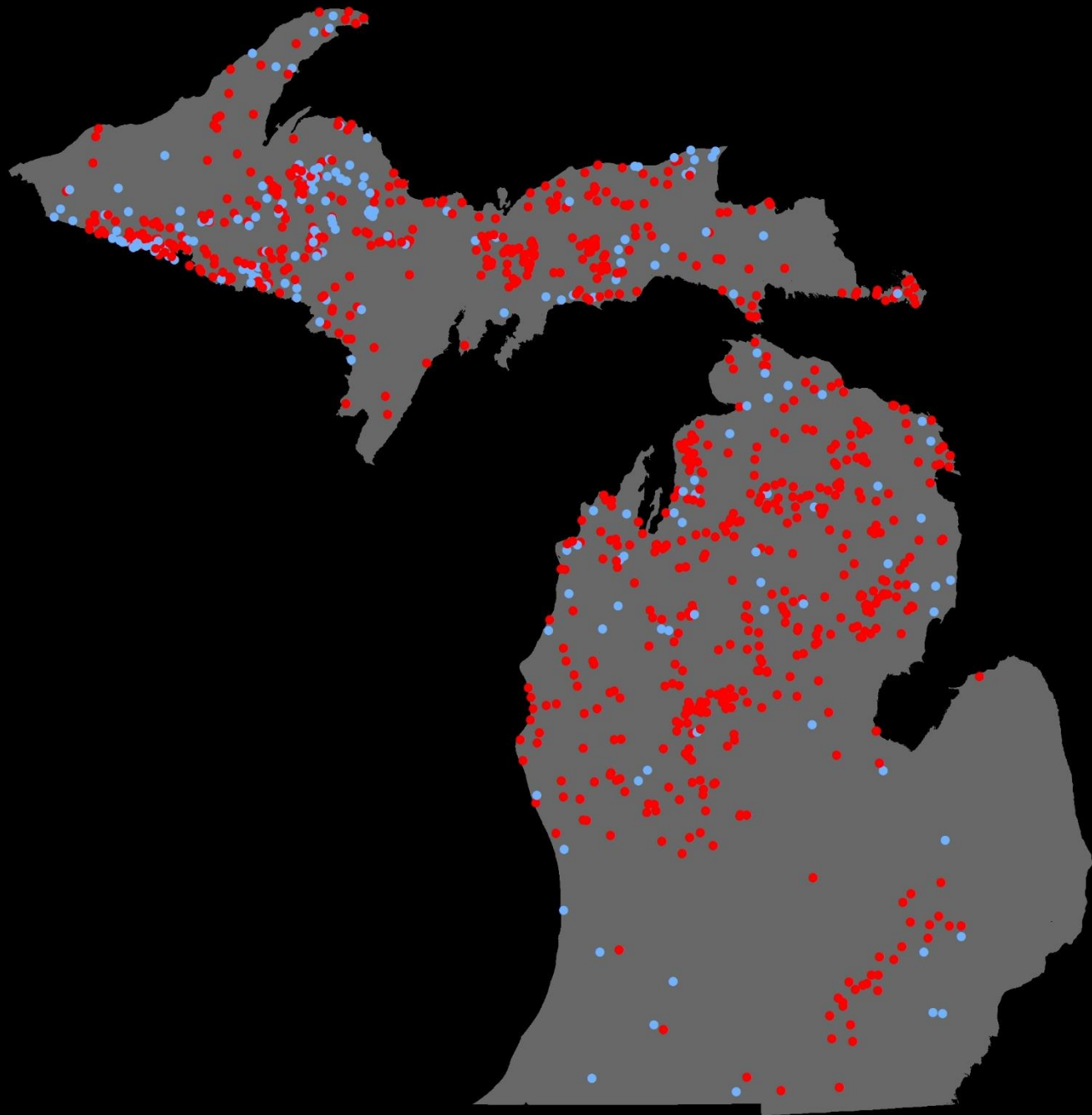
Black Crappie



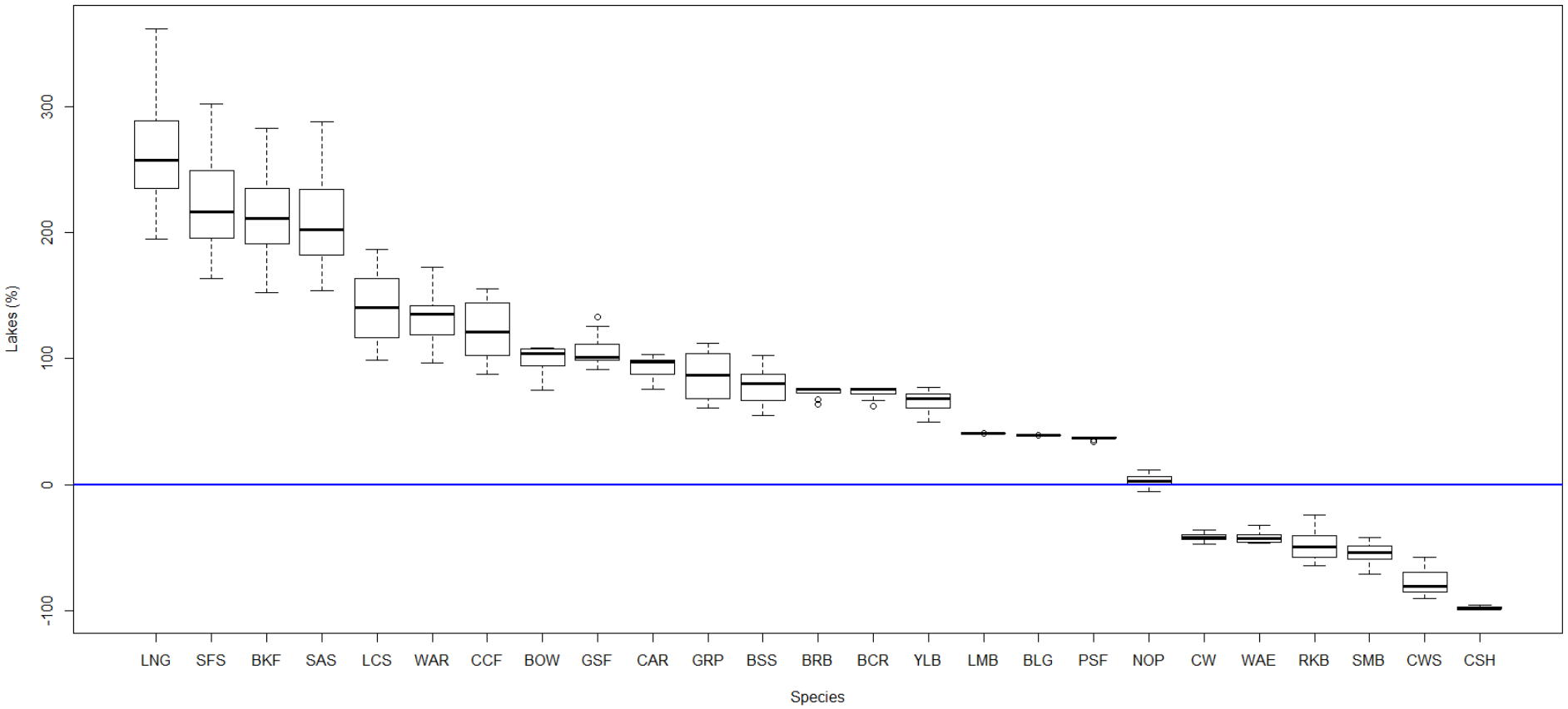
Walleye



White Sucker



Mid-Century Suitability Change



Species Changes

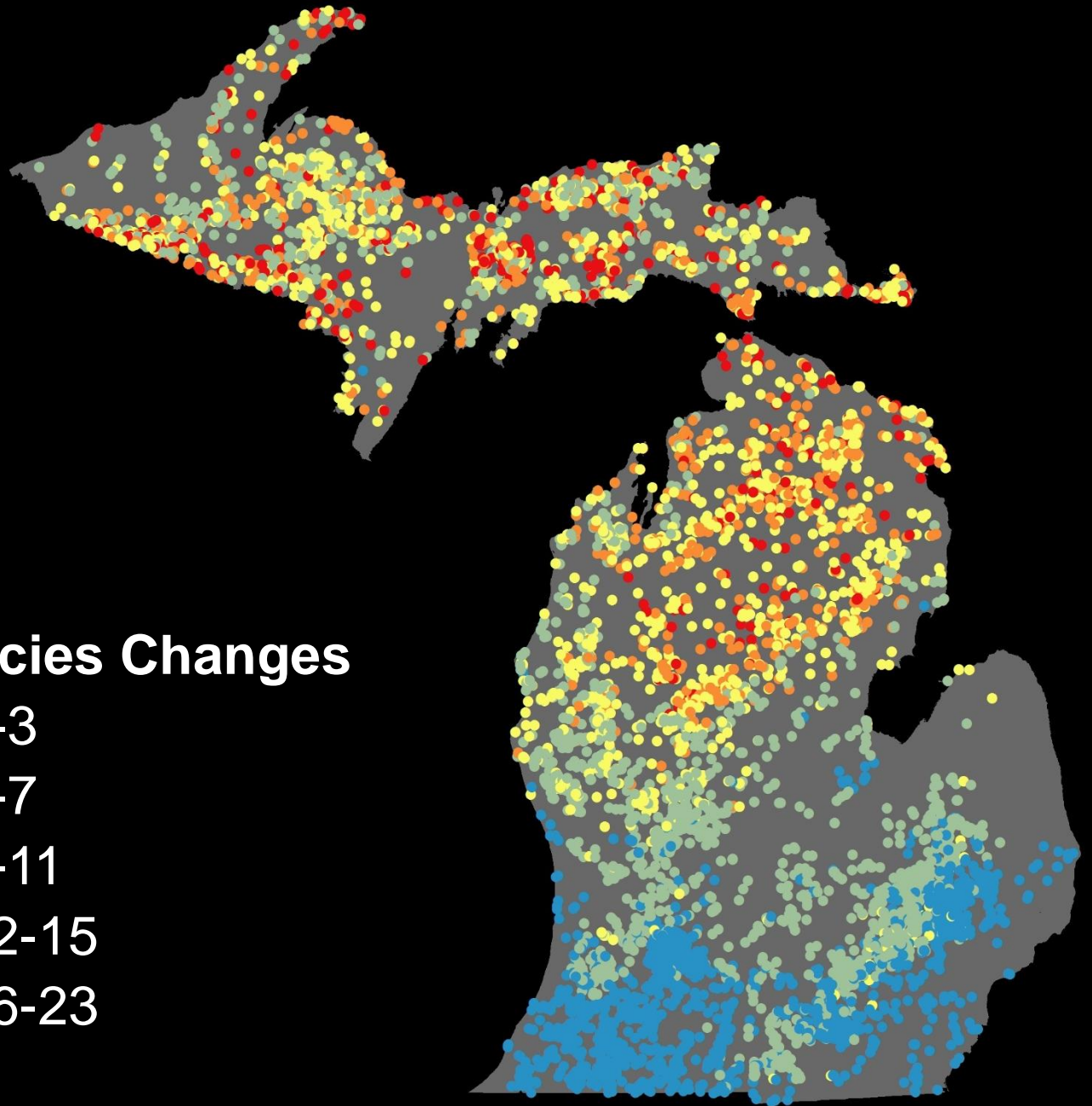
! 0-3

! 4-7

! 8-11

! 12-15

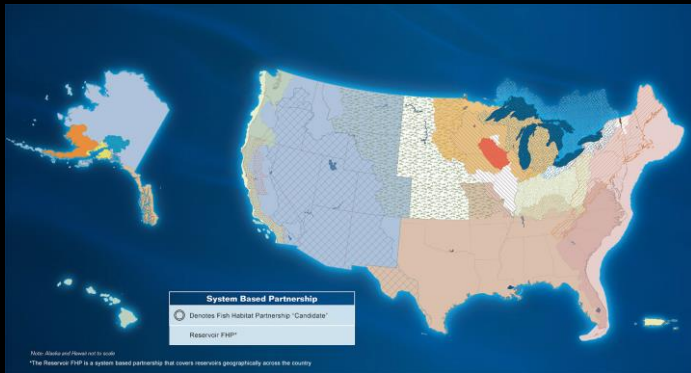
! 16-23



A Framework for Assessing Conditions and
Prioritizing Actions in the
Midwest Glacial Lakes Fish Habitat Partnership

Midwest Glacial Lakes Partnership

- ~40,000 lakes

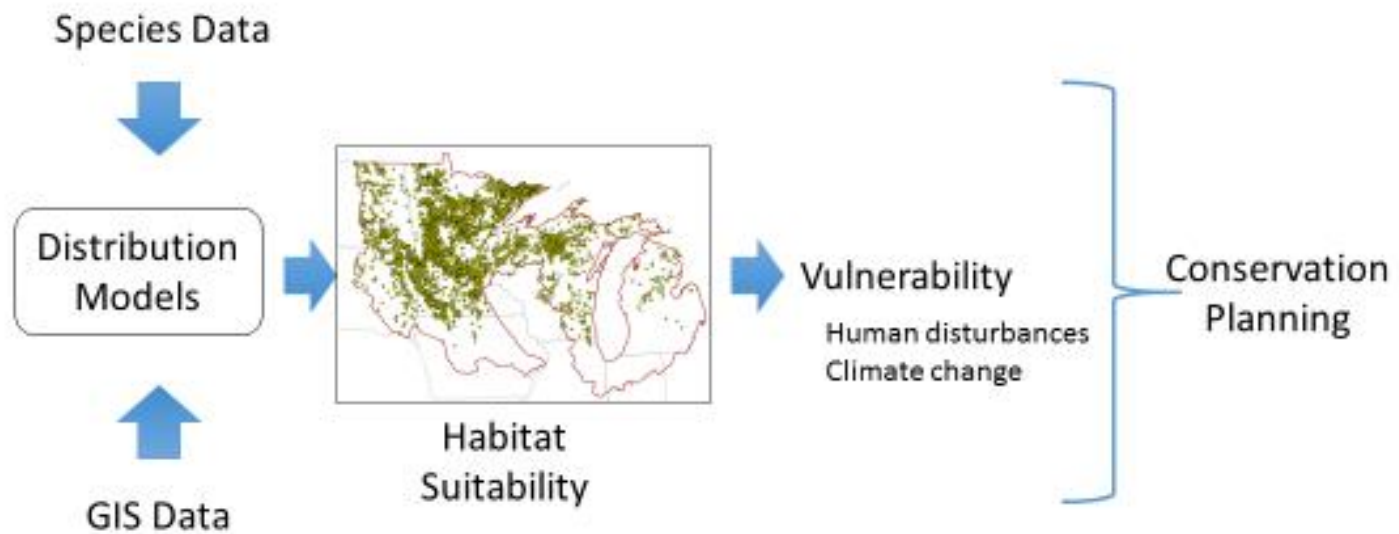


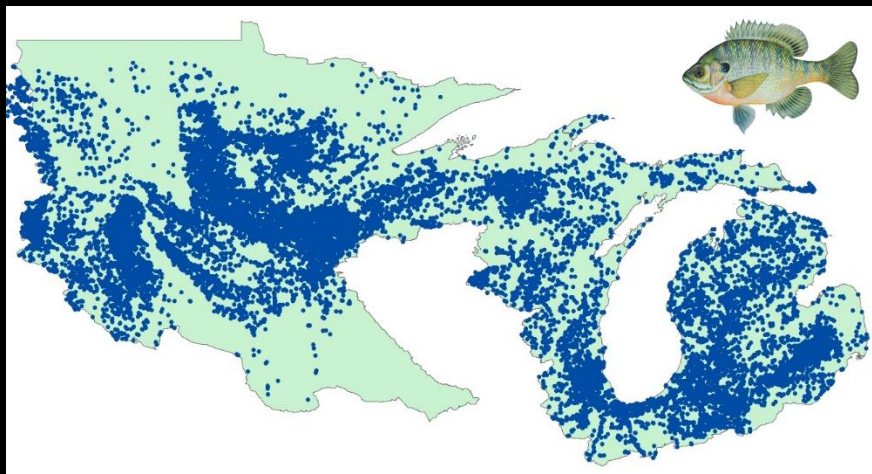
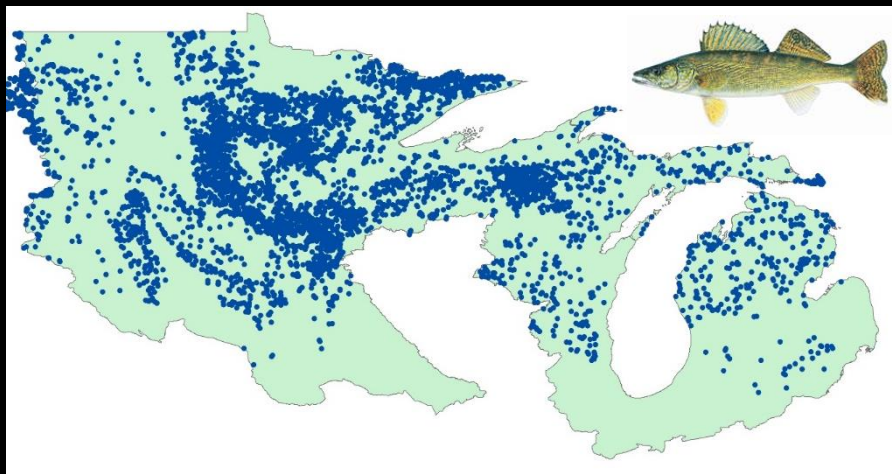
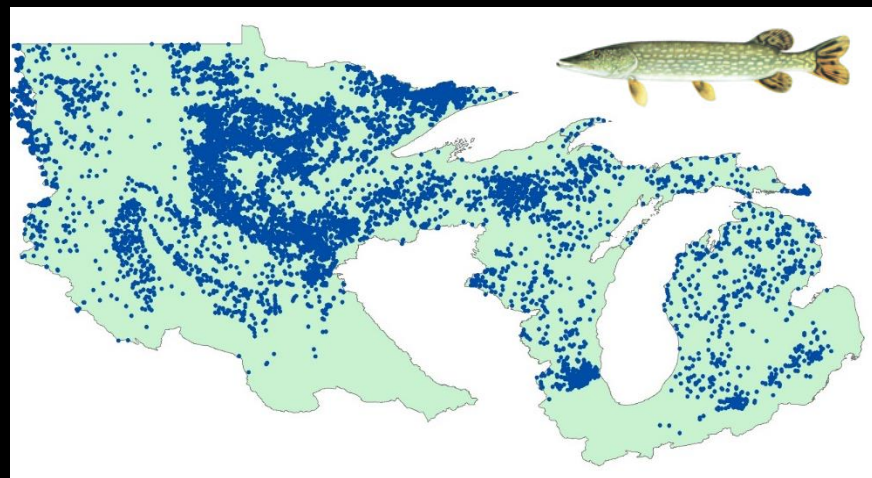
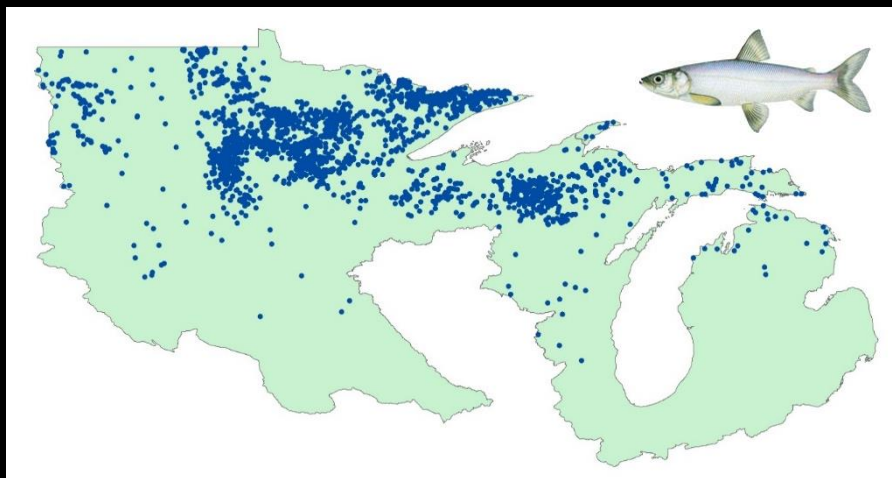
Needs

- Types and location of waters
- Condition and resiliency
- Prioritizing actions and funding

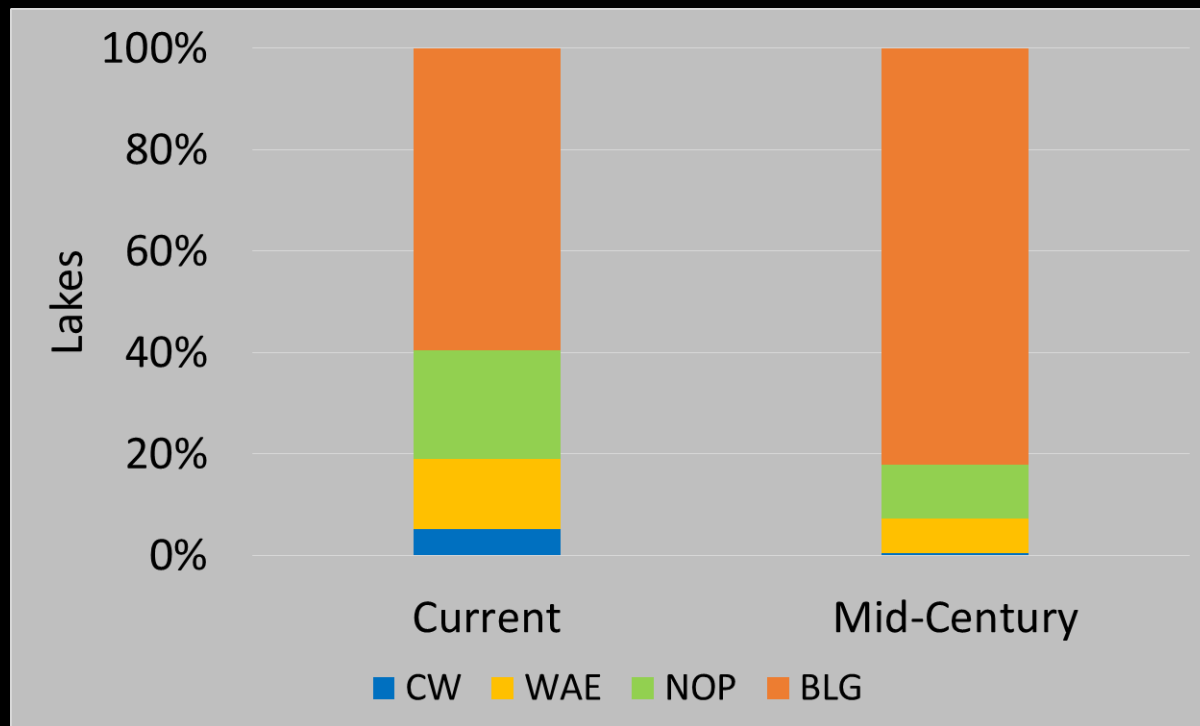


Framework



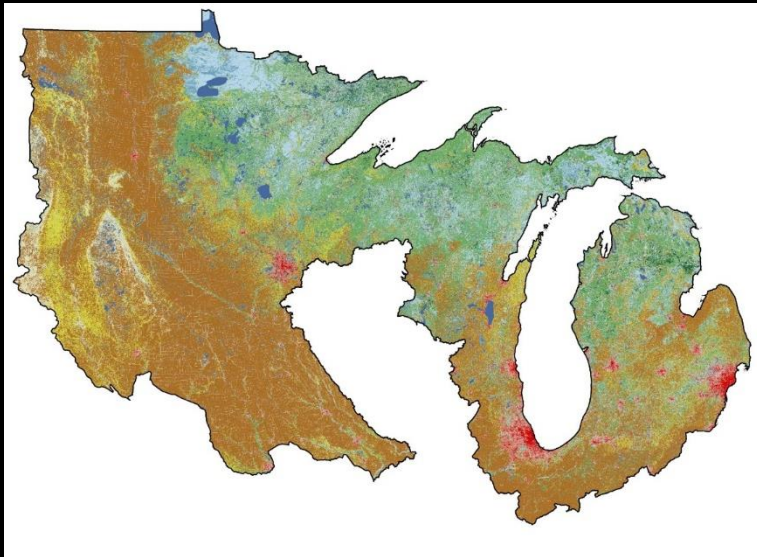


Assessing Climate Change



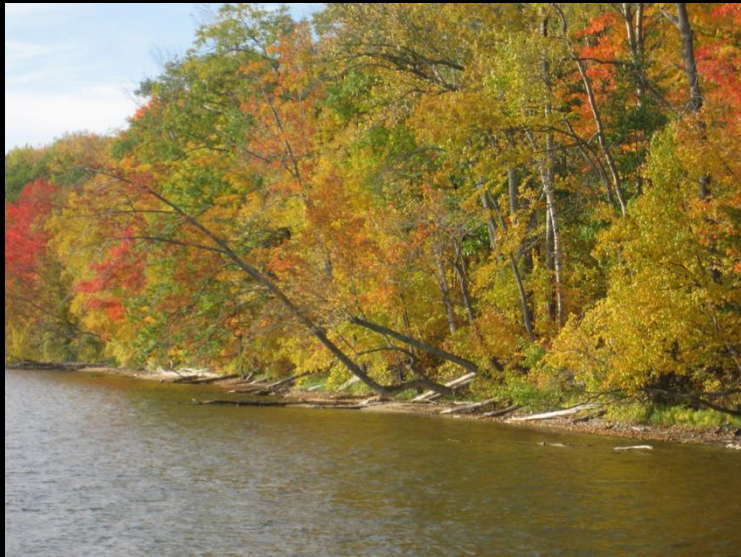
Assessing Human Disturbance

- Ag+Urban in lake catchment



Assessing Protection

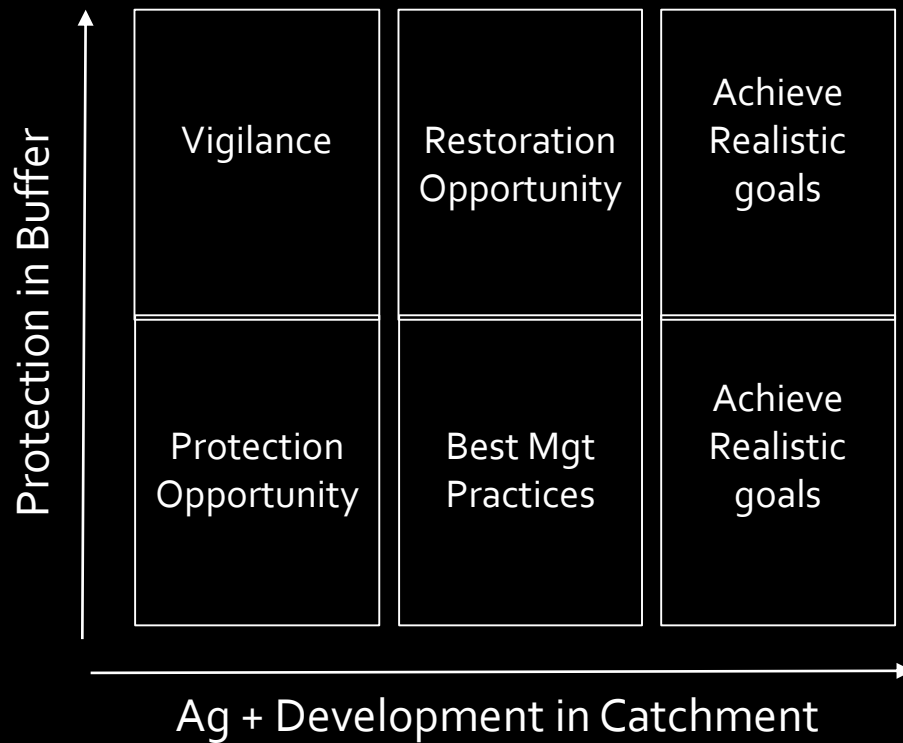
- Protected lands in 100m buffer



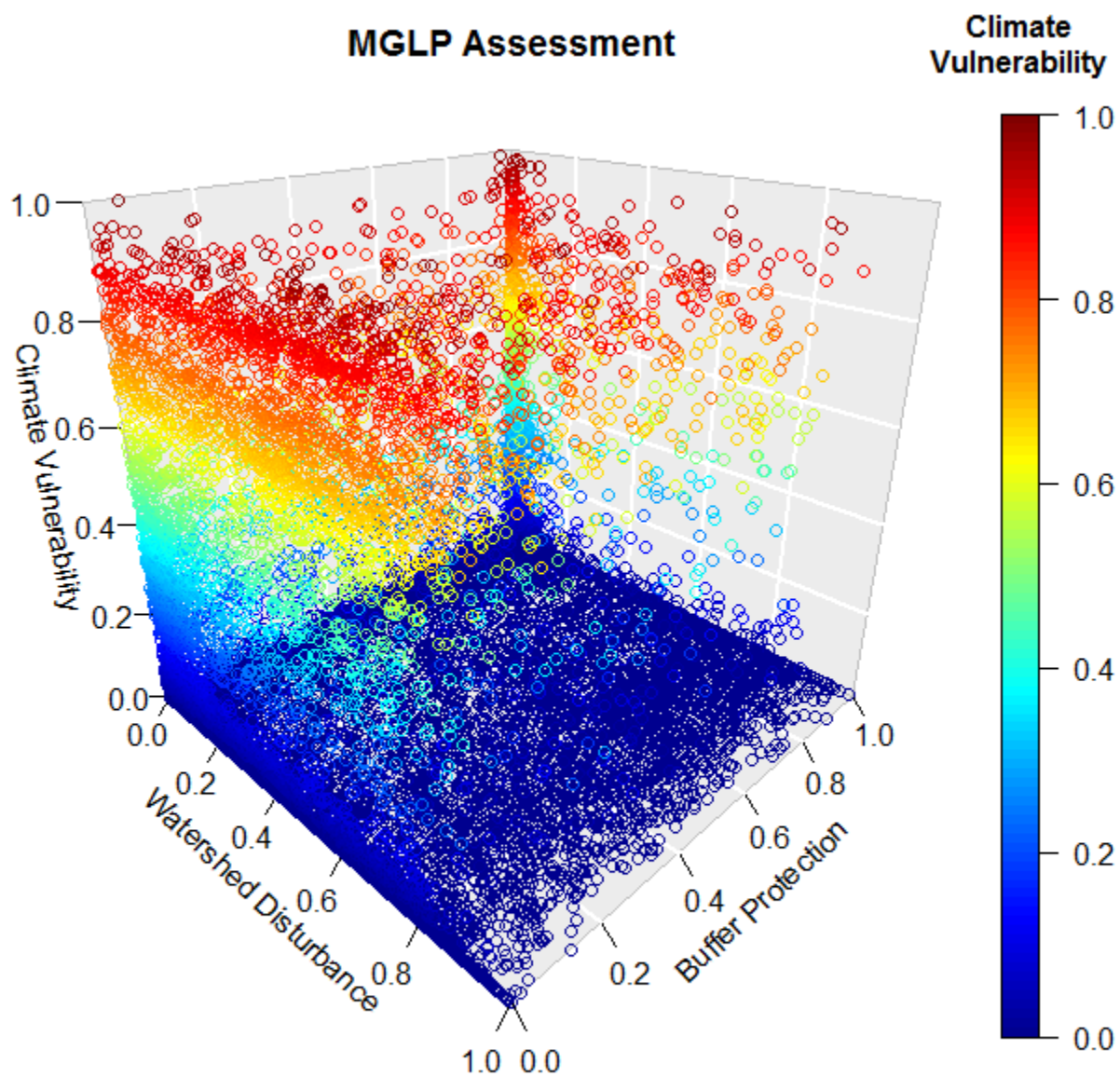
Prioritization



Strategies Matrix



MGLP Assessment



MIDWEST GLACIAL LAKES *Partnership*



IOWA DEPARTMENT OF
NATURAL RESOURCES



WISCONSIN
LAKES



What else are we doing?

- Aquatic Habitat Grant Program
- Wildlife Action Plan
- Monitoring for change
- Additional research



