Predicting who will oppose a project
& how attitudes change once a project is built

Sarah Mills, PhD
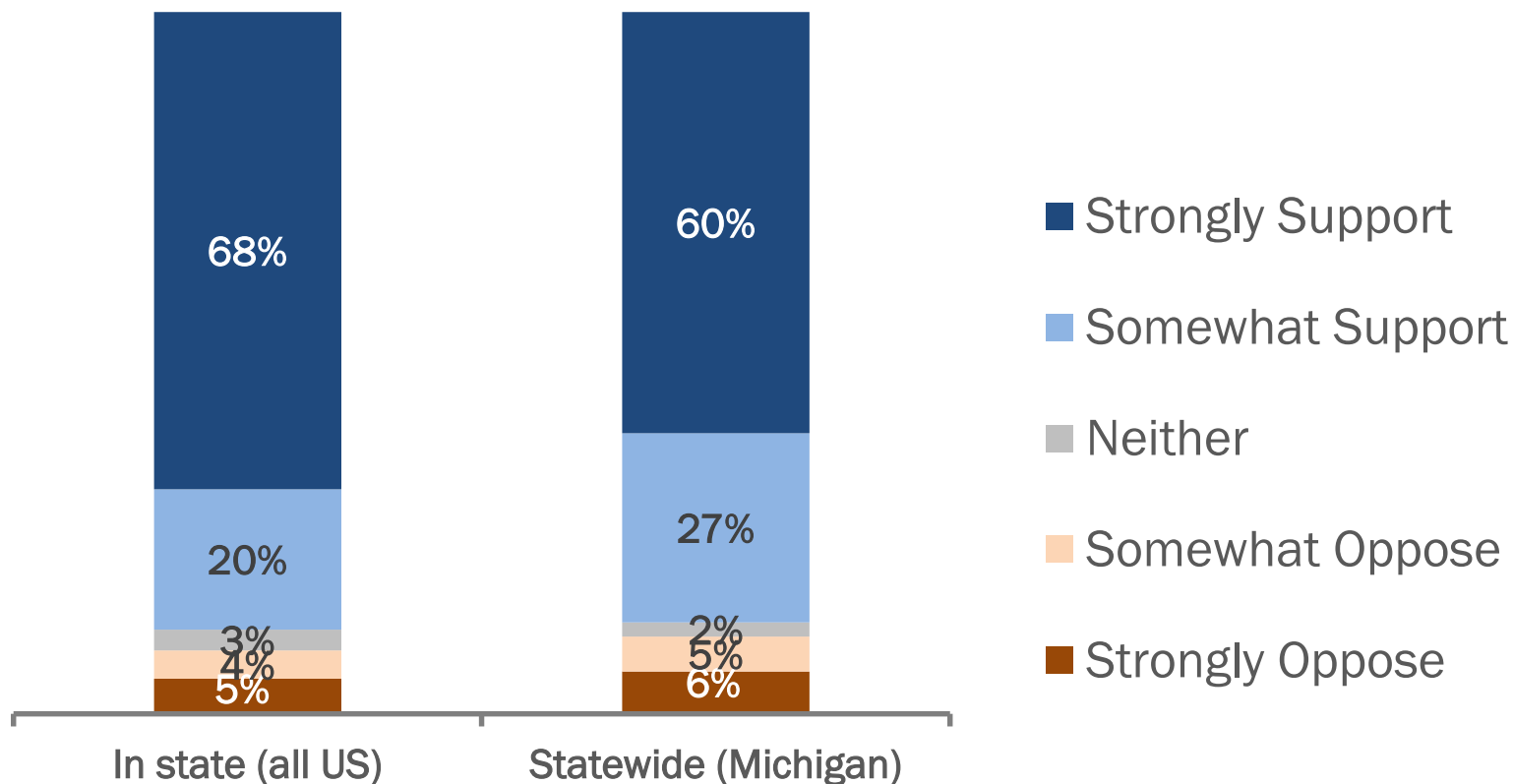
March 28, 2019

Overview

- Setting the stage: attitudes in Michigan

- Can you predict opposition?

- Attitudes over time

ATTITUDES ABOUT WIND ENERGY IN MICHIGAN

Support for increasing wind energy in state, US vs. MI

Sources: NSEE (2018). Findings from the Fall 2018 NSEE

Moore, S. & Anctil, A. (2018). Michigan's Energy Future: Expert and Public Opinion on Energy Transitions in Michigan,

Reactions to Wind in Michigan

Save the Huron Mountains

M | FORD SCHOOL

But not all opposition

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Understanding Community Response

Photo by Curt Nikisch

Scott Miller / CTV London

Assertion:
"Fit" Linked to Why You Live There

Photo: http://www.wjr.com/ag/
       Reddit link

Is this Pure Michigan to you?
This is what a Fortune 500 wind company would like to do to your community!

Too Many
Too Tall
Too Close

Huron Co, MI

RESEARCH PAPER #1:
CAN YOU PREDICT OPPOSITION?

Goal

- Can you predict where wind development will be contentious using publicly accessible datasets (U.S. Census, etc.)?

- Reduce wind development costs

- Minimize community conflict to save communities' some heartburn

Idea

- **Farmers** support wind development for economic reasons

- **Residential property characteristics** affect contention

- Socioeconomic and other **demographic factors** may influence wind siting

- Land use characteristics that result in **place attachment** within a community can create contention

Research Design

- 15 independent variables from:
  - USDA Census of Agriculture (county)
  - USDA Economic Research Service (county)
  - U.S. Census American Community Surveys (block group)
  - Townhall Presidential Election Data (county)

- Unit of Analysis: Existing windfarms in 4 Great Lakes States
  - IL, IN, MI, MN

Research Design

- Dependent variable: "Crowd-sourced" survey of wind development experts

- 46 respondents - 41% response rate

- 69 windfarms

Level of contention: Survey results	
Mean	2.88
Min	0.83
Max	7.67

Level of Contention (Page 1 of 2)

Least										Most
0	1	2	3	4	5	6	7	8	9	10

Amazon Wind Farm Fowler Ridge (Benton County, Pattern Energy Group) ☐ Don't Know

Correlations

Category	Factor	As factor ↑, Contention…
Agricultural characteristics	**Principal operators not residing on farm operated (%)**	↓
	Population employed in farming, fishing or forestry (%)	↑
	Size of farm	↓
	Population that worked at home (%)	↓
	Farm-dependent counties	↓
	Land in farms (%)	↓
Demographic information	Population that voted for Trump (%)	↓
	Population with a bachelor's degree or higher (%)	↓
	Median income (natural log)	↓
Land use characteristics	Population density	↑
	Natural amenity rank	↑
	Recreation-dependent counties	↑
Residential property characteristics	**Housing units moved into before 1980 (%)**	↑
	Households with retirement income (%)	↑
	Commute 40 minutes and up (%)	↓

When you account for interactions, what's most important?

- Ag characteristics
  - **% operators not on farm (1pt ↓: 7%)**
  - % work at home (1pt ↓: 14%)

- Demographics
  - % Trump voters (1pt ↓: 15%)

- Land Use Characteristics
  - **Natural amenity rank (1.5 pt ↑ : 1pt)**

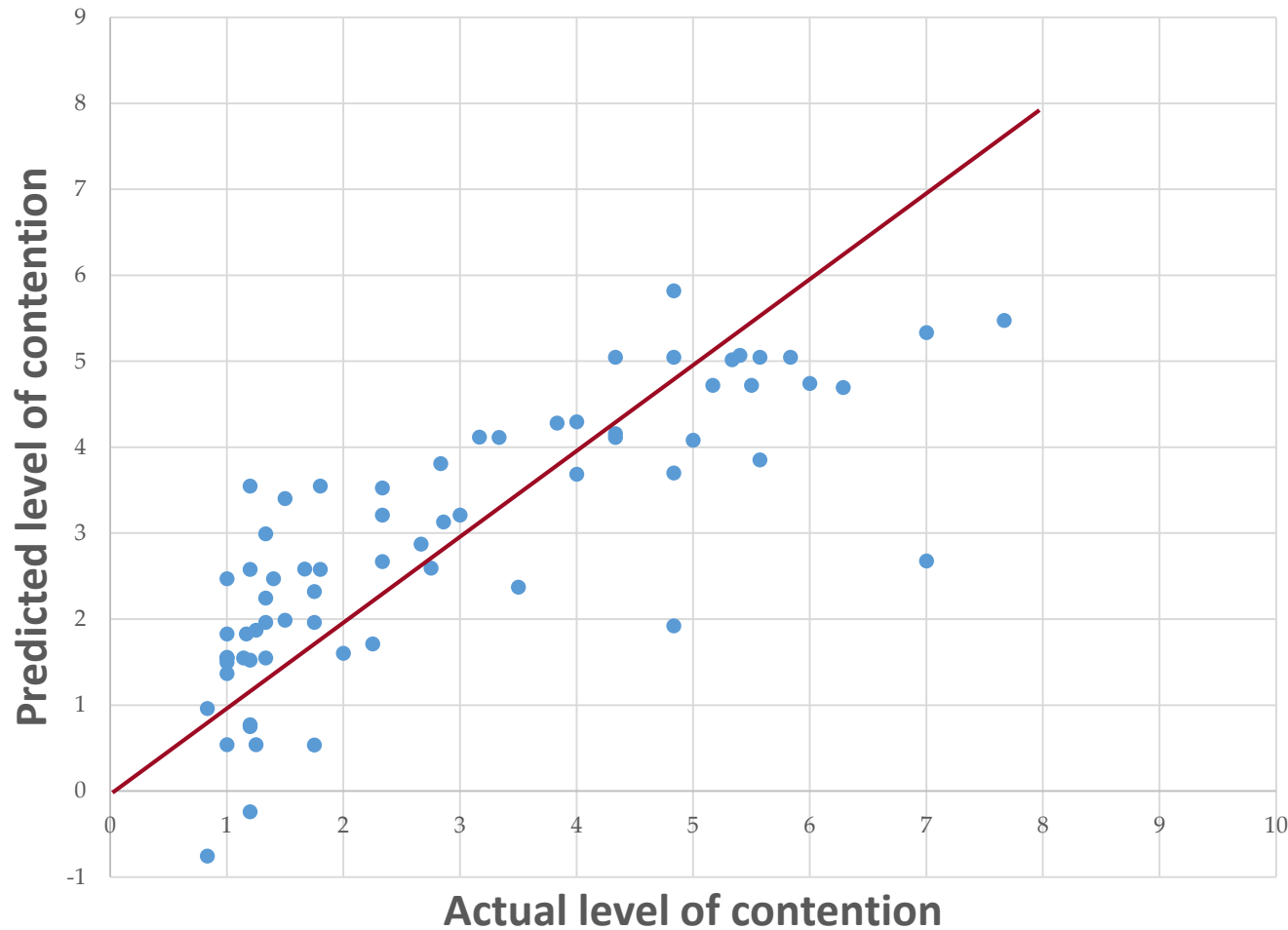# What is the Natural Amenities Scale?

Natural amenities scale

Standard deviations from mean

- Over 3 - High amenities
- 2 to 3
- 1 to 2
- 0 to 1
- 0 to -1
- -1 to -2
- Over -2 - Low amenities
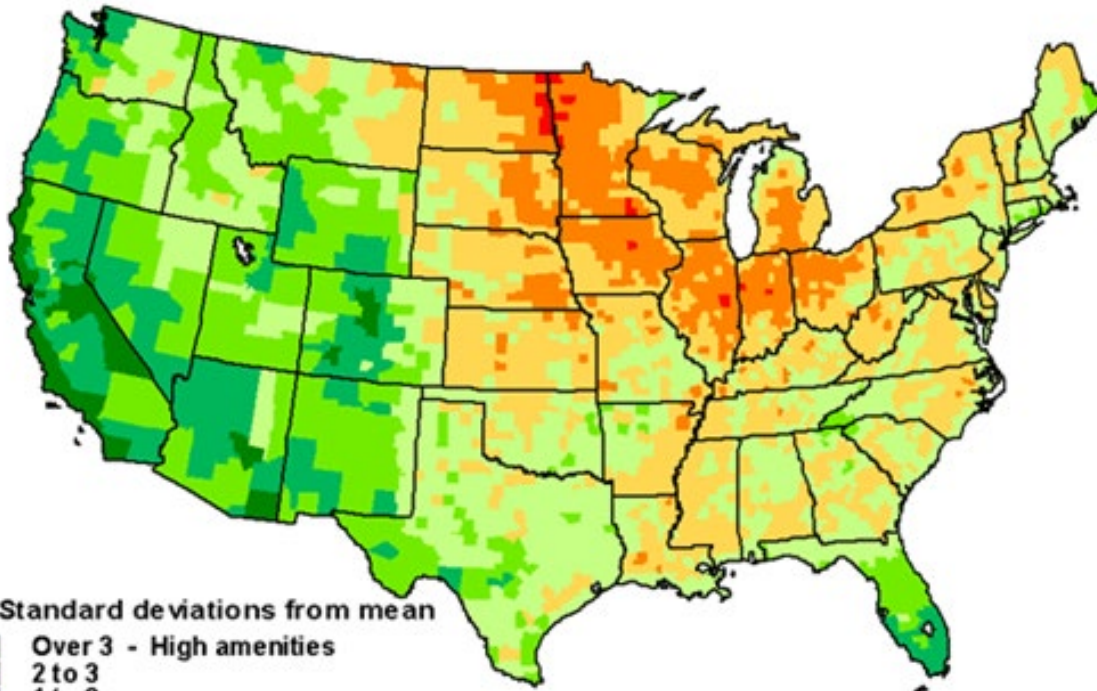
Source: USDA, Economic Research Service.

- Climate
- Topography
- Water area

https://www.ers.usda.gov/data-products/natural-amenities-scale/

Results:
Model Vs. Survey

±1 point
71% of the time

± 1.5 points
84% of the time

Discussion

- Outliers the result of:
  - wind developer activities?
  - other factors not captured & not easily measured?
    - Local government leadership's attitudes
    - "Instigators" or "champions"

- Would model improve with detail about ag, amenities at sub-county level?

Limitations and future research

- Poor response rate limits observations in IL

- Findings reflect constructed projects only, not proposed ones
  - Interested in collaborating?
  - Interest in nationwide survey?

- GIS analysis: how to represent the full spatial scale of wind turbines

- Student ground-truthing this summer in MI

Conclusions

- Ag characteristics, landscape amenities key drivers in Great Lakes region

- Suggests that why people live in that place matters to receptivity to wind; can pick this up with Census data

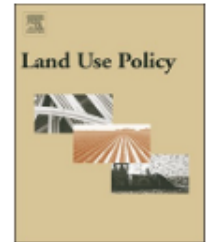- Definitely **not** substitute for on-the-ground engagement

RESEARCH PAPER #2:
LEARNING TO LIVE WITH TURBINES

The U-Curve Theory

- U-shaped curve
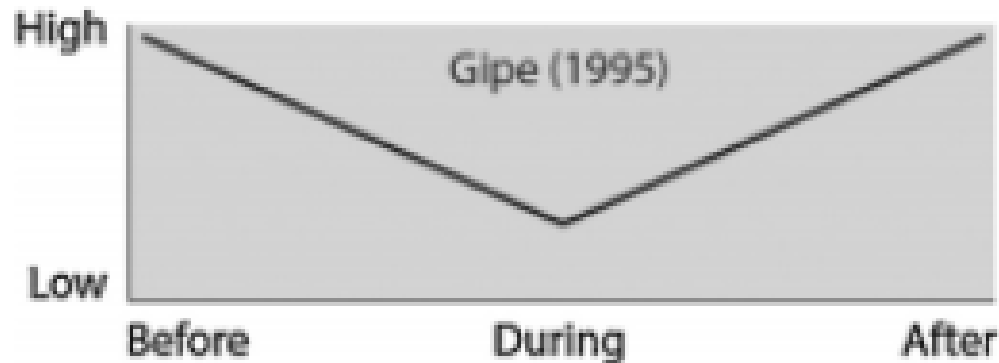
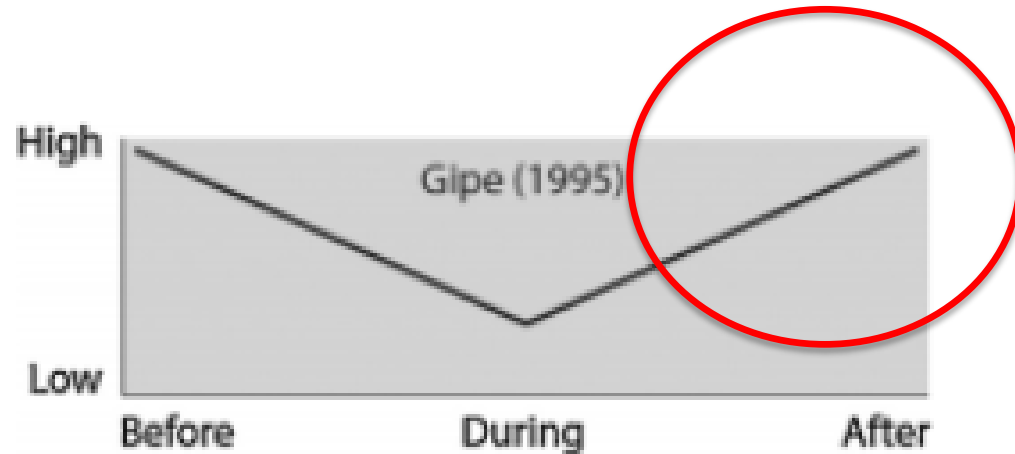- Two potential reasons: fears unfounded, with familiarity comes acceptance

Why Test it?

- Not much existing evidence, especially post-construction
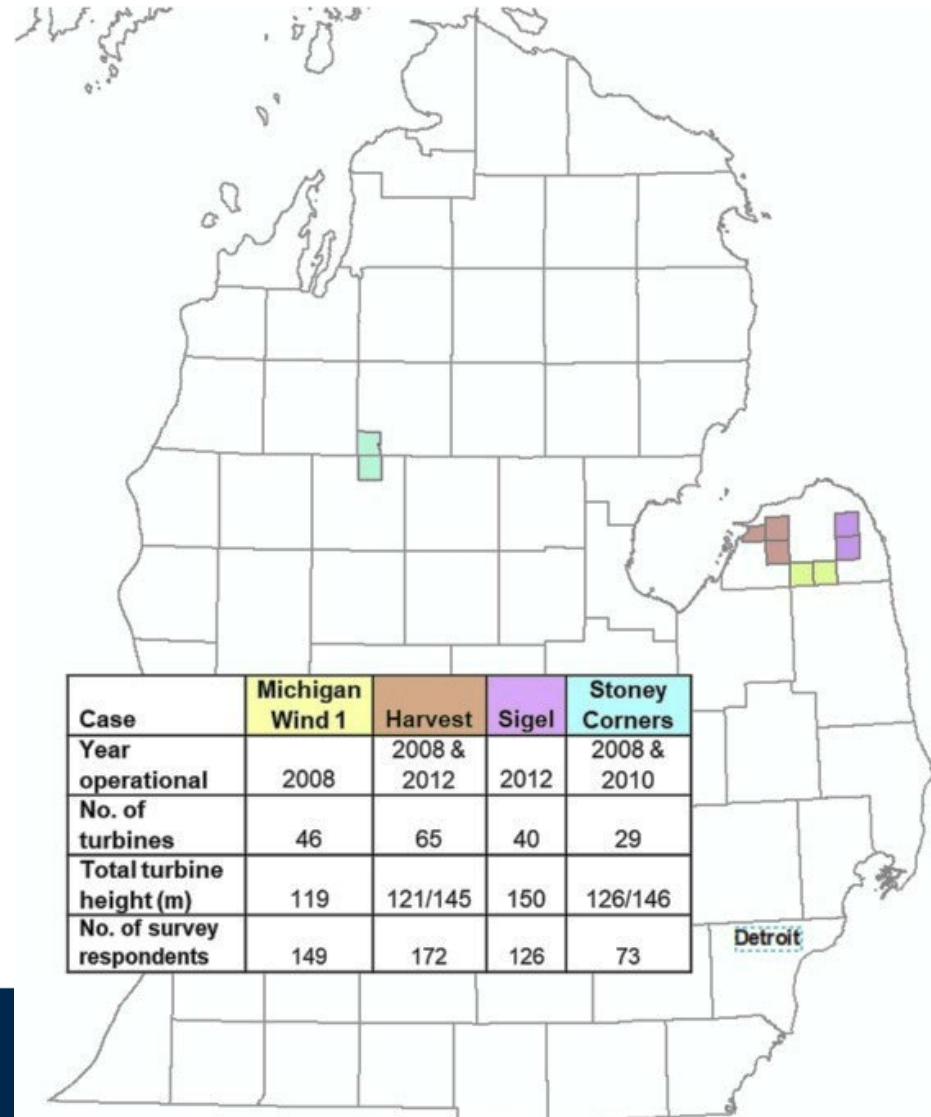
- Repowering, "referrals"

Our contribution

- Extended amount of time of operation, comparison of two points post-construction

- Impact of procedural justice?
  Direct payments?

Methods

- Two surveys of farmland owners
  - 2014, 2016

- DVs: 10 statements about benefits, impacts

- IVs: procedural justice (5 into 1); binary compensation

Case	Michigan Wind 1	Harvest	Sigel	Stoney Corners
Year operational	2008	2008 & 2012	2012	2008 & 2010
No. of turbines	46	65	40	29
Total turbine height (m)	119	121/145	150	126/146
No. of survey respondents	149	172	126	73

Detroit

10 IV Statements

Wind turbines...

    create jobs.

    provide revenue for land owners.

    preserve rural lands.

    help limit climate change.

    produce visual or aesthetic problems.

    create noise pollution.

    disrupt bird migration.

    disrupt local weather patterns.

    reduce nearby property values.

    cause human health problems.

Procedural Justice Items

- I had ample opportunity to provide input during the wind project planning stage.

- The wind project developer acted openly and transparently throughout the planning process.

- Community input influenced the outcome of the wind project (e.g., the location or number of turbines).

- Local government officials' decisions about the wind project were in the best interests of our township.

- The wind developer did not keep the promises they made during the planning process (inverted).

Results – In Aggregate

Wind turbines...

create jobs.

provide revenue for land owners.

Net agreement

preserve rural lands.

help limit climate change.

produce visual or aesthetic problems.

create noise pollution.

disrupt bird migration.

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cause human health problems.

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Net disagreement

Results – In Aggregate

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35% - 55% changed opinion, but roughly equal directions EXCEPT

More agreement with these statements in '16

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Results – By Process Fairness

- Those who think process fair
  - Agree with most positive statements
  - Disagree with all negative statements
  - Attitudes more positive over time (3)

- Those who think process unfair
  - Agree with 2 positive statements
  - Agree with most negative statements (3, 5 of 6)
  - Attitudes more negative over time (6)

Results Summary

- Attitudes intensify, diverge over time

- Attitudes about process fairness stronger than payment—but linked

Implications for Practice, Research

- Process matters for long-haul
  - For repowering
  - For referrals

- Process = Not just what's on the books
  - Developer attitudes
  - Local official responsiveness

- UM/MSU trying to pilot proactive, inclusive planning

Thank you & questions

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