

# SPATIALLY LINKING RECREATION SUPPLY, DEMAND AND CONSTRAINTS

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# RECREATION EXPERIENCES



- Recreation Experience Model
  - Recreationists conduct desired *activities* in preferred *settings* to realize particular experiences

## LINKING SUPPLY.....

- Where they are recreating:
  - Recreation opportunity settings are the biophysical, social, and managerial environments necessary to achieve the experience
  - Land managers have control over many of the characteristics of the settings, thus providing the supply of recreation opportunities
  - Multiple Federal and State agencies, municipal offerings, private and non-profit

## ....AND DEMAND

- To supply the amount and types of recreation opportunities that people want, you have to know....
  - Desired activities
  - Preferred settings
    - How they combine these to achieve particular experiences?
  - How often they go?
  - Where specifically they go?
  - What is keeping them from going as often as they like?

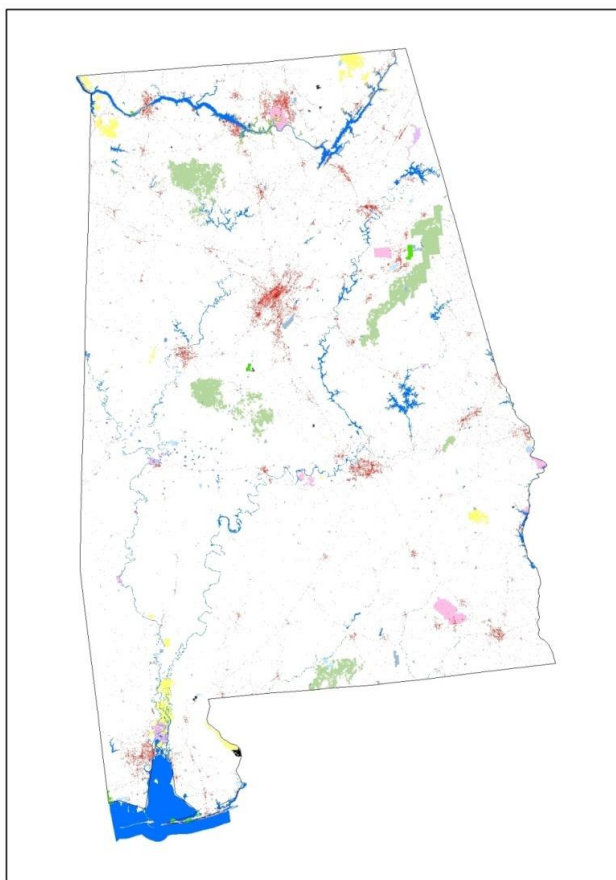
# WHY IS INTEGRATING SUPPLY AND DEMAND IMPORTANT?

- Provide information to local land managers at a scale useful to them
- Facilitate regional or system-wide planning
- Identification of displacement issues and substitute sites
- Defend decision making
- Justify funding
- Meet legislative requirements



# ALABAMA: RECREATION OPPORTUNITIES

- Spatially explicit
- Multiple agencies
- Many different opportunity settings



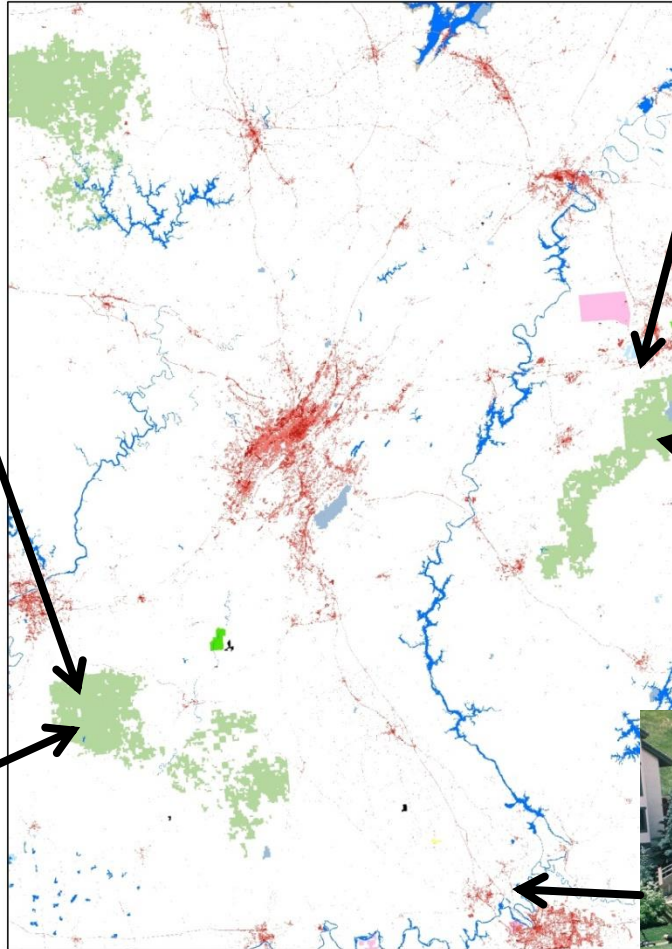
## Ownership (Stewardship)

■	Tennessee Valley Authority (TVA)
■	Bureau of Land Management (BLM) or Bureau of Reclamation (BOR)
■	Fish & Wildlife Service (FWS)
■	Forest Service (USFS)
■	Department of Defense (DOD) & Department of Energy (DOE)
■	National Park Service (NPS)
■	Natural Resources Conservation Service (NRCS) or Agricultural Research Service (ARS)
■	Bureau of Indian Affairs (BIA)
■	National Oceanic & Atmospheric Administration (NOAA)
■	Other Federal Land
■	Native American Land
■	State Parks & Recreation Area
■	State Land Board & State School Land
■	State Wildlife Reserves
■	Other State Land
■	State Forest
■	State Coastal Reserve
■	State Natural or Cultural Preserve
■	State Department of Agriculture
■	City, County or Regional Government Land
■	Non-Governmental Conservation Organization
■	Private Land Unrestricted for Development/ No Known Restriction
■	Water
■	Unknown



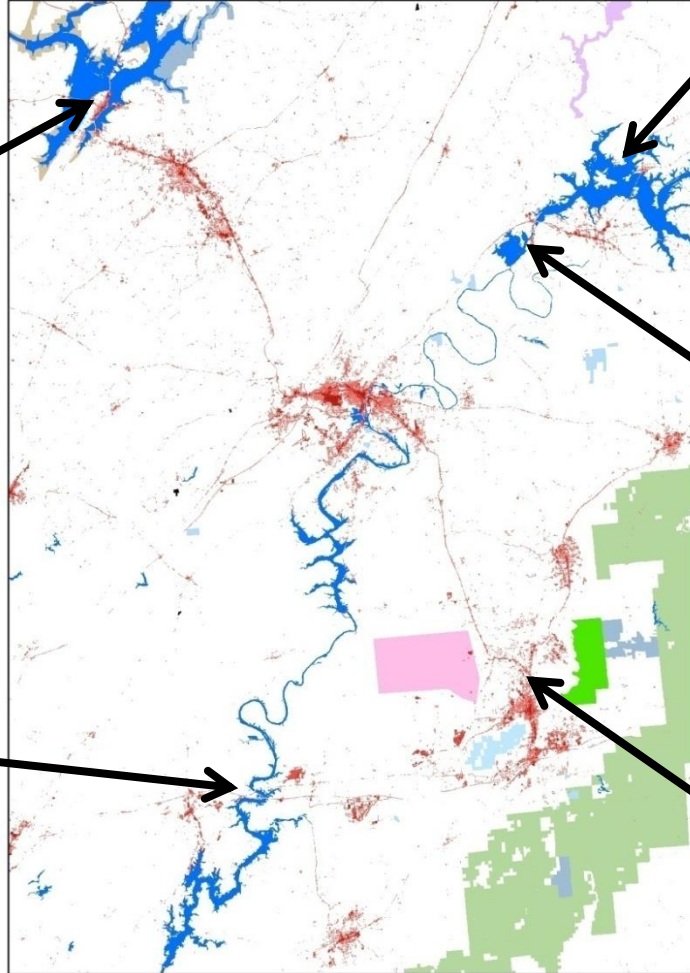
# DID YOU GO MOUNTAIN BIKING LAST YEAR?

## MOUNTAIN BIKING ACTIVITY/ SETTING OPPORTUNITIES



# DID YOU GO FISHING LAST YEAR?

FISHING ACTIVITY/  
SETTING OPPORTUNITIES





## SUPPLY....

- Standardized inventory mapping.....
  - Recreation Opportunity Spectrum (ROS)
    - Biophysical, social, managerial
  - Southern Appalachian Assessment (SAA)
    - Standardized, facility inventory across all sites
  - Statewide Comprehensive Outdoor Recreation Plan (SCORP)
    - Variable, across all land management
  - Protected Areas Database – United States (PAD-US)

## ...AND DEMAND

### ■ A number of reliable sources on demand:

#### 1. National Survey on Recreation and the Environment (NSRE)

- 1974 RPA – 2013?
- Core of activity participation and demographics
- Additional modules
- National, regional, state, MSA

#### 2. National Visitor Use Monitoring (NVUM)

- Visits, satisfaction
- Forest Service lands, national

#### 3. National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (NSFHWR)

- Wildlife related activities and expenditures
- National, state

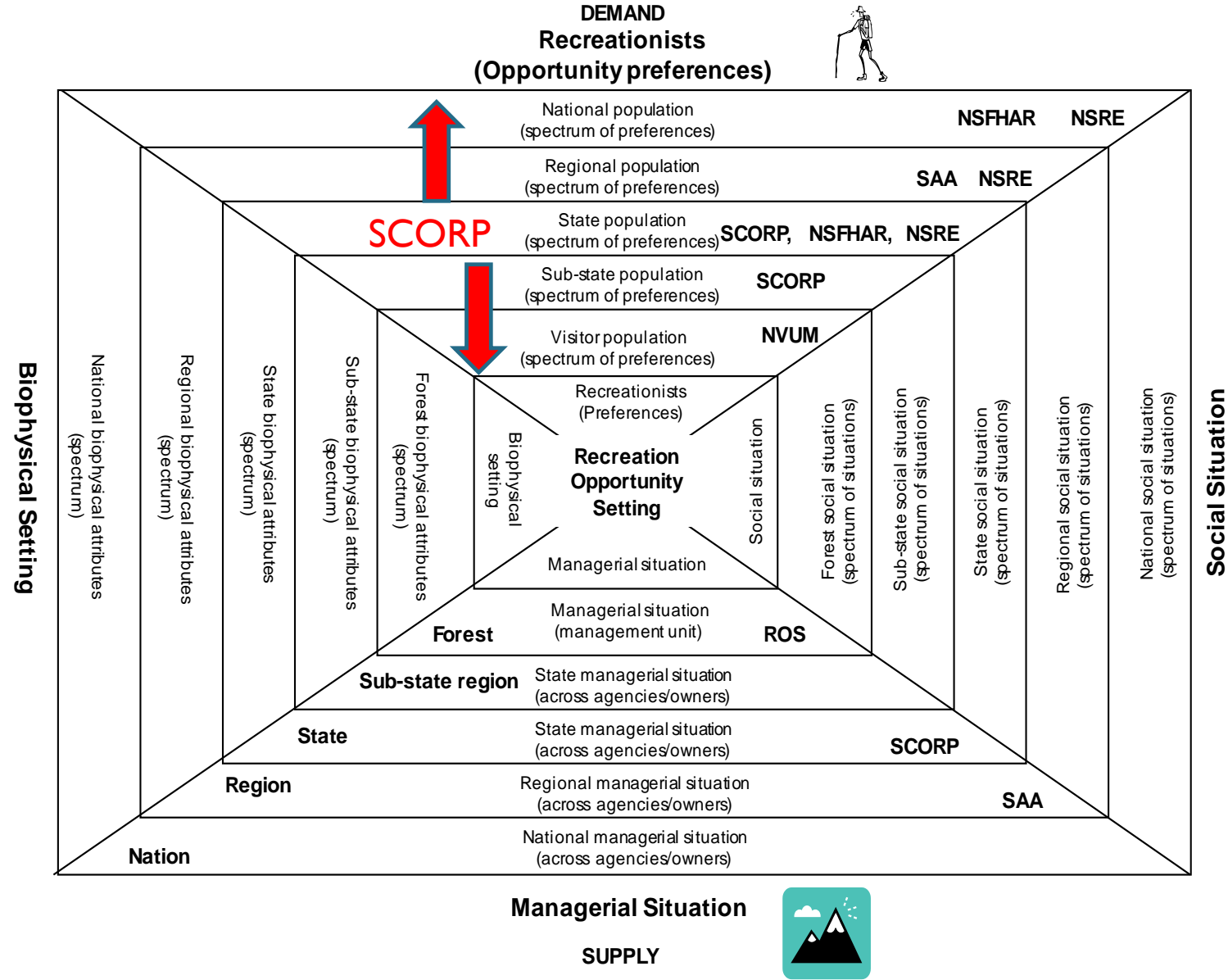
#### 4. Statewide Comprehensive Outdoor Recreation Plan (SCORP)

- Supply and demand
- 1965 Land and Water Conservation Fund Act

#### 5. Site studies

- Good examples of link (Economic studies; Rosemberger and Loomis 2001)
- Preference studies (Heywood 1991, Pierskalla et al. 2004, Lawsone & Manning 2002, Lindberg & Fredman 2005)

Figure 1: Recreation Supply and Demand



# SCORP: REQUIREMENTS AND BEST PRACTICES

## ■ NPS Land and Water Conservation Fund

- The LWCF Act of 1965 enacted "...to assist in preserving, developing, and assuring accessibility to all citizens ...such quality and quantity of outdoor recreation resources as may be available and are necessary and desirable for individual active participation in such recreation and to strengthen the health and vitality of the citizens of the United States" (NPS ch I-1, 2008)

## ■ SCORP

- A SCORP program evaluates the demand and supply of public outdoor recreation resources throughout a State, identifies capital investment priorities for acquiring, developing, and protecting all types of outdoor recreation resources, assures continuing opportunity for local units of government and private citizens to take part in planning for statewide outdoor recreation, and coordinates all outdoor recreation programs throughout the State.

# SCORP: REQUIREMENTS AND BEST PRACTICES

## ■ **Minimum Requirements**

- Public participation
- Identifies recreation issues
- Evaluates demand
- Evaluates supply
- Identifies priority needs
  - Have an implementation program that identifies the State's strategies, priorities, and actions for the obligation of its LWCF apportionment. (OPSP)
- Have a wetlands component



# SCORP: REQUIREMENTS AND BEST PRACTICES

## ■ **America's Great Outdoors Initiative**

- Develop urban parks and green spaces
- Link people to recreation opportunities (trails, corridors, sidewalks)
- Linked to public health\*

## ■ **National Association of Recreation and Resource Planners: Reframing the role and relevance of SCORP**

- Collaborative planning team (including federal agencies)
- Evaluates supply (*GIS spatial analysis/database*)
- Landscape planning: Wildlife, watershed, economic development
- Health and urban\*\*

## ■ **Oregon and Wisconsin SCORP**

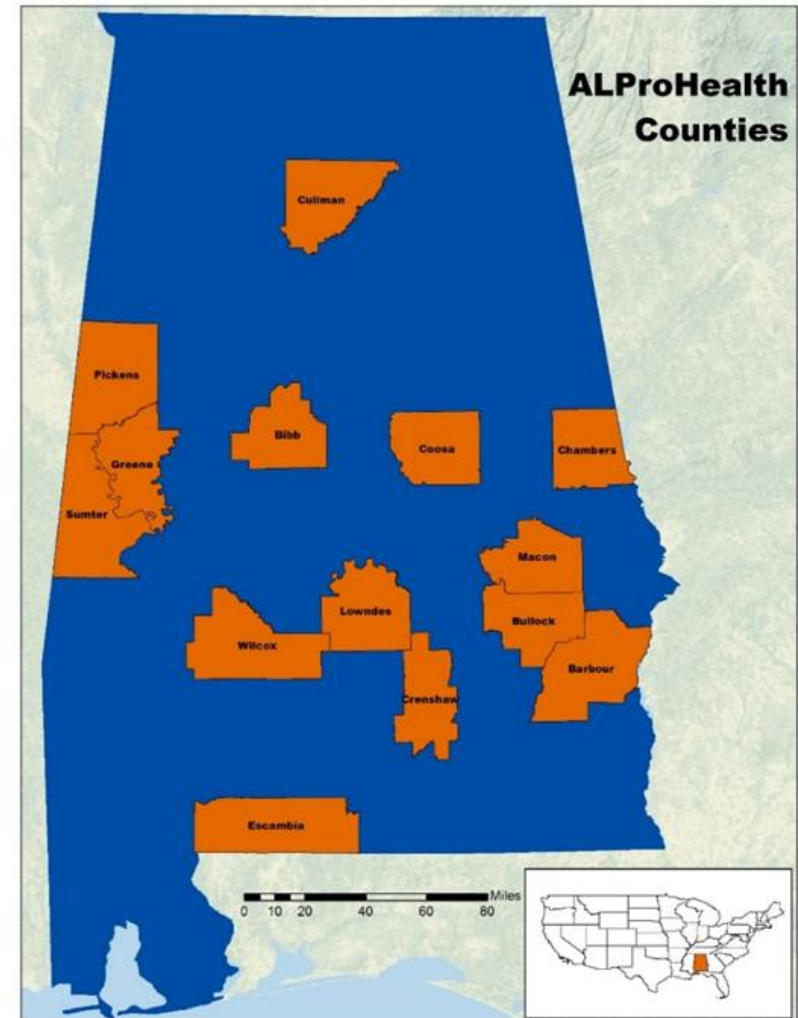
- Demand at county level
- Supply municipal level
- Health focus\*\*
- Demographic/disadvantaged

# ORGANIZING FRAMEWORK: BASE FOR CDC PROJECT

- **Recreation data collection strategy: SCORP +**
  - Collaborative planning team (including federal agencies)
  - Public participation\*\*
  - Identifies recreation issues (providers, users)
  - Evaluates demand (by spatial setting type; county level)\*\*
  - Evaluates supply (GIS spatial analysis/database; municipal level)\*\*
  - Identifies priority needs (OPSP)\*\*
  - Have a wetlands component
  - Consider urban parks and green spaces\*\*
  - Link people to recreation opportunities\*\*
  - Linked to public health\*\*
  - Landscape planning: Wildlife, watershed, economic development
  - Demographic/disadvantaged\*\*
  - Constraints\*\*

# ALABAMA: CDC GRANT

- **ALProHealth:** Alabama Preventing and Reducing Obesity – Helping to Engage Alabamians for Long-Term Health
- 4-year project funded by the Centers for Disease Control and Prevention
  - Currently in Y4
- Working with community coalitions in 14 counties with adult obesity rates greater than 40%
- Implementing research-based interventions proven to reduce obesity
- 3-prong approach
  - Nutrition Education
  - Food Retail
  - Physical Activity



# NEEDS ASSESSMENT

- **Focus groups with community coalitions**
  - Community coalitions made up of local leaders
  - Questions regarding the health of the local community
- **Mail survey to general population**
  - Modeled after NSRE, SCORP, and AGO/SORP recommendations (as described)
  - Elicited responses regarding access to outdoor recreation locations and healthy food sources
  - Outdoor recreation activity participation
  - Community needs for improving outdoor recreation
  - Constraints to participation in outdoor recreation
  - GIS techniques can be utilized to **highlight spatial patterns** of demand, needs, and constraints

## 2016 OUTDOOR RECREATION AND FOOD ACCESS SURVEY

UNDERSTANDING YOUR PARTICIPATION IN OUTDOOR RECREATION ACTIVITIES  
AND YOUR ACCESS TO FOOD



A STUDY BY:  
ALABAMA COOPERATIVE EXTENSION SYSTEM  
AND  
THE SCHOOL OF FORESTRY AND WILDLIFE SCIENCES AT AUBURN UNIVERSITY

# RESPONSE RATE

- Sent to 500 random households in 16 counties
- 8,000 total surveys mailed
- Response rate
  - **1,448 total returned**
  - 1,397 returned questionnaires
  - 51 online responses
  - 605 non-deliverable addresses
  - $\frac{1,448 \text{ (usable responses)}}{7,395 \text{ (deliverable addresses)}} \times 100 = \mathbf{19.6\% \text{ response rate}}$

## ◆ DIRECTIONS ◆

In the following tables, approximate the number of times you or anyone in your household participated in any of the following outdoor recreation activities in the past 12 months.

**\*\*\*Most people will not have participated in many of the following activities, so you will likely skip many of the following sections.\*\*\***

- The first column identifies a specific activity.
- Please use the 2<sup>nd</sup> column to indicate how many times you or anyone in your household participated in the listed activity less than a 1-hour drive from your home.
- Please use the 3<sup>rd</sup> column to indicate how many times you drove more than 1 hour for the listed activity.

7. Did you or anyone in your household participate in any of the common outdoor activities listed in the table below in the past 12 months?

Yes  No (if no, skip to question #8)

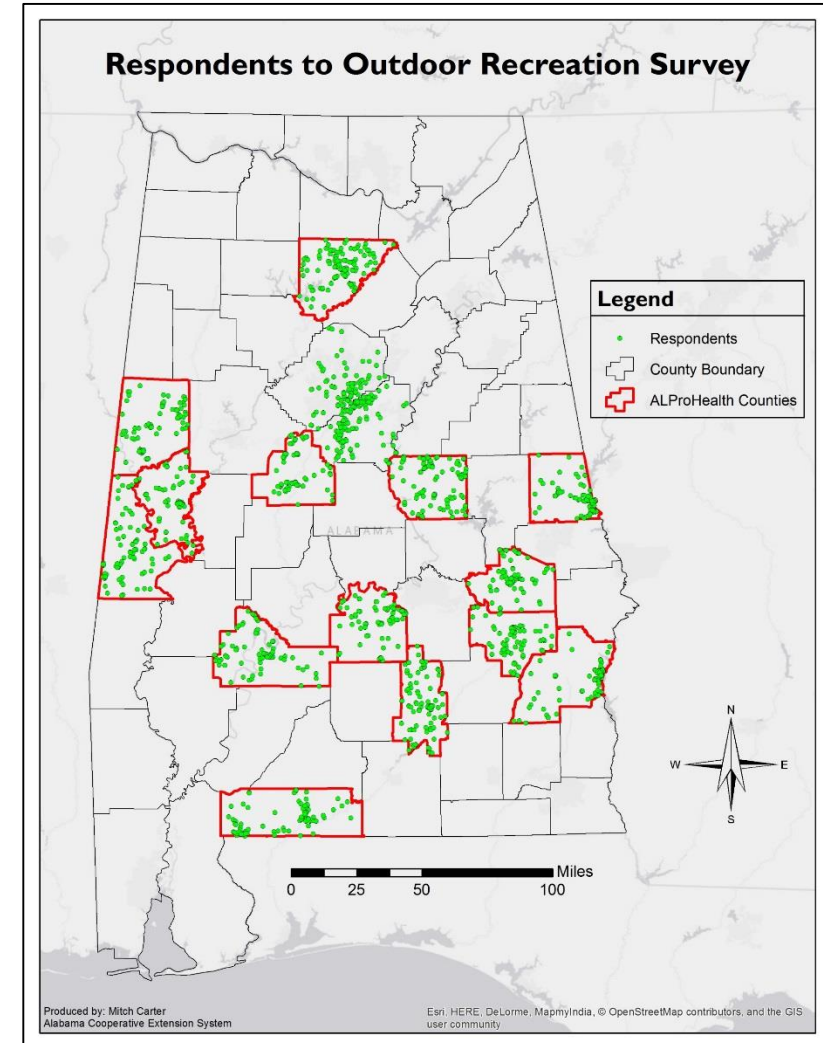
Outdoor activities	Approximate # of times <u>less than 1 hour</u> from home	Approximate # of times <u>more than 1 hour</u> from home
Walking/jogging on sidewalks or streets for pleasure or exercise		
Sightseeing or driving for pleasure		
Picnicking		
Gathering with family or friends in a park or other outdoor venue		
Gardening or landscaping		
Attending outdoor concerts, fairs, or festivals		
Dog walking or visiting a dog park		
General play at a park or playground		
Skateboarding, inline skating, or roller skating		
Visiting historic sites or other historic parks		
Swimming in an outdoor pool		



# RESPONSE RATE BY COUNTY

County	Number of Responses
Barbour	92
Bibb	66
Bullock	91
Chambers	88
Coosa	101
Crenshaw	100
Cullman	112
Escambia	93
Greene	80
Lowndes	74
Macon	89
Pickens	83
Sumter	87
Wilcox	87
Jefferson (non-ALProHealth)	76
Shelby (non-ALProHealth)	130

Average responses per county = 91



# RESULTS:ACTIVITY PARTICIPATION (DEMAND)

Top outdoor recreation activities by participation in the last 12 months:

<b>Activity</b>	<b>Percent Participation</b>
Walking on sidewalks or streets for pleasure	57.8%
Gardening or landscaping	56.7%
Gathering with family or friends at a park	54.2%
Freshwater fishing	49.1%
Visiting an ocean or beach	44.5%



# RESULTS: DEMAND FOR FUTURE PROJECTS (NEEDS)

Top demands for potential community projects to see in the future:

<b>Project</b>	<b>Average [1(low) – 5(high)]</b>
Maintenance of existing park and recreation facilities	3.94
Playgrounds for children	3.85
Paved walking trails and paths	3.63
Natural surface walking/hiking trails and paths	3.6
Picnic areas and pavilions/shelters	3.58



# RESULTS: CONSTRAINTS TO OUTDOOR RECREATION

Top reasons for limiting participation in outdoor recreation:

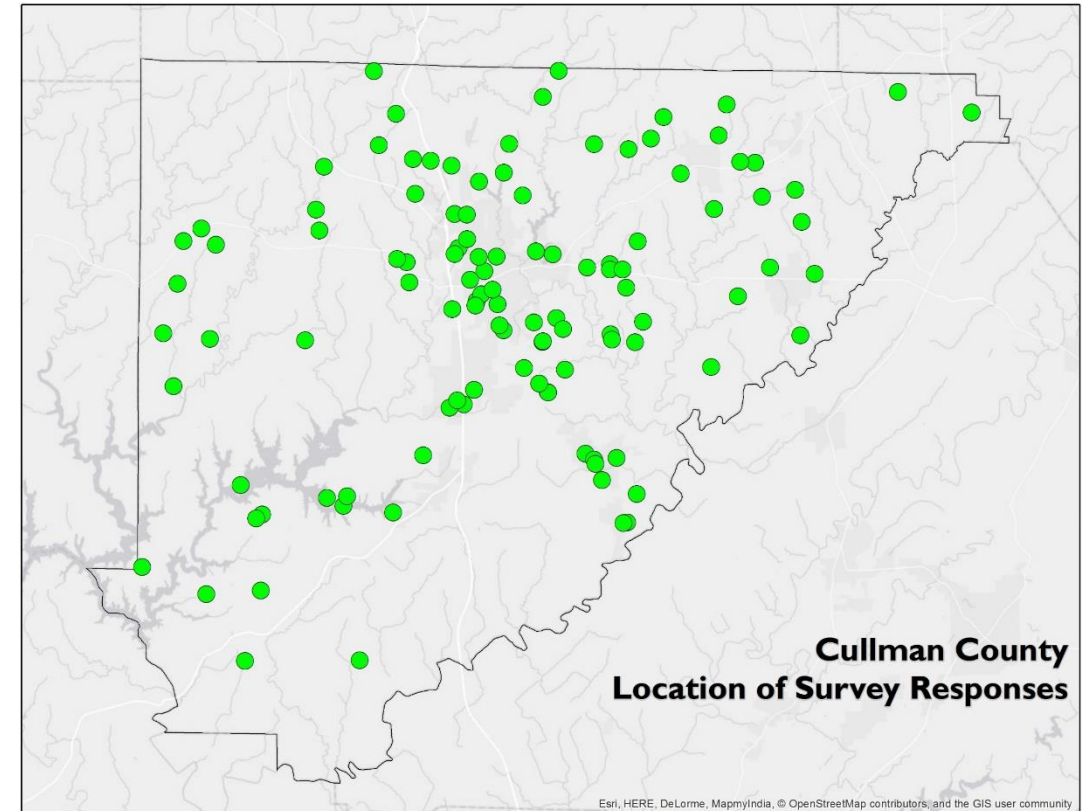
<b>Barrier</b>	<b>Average [1(low) – 5(high)]</b>
Not enough time; too busy with family, work, or other duties	3.38
Travel distance; not enough nearby facilities	3.18
High fees	2.87
Health concerns	2.76
Overcrowding	2.59





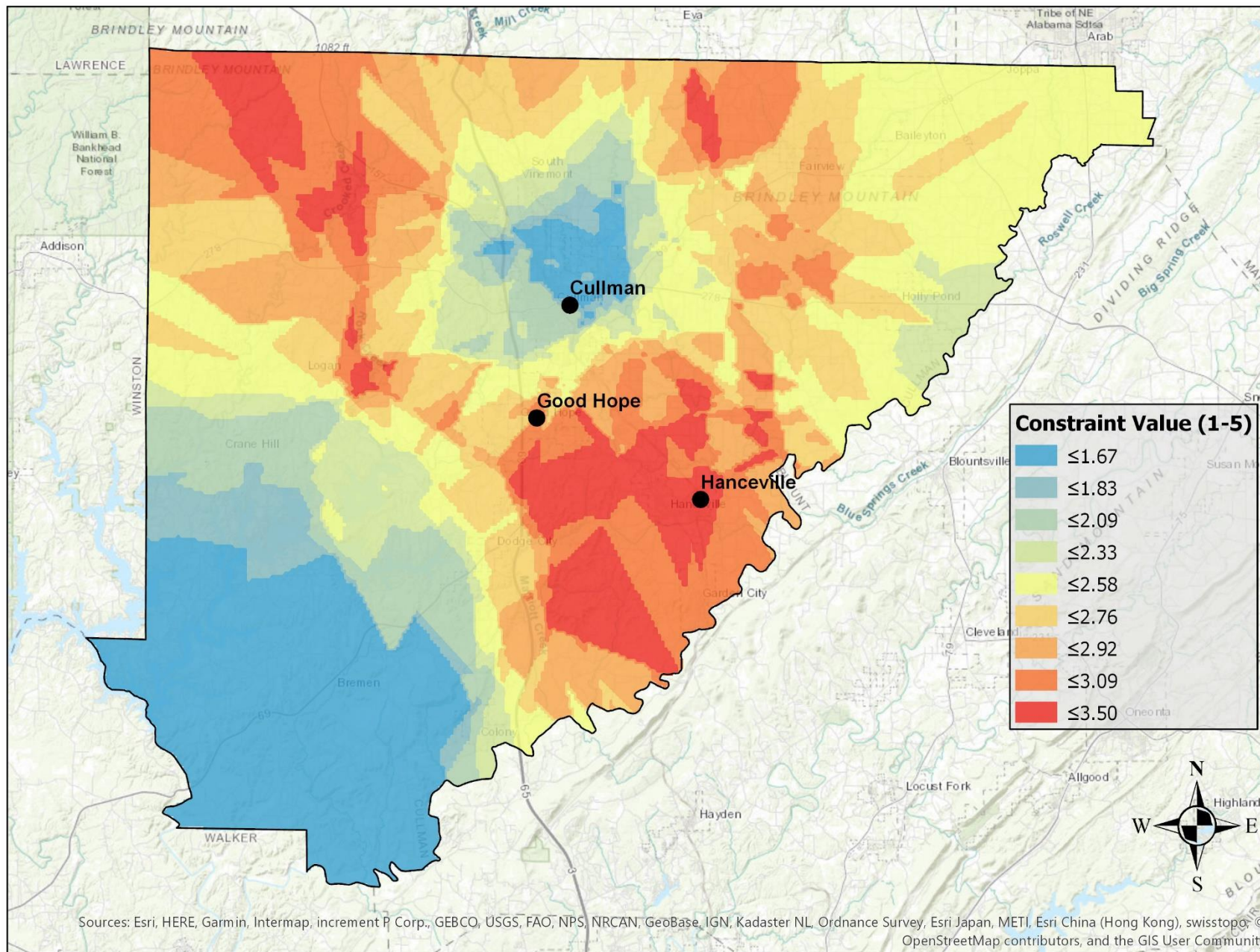
# RESULTS

- How can spatial analysis help?
  - Each survey is tied to a geographic location (home address)
  - Large enough samples allow for generalizations to be made based on survey responses
  - We can utilize spatial analysis to:
    - Identify which barriers to outdoor recreation are strongest in an area
    - Identify potential projects that would be most strongly supported in an area
    - Identify locations of trends in participation of certain activities





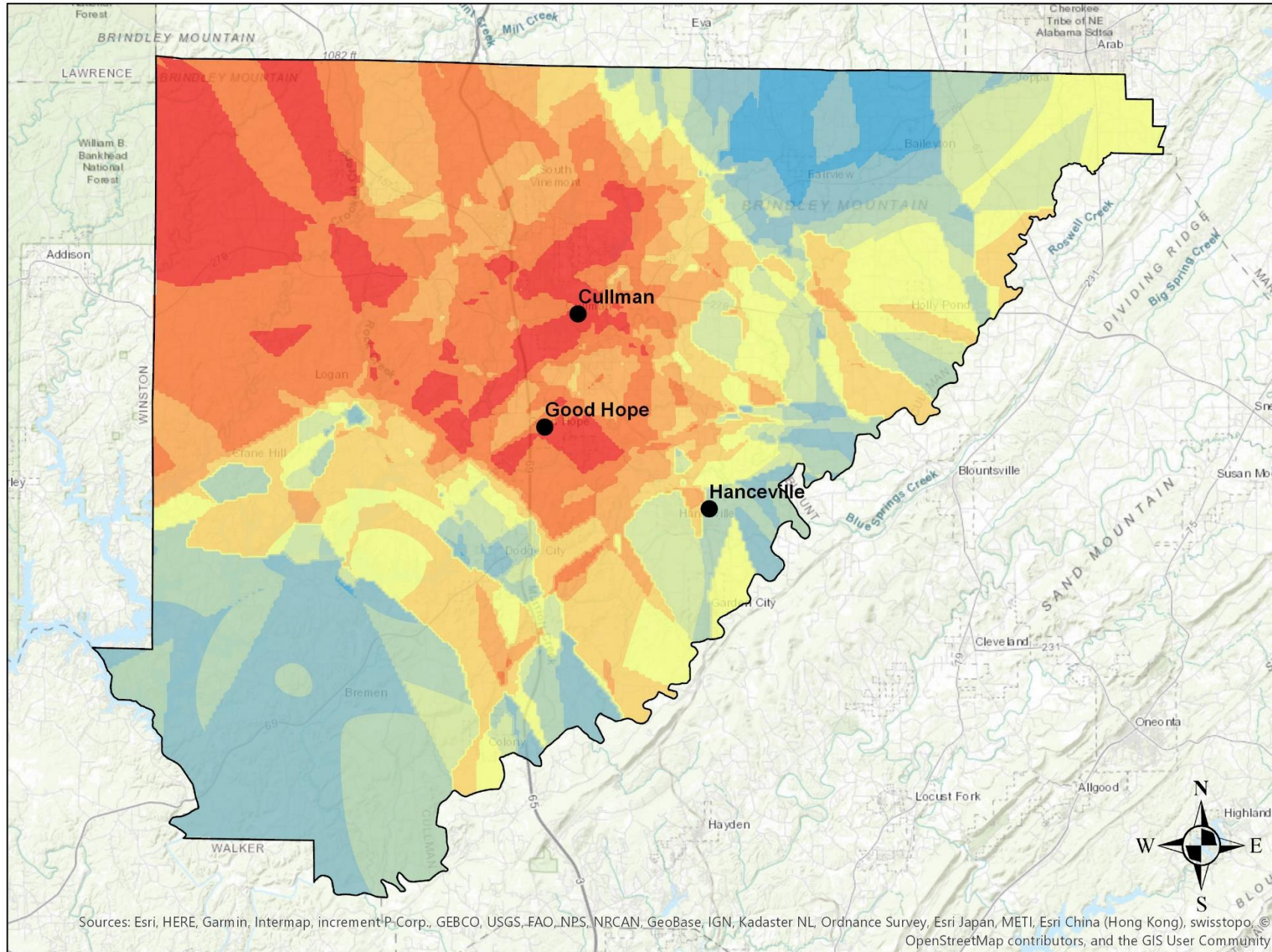
# Constraint to Outdoor Recreation: Not enough nearby facilities



0 2.5 5 10 15 20 Miles

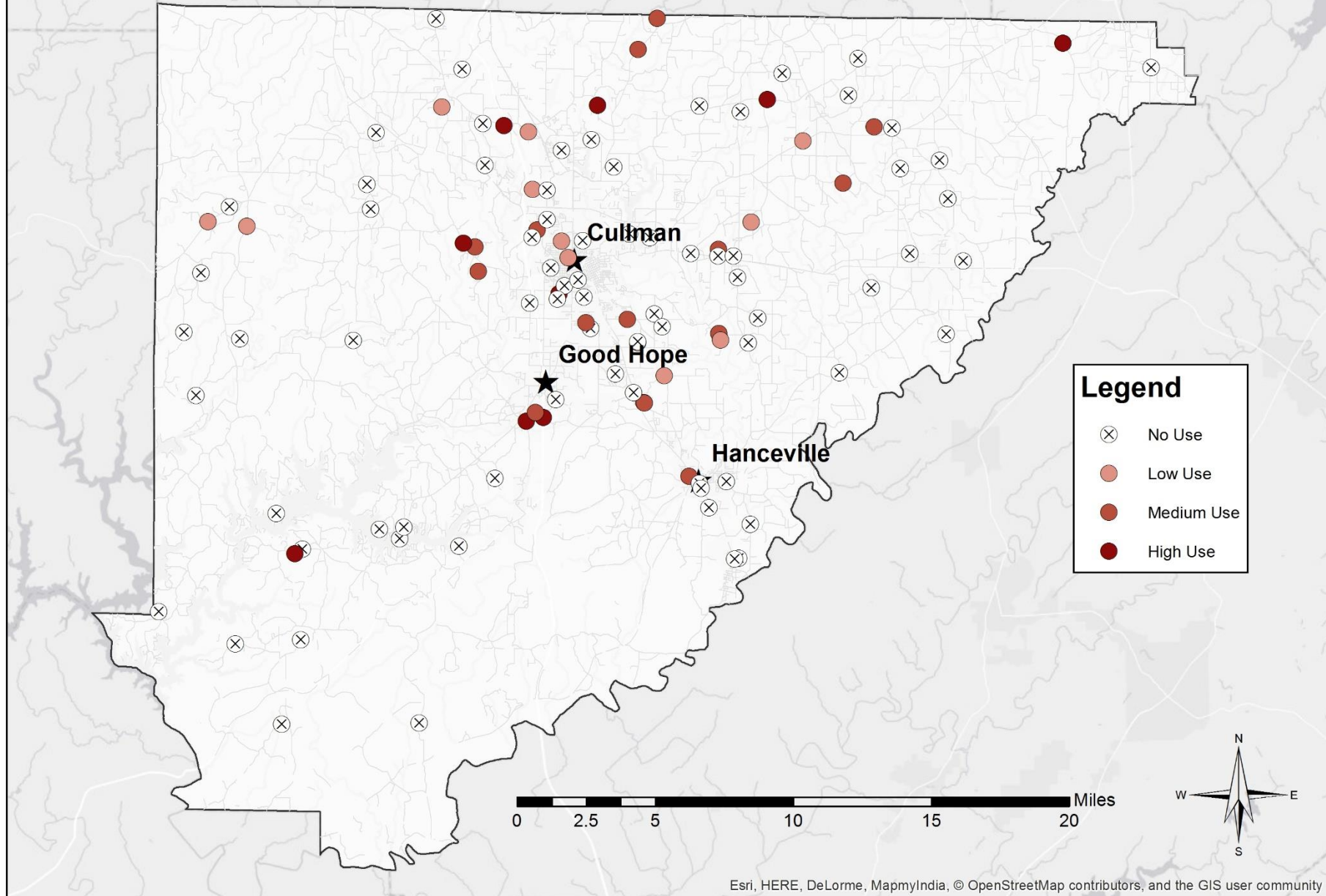


# Priority for Potential Community Projects: Paved Walking Trails



# Cullman County

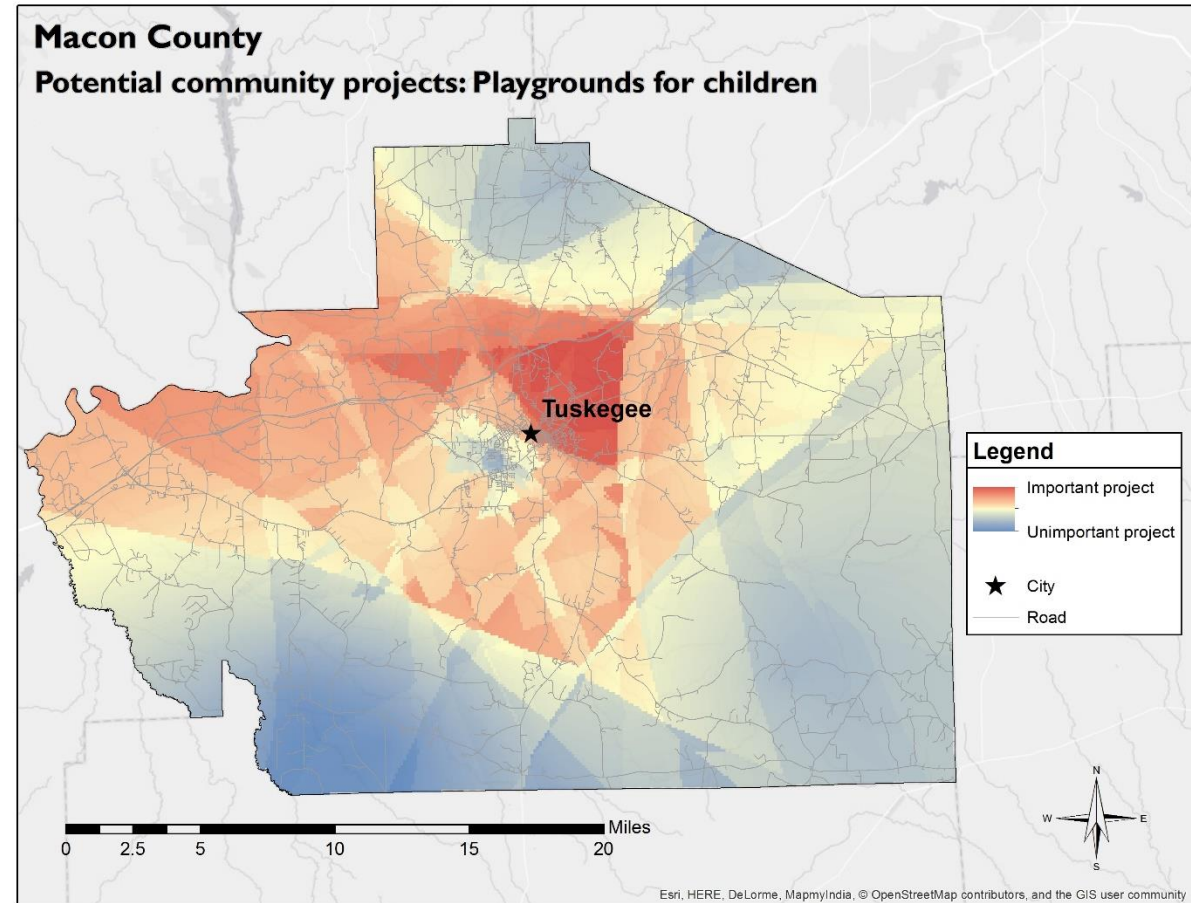
## Level of Use: General play at a park or playground





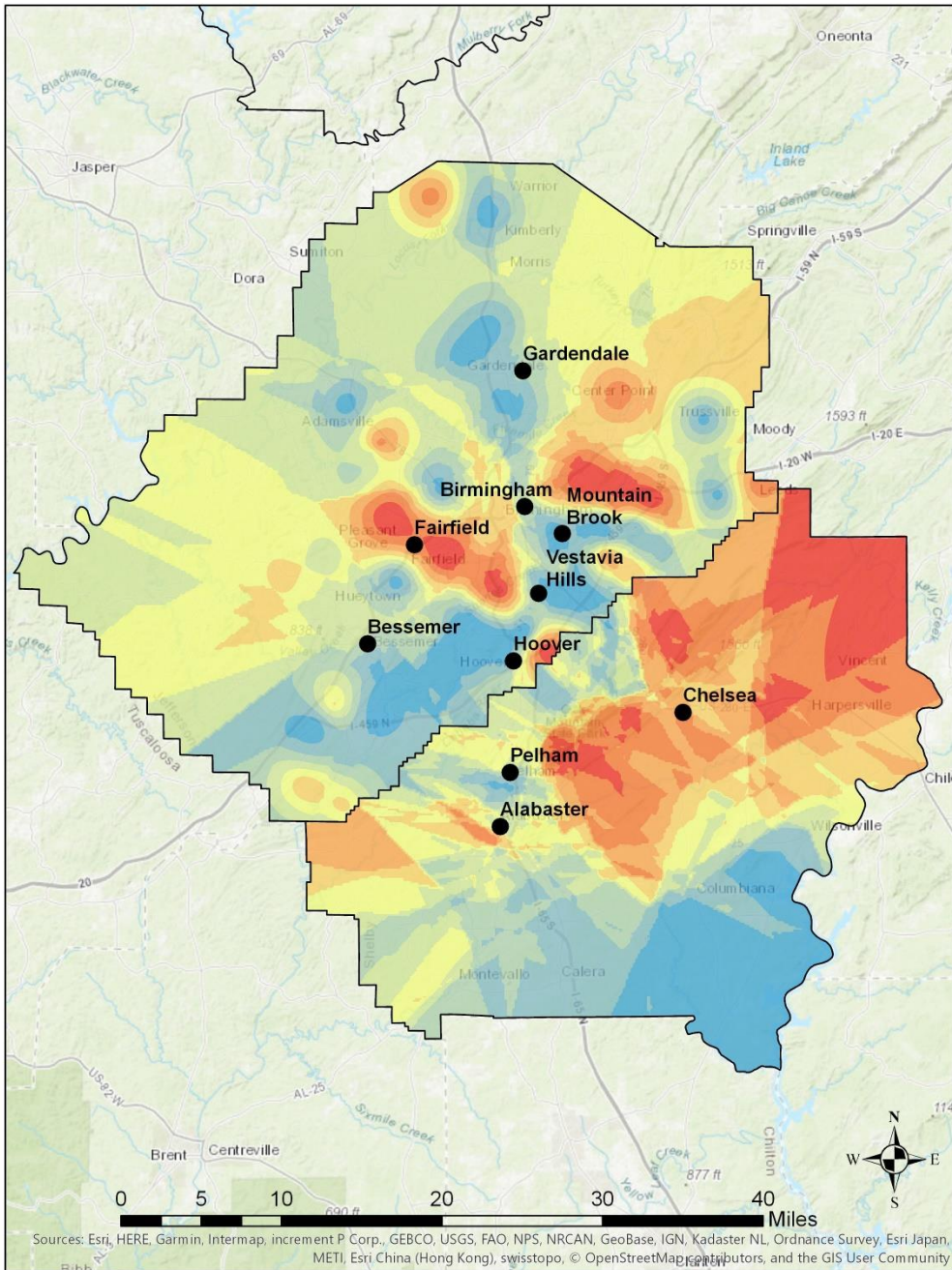
# LIMITATIONS

- Interpolation of social data
  - Not continuous (rainfall, temperature, soil composition)
  - Kriging vs. IDW vs. Spline vs. Natural Neighbor
- “Spatial weighting” of data with regard to activity participation
- Edge/border effect of spatial analysis

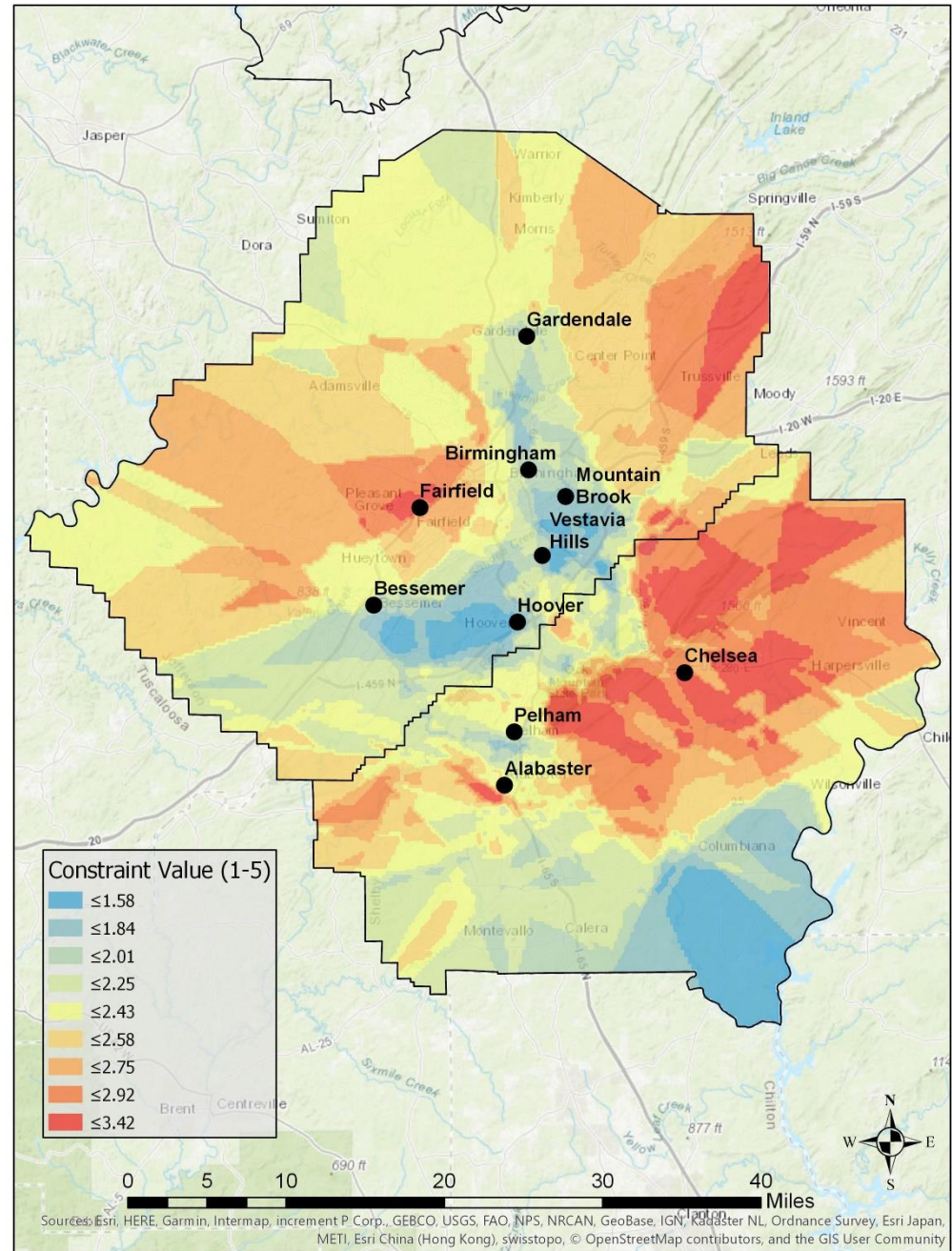




### Constraint to Outdoor Recreation: Not enough nearby facilities

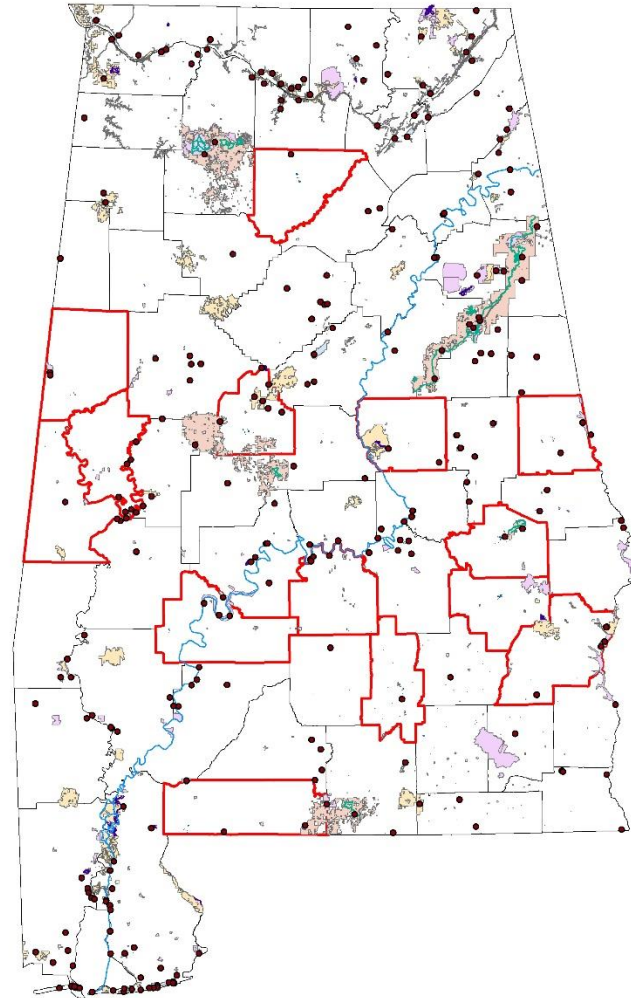


### Constraint to Outdoor Recreation: Not enough nearby facilities



# SUPPLY

- Federal and state lands are fairly easy to identify
- Municipal, private, NGO, and other non-profit lands are more difficult to identify
- Goal is to have a GIS database of all outdoor recreation locations, regardless of the management agency (goal of PAD-US database)





### Bibb County Physical Activity Asset Map



Find A Park Near You

#### Bibb County Rec Parks

<b>Brent City Walking Track</b>	<a href="#">View Park Page</a>
<b>Heritage Park</b>	<a href="#">View Park Page</a>
<b>Stewart Wheeler Park</b>	<a href="#">View Park Page</a>
<b>Centreville Riverwalk Trail</b>	<a href="#">View Park Page</a>
<b>Shayne Williams Park</b>	<a href="#">View Park Page</a>
<b>Bibb Medical Walking Track</b>	<a href="#">View Park Page</a>
<b>West Blocton Coke Ovens Park</b>	<a href="#">View Park Page</a>
<b>West Blocton Town Park</b>	<a href="#">View Park Page</a>
<b>Arvell Kornegay Walking Trail</b>	<a href="#">View Park Page</a>
<b>Woodstock Tiger Trails Cross Country Course and Walking Trails</b>	<a href="#">View Park Page</a>
<b>Bibb County Public Fishing Lake</b>	<a href="#">View Park Page</a>
<b>Pratt's Ferry Reserve</b>	<a href="#">View Park Page</a>
<b>Kathy Stiles Freeland Bibb County Glades Preserve</b>	<a href="#">View Park Page</a>
<b>Brierfield Ironworks Historical State Park</b>	<a href="#">View Park Page</a>
<b>Payne Lake Recreation Area - Talladega National Forest Oakmulgee District</b>	<a href="#">View Park Page</a>
<b>Piper Trail - Cahaba River National Wildlife Refuge</b>	<a href="#">View Park Page</a>

- Bibb County Physical Activity Asset Map

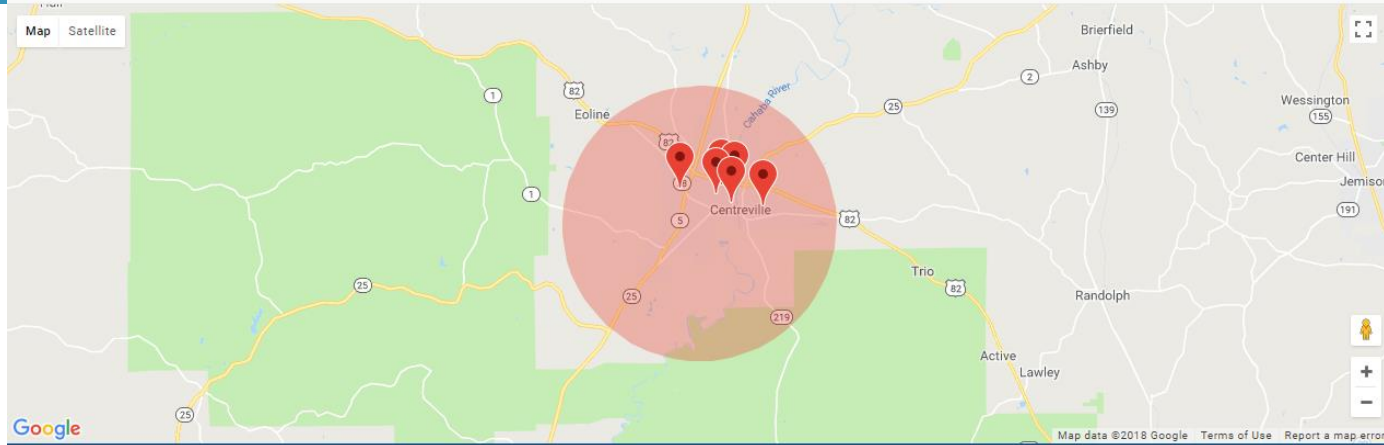
Federal

State

Local

Private or non-profit

## Bibb County Physical Activity Asset Map



Find A Park Near You

Brent, AL

5 miles

Search

### 6 Parks found within 5 miles of BRENT, AL

#### Bibb Medical Walking Track



NO IMAGE  
FOUND

208 Pierson Ave, Centreville, AL

1.24 Miles [Get Directions](#)

[View Park Page](#)

#### Shayne Williams Park



Park Dr., Centreville, AL

1.42 Miles [Get Directions](#)

[View Park Page](#)

#### Brent City Walking Track



1400 University Way, Brent, AL  
35034

1.44 Miles [Get Directions](#)

[View Park Page](#)

#### Stewart Wheeler Park



US Highway 82 and AL Highway  
219, Centreville, AL

1.62 Miles [Get Directions](#)

[View Park Page](#)

#### Heritage Park



Heritage Park Dr. and Patridge Rd.,  
Brent, AL 35034

1.85 Miles [Get Directions](#)

#### Centreville Riverwalk Trail



835 Walnut St., Centreville, AL  
(Next to Bibb County Chamber of  
Commerce)

2.45 Miles [Get Directions](#)

## ■ Bibb County Physical Activity Asset Map

- Bibb County Physical Activity Asset Map

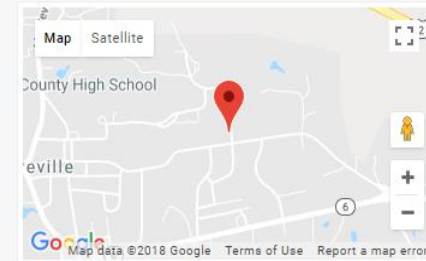
### Centreville Riverwalk Trail



Address: 835 Walnut St., Centreville, AL (Next to Bibb County Chamber of Commerce)

#### Amenities

- Located next to Bibb County High School
- Paved 0.45-mile walking trail along the Cahaba River (out-and-back trail)
- Scenic views of the Cahaba River
- Lighting for walks at dawn and dusk
- Trail is mostly ADA-accessible; however, bumps and slopes in some areas prevent the entirety being accessible by wheelchairs
- Gazebo and rest benches
- Planned renovations by 2020 to include a scenic overlook and canoe launch for access to the Cahaba River
- For more information, call Centreville City Hall at 205-926-4995 or the Bibb County Chamber of Commerce at 205-926-5222



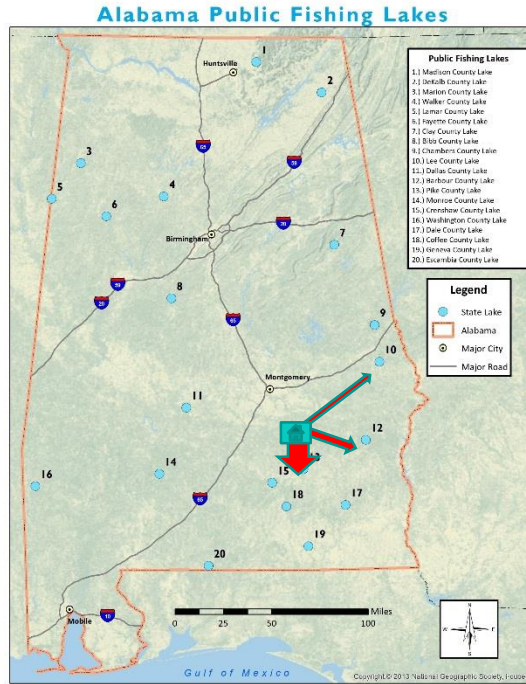


# Distances traveled from respondent home base by activity as an indicator of economic impact and range calculation for setting availability

Wayde Morse, Mitch Carter, Tara Vick, Shelby Burgess, Andrew Kelly, Sibley Barnette (Auburn University)

- Improving demand analysis
- Building demand models
- Predicting visitation patterns using market analysis
- Huff Model

## How far are you willing to go?



## How do you decide where to go on a recreation trip?

- Do you choose an activity first and then decide where to go?
- Do you choose a place to go and then say, "What should we do when we get there?"

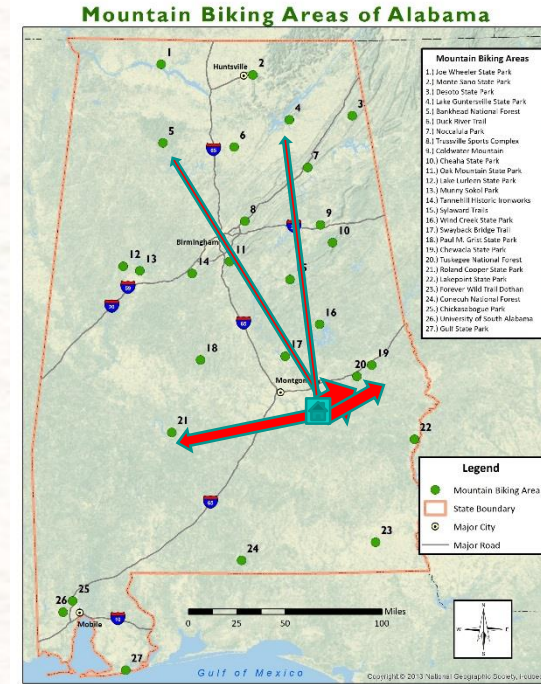
Outdoor recreation opportunities occur as a system and our decisions to visit a site to conduct an activity are dependent on a number of personal motivations and setting factors. Frequently mentioned constraints to outdoor recreation include limited time, access, and cost. However, it is unlikely that these constraints are the same across the landscape as some locations have a plethora opportunities while others do not.

Further, it is oft quoted that 90% (or some various high percentage) of outdoor recreation occurs within 100 miles of someone's home. Little evidence of this is provided in the literature and even less differentiated by recreation activity. As activity opportunity settings are not evenly distributed across the landscape it is likely that the distance that individuals may be willing to travel or how much they may be willing to pay for a certain activity may be regionally specific.

Several research projects led by Auburn MS and undergraduate researchers are assessing the spatial differentiation of constraints, access, and travel costs associated with the system of substitutable sites for different recreation activities.

Each respondent has a home which can be plotted on the map and the number of trips (and how much they paid) can be linked to the specific locations. Example survey responses are given for one individual in red on each map. Larger arrows represent more trips.

## What are you willing to pay for it?



## Spatial Analysis of Opportunity Settings by Activity

- Spatial analysis can aid in the process of predicting visitation patterns through applying established concepts like consumer and market retail analysis. For retail analysis, a model is developed to predict the probability that a consumer from a particular location will patronize a given store. This prediction is typically based on two attributes, the distance from the consumer to the store and the store's attractiveness, often measured in size.
- Applying the same concepts with outdoor recreation resource management in mind, predictions can be made to assess the probability that residents in any given location will patronize a particular protected area. This model—known as the Huff Model—has been optimized for a variety of interests, including multi-attribute outdoor recreation settings.
- Opportunity setting amenities can be ranked and weighted based on their importance to the attractiveness of a park to determine pull to that park. Alternatively, the number of visits to an area by spatially located individuals can provide their revealed preferences regarding the importance of setting amenities and the distance they are willing to travel.
- Finally, this data will provide evidence of regional draw (what percent come from how far to any specific location) and how far any individual is willing to travel (what percent of their activity is within what distance from their home – by activity – and by region).

## Economic Analysis of Opportunity Settings by Activity

- Individuals are asked to report the travel costs for their most recent recreation trip, their most frequent recreation trip, and/or their furthest recreation trip. Costs are requested in detail and can be disaggregated to explore differences by activity, location, and distance.
- Estimations of the economic impact of recreation to each setting can be examined by combining the travel costs with local visitation records.
- Costs can be compared to explore variations in activity cost by region and compared across activities.
- Cost data can be integrated with the distance traveled data to understand regional differences in activity expenditures and opportunity access constraints.
- Finally, this data will provide evidence of regional economic constraints and how much any individual is willing to pay (what percent of their trip activity is within what budget – by activity – and by region).

# ACKNOWLEDGEMENTS

- ALProHealth State Team:
  - Barb Struempler, Co-PI, Fiscal
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  - Onikia Brown, Co-PI, Nutrition, School of Nursing
  - Jennifer Wells-Marshall, Co-PI, Evaluation
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  - Mitch Carter, Environmental Assessor
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  - Cooperative agreement IU58DP005466-02

