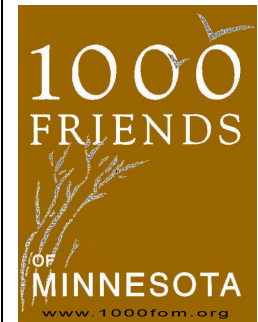


Goodhue County Environmental Constraints Land Use Evaluation (ECLUE) Model

1000 Friends of Minnesota
Alison Slaats



Project Partnership

- Goodhue County
- MN DNR
- 1000 Friends of Minnesota



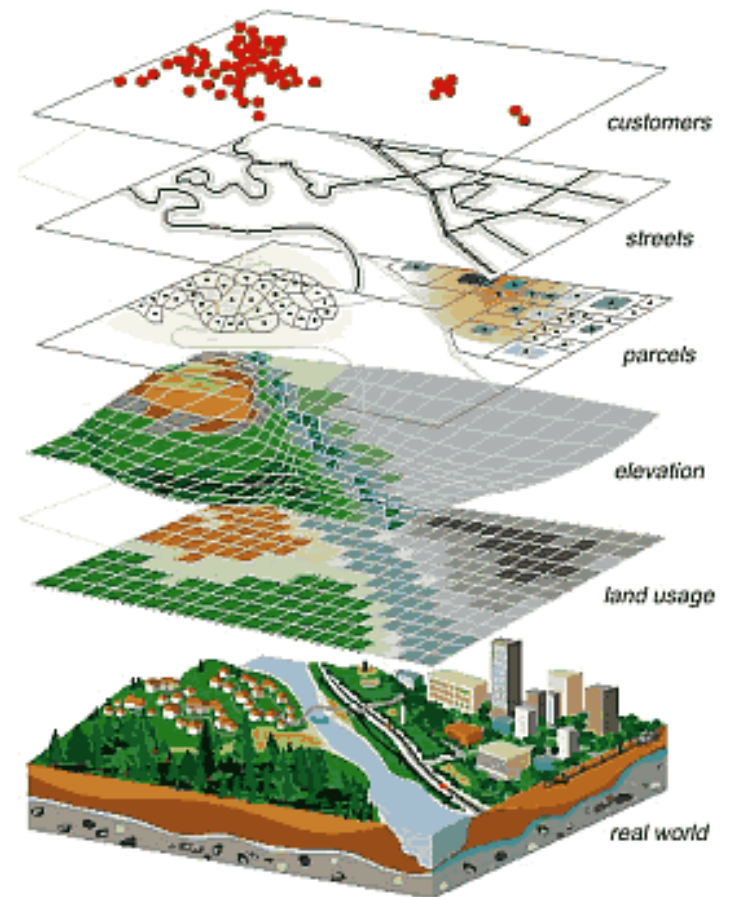
Context for model

Goodhue County

- Experiencing growth
- Has environmentally sensitive and aesthetically beautiful landscape
- Decisions need to be made on development and land use
- Strong GIS department & good GIS data

What is a land use model?

Uses available data to create a computer-generated “model” of existing conditions to create an overall picture of land use characteristics in Goodhue County



Why use a model?

- Reviewing many GIS layers can be overwhelming
- A model can provide value by combining those layers in a meaningful way
- The true value of a land suitability model is that it inputs *data* and it outputs usable *information*

Overall goal of ECLUE model

- To help support decision makers by providing *easier* access to environmental and other characteristics of Goodhue County

Model development process

- Process
 - Reviewed existing land use models
 - Sought input from experts
 - Held meetings with decision makers and the public
- Items discussed
 - Type of model raster vs. vector
 - Datasets to use
 - How to quantify data (using attributes)

Model Description

- Submodels
 - 3 submodels that group data
 - Results of each submodel can be viewed individually
 - Final output combines 3 submodels
- Data
 - Most data layers are scored 0 or 1
 - Some data layers have range of scores 1-3 biggest range
 - Layers are simply “added” together
 - Vector data format selected
- Tools
 - ArcMap ModelBuilder - flexible, scalable
 - ArcMap used by Goodhue Co. GIS

Submodels and data layers

| Natural Resources | Regulatory | Additional Considerations |
|---|--|--|
| <ol style="list-style-type: none"> 1. <i>High Quality Ecological Areas</i> 2. Riparian Habitat 3. <i>Bluff Land</i> 4. Rivers and lakes 5. Streams 6. Wetlands 7. Sinkholes 8. <i>Sensitivity to Groundwater Pollution</i> 9. Geologic Edges | <ol style="list-style-type: none"> 1. Steep Slope & Hydric Soils 2. Cannon River Wild & Scenic Area 3. Shoreland Areas (around protected water features) 4. Floodplain Areas 5. Areas Around Bluff Land 6. Registered Feedlots | <ol style="list-style-type: none"> 1. Aggregate Resources 2. Registered Mining Locations 3. Prime Agricultural Soils 4. Potential Green Corridors 5. Wind Power Potential 6. Publically-owned Land |

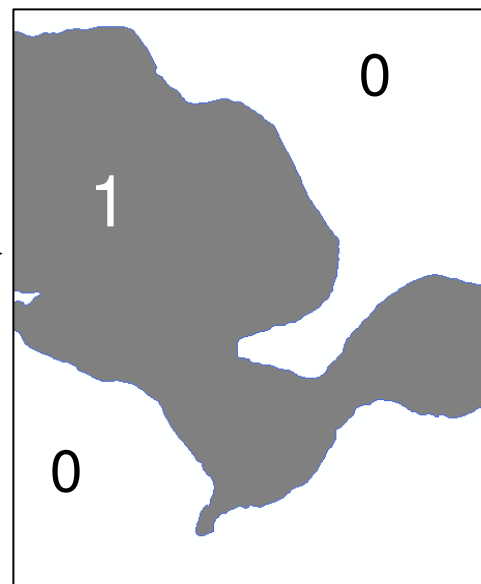
How the model works

- Each data layer is included in model
- Each polygon is assigned a value depending on whether or not a characteristic is present

Wetlands

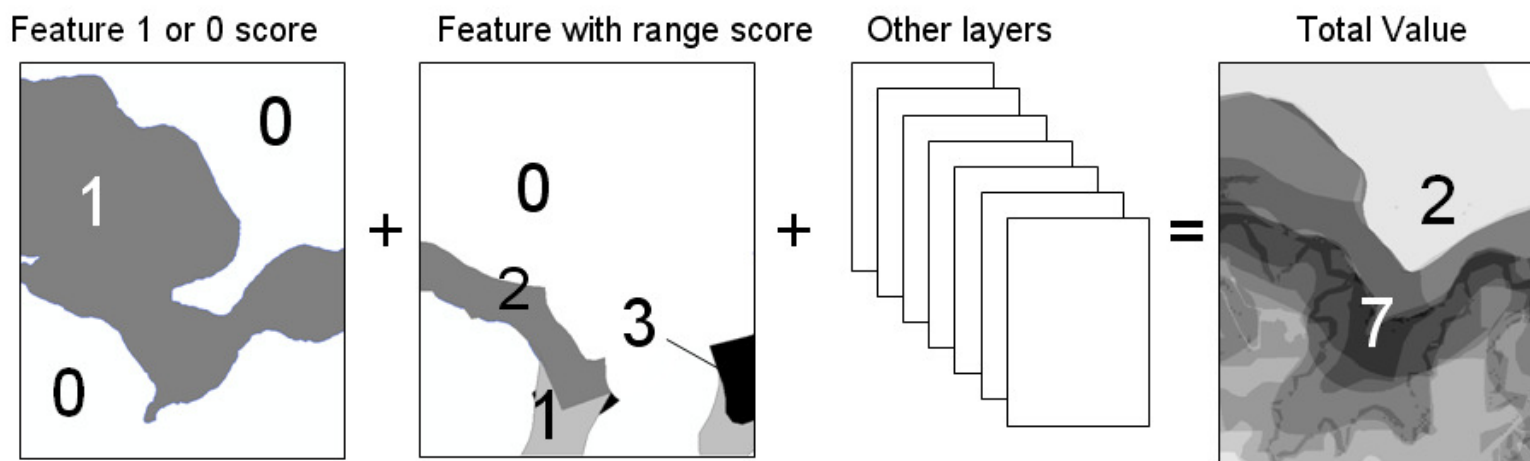


Scored data



How the model works

- Layer Values
 - Some layers have binary values: 0 or 1
 - Other layer have a range of values: 1-3
 - Values are “added” together to create total value



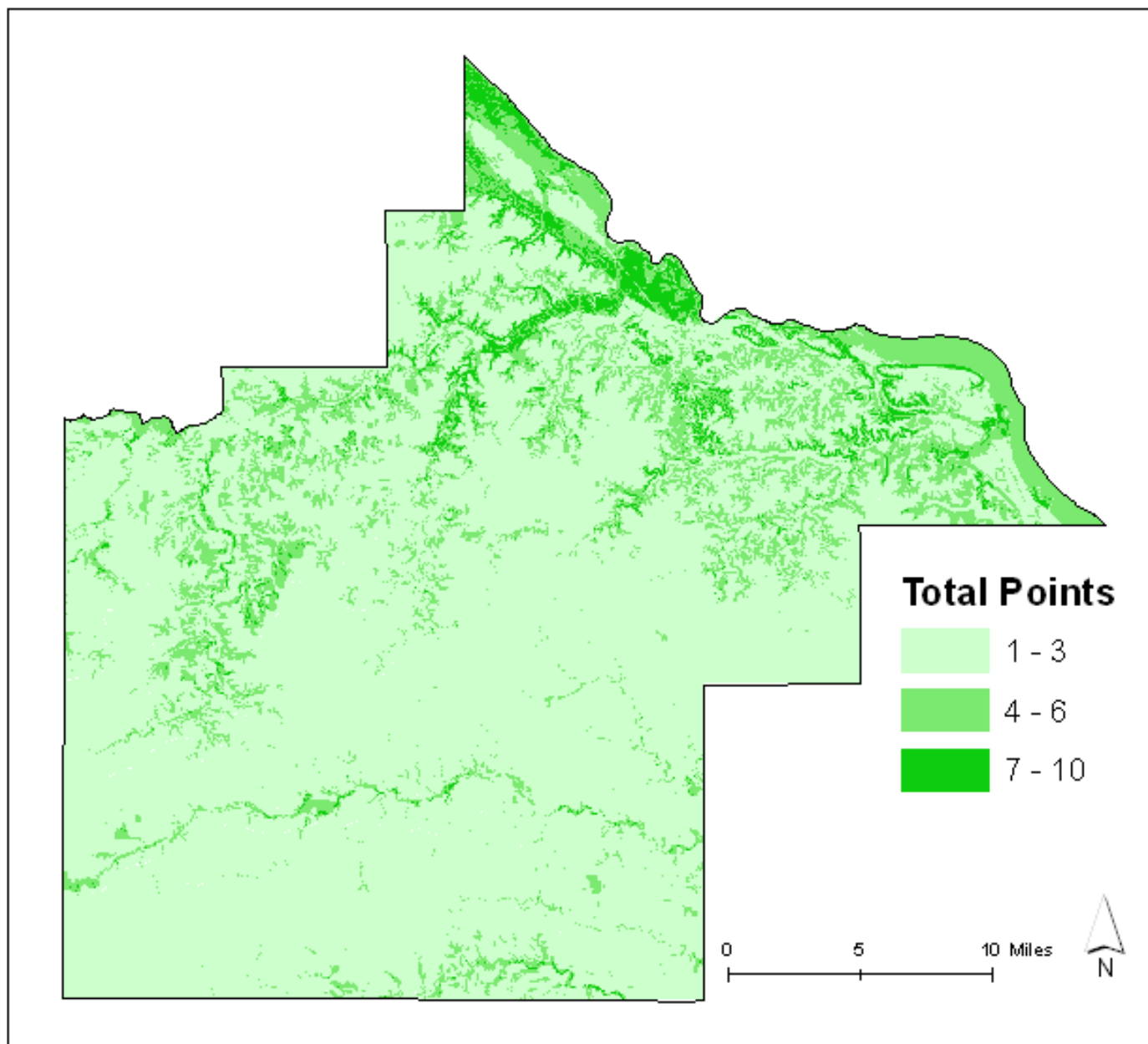
Model Results

- Results dataset for each submodel
- Each input data layer has attribute column in results shapefile
- Each polygon's score can be viewed

Submodels and data layers

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Natural Resources Submodel Results

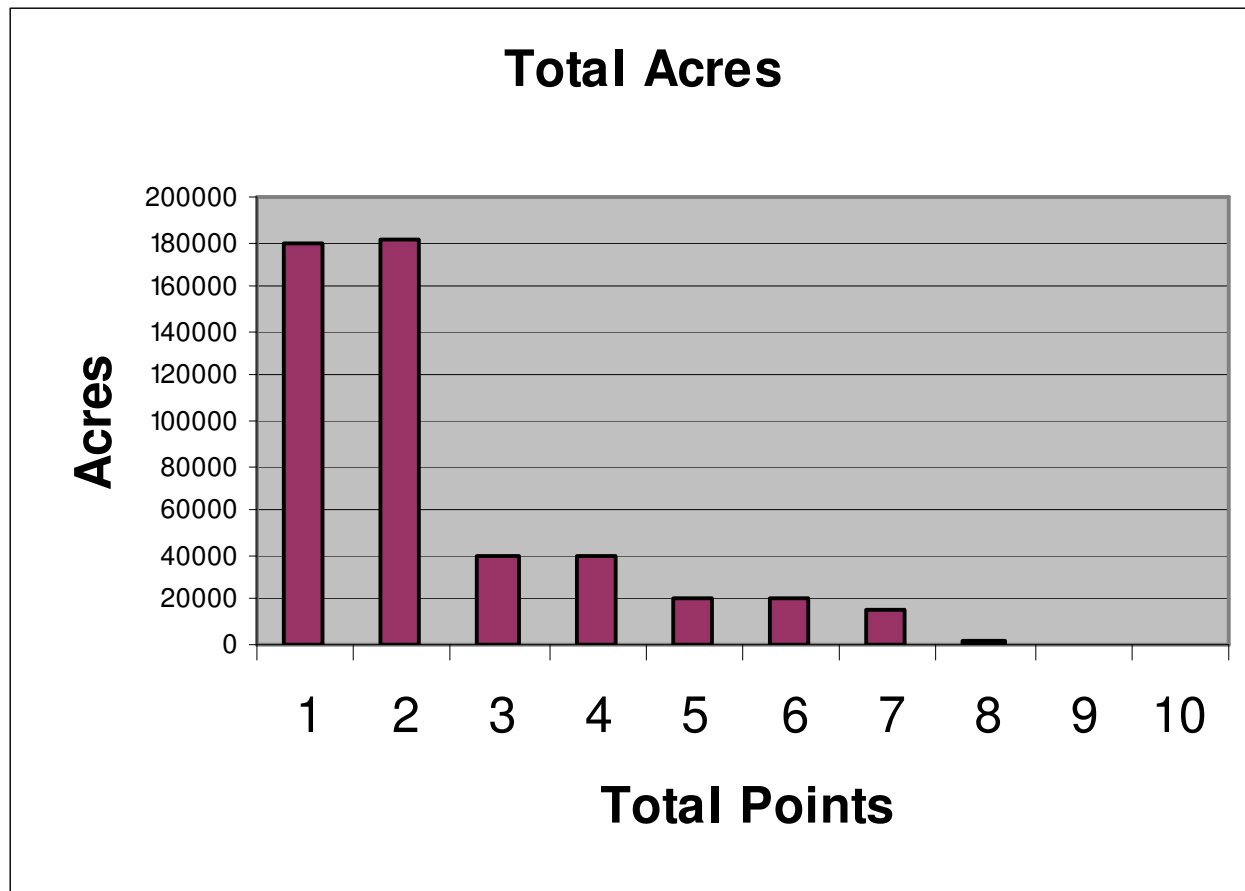


Natural Resources Results

- Possible point range 0-13
- Actual range result 1-10
- Goodhue County is 499,082 acres (780 sq. mi.)

| <i>Natural Resource Points by Acreage</i> | | |
|--|--------------------|----------------------------|
| Natural Resource Points | Total Acres | % of Goodhue County |
| 1 | 179500 | 35.97% |
| 2 | 181092 | 36.29% |
| 3 | 39595 | 7.93% |
| 4 | 39394 | 7.89% |
| 5 | 21350 | 4.28% |
| 6 | 20552 | 4.12% |
| 7 | 16229 | 3.25% |
| 8 | 1777 | 0.36% |
| 9 | 71 | 0.01% |
| 10 | 0 | 0.00% |

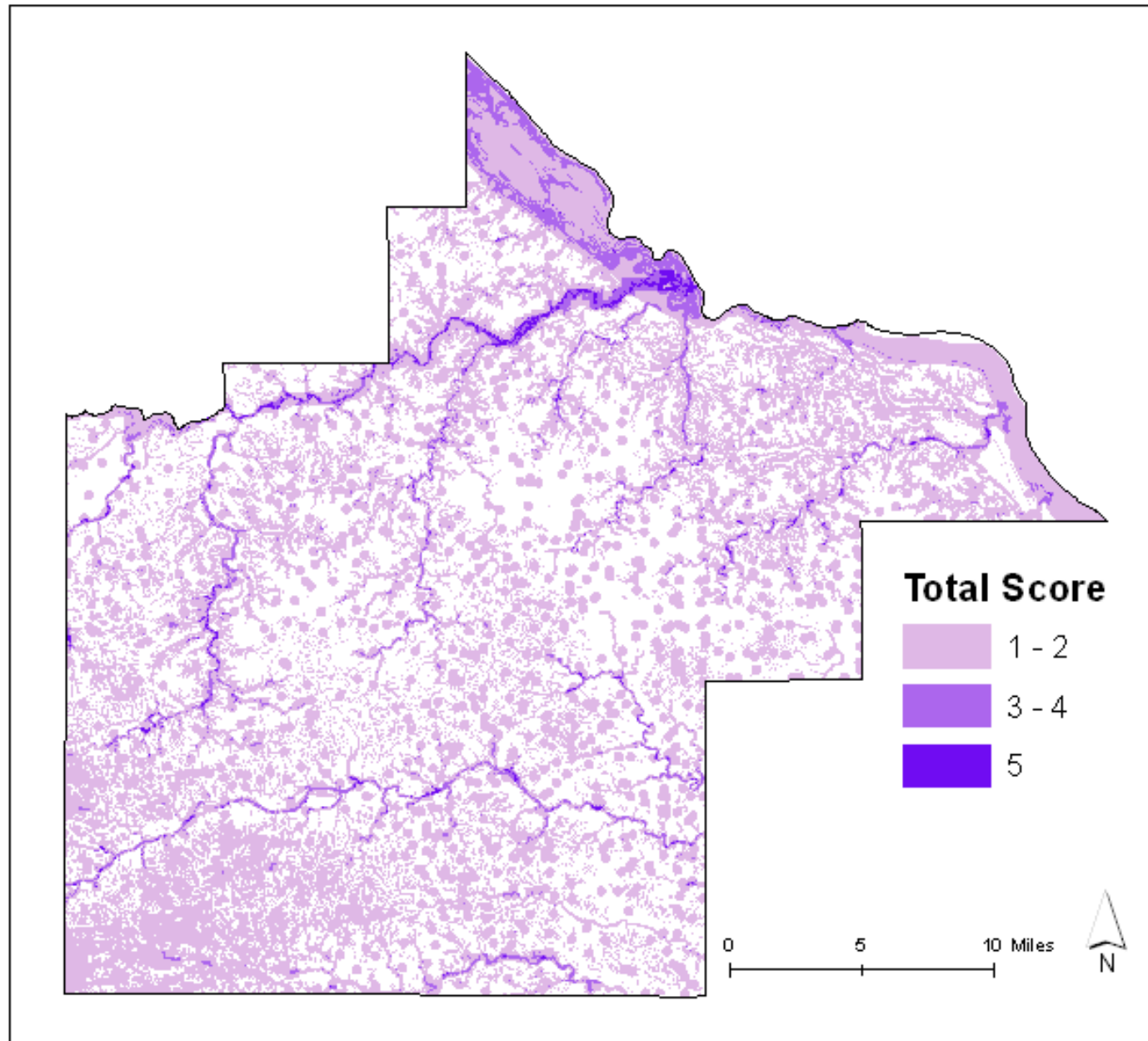
Frequency – natural resources



Submodels and data layers

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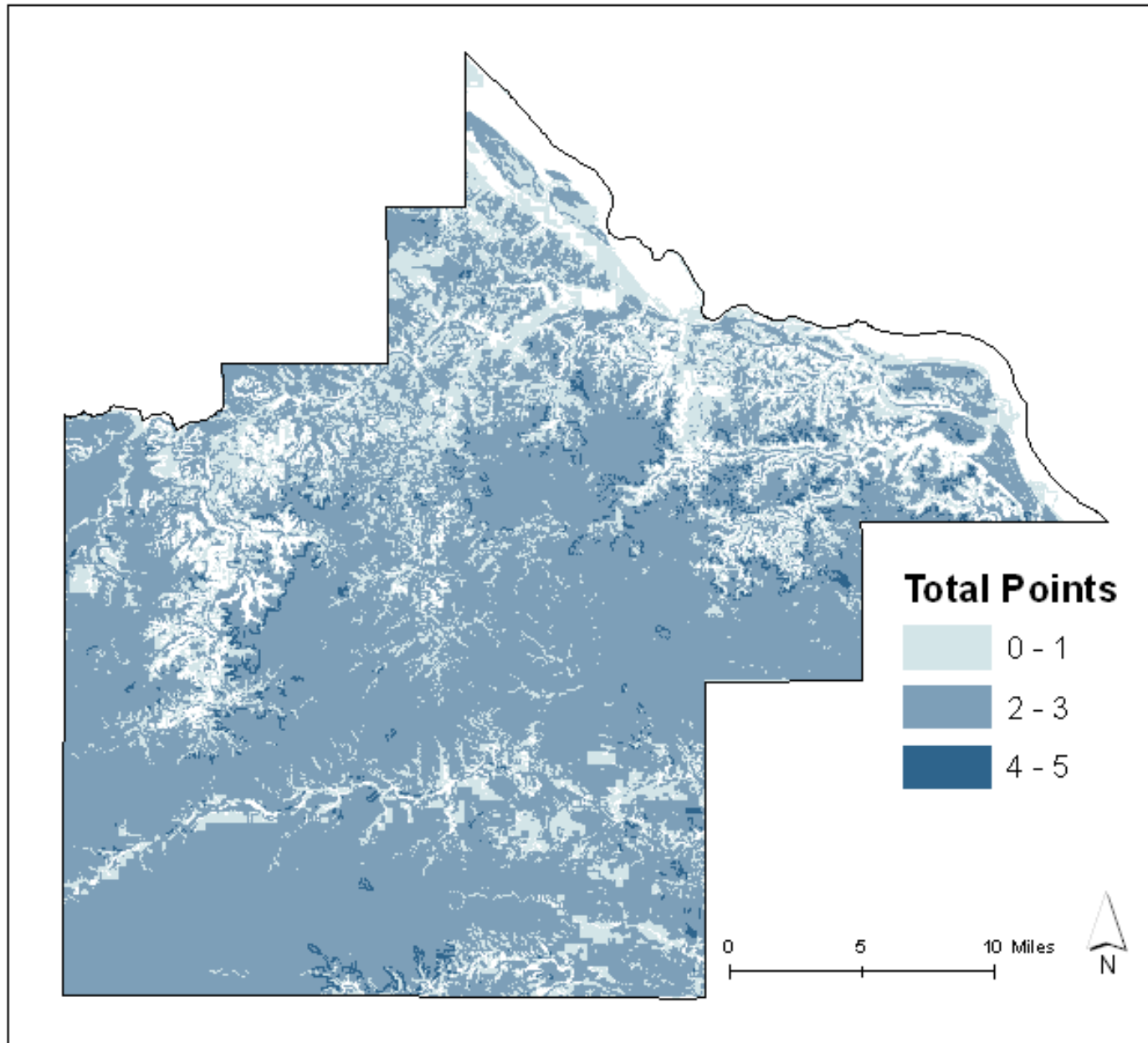
Regulatory Submodel Results



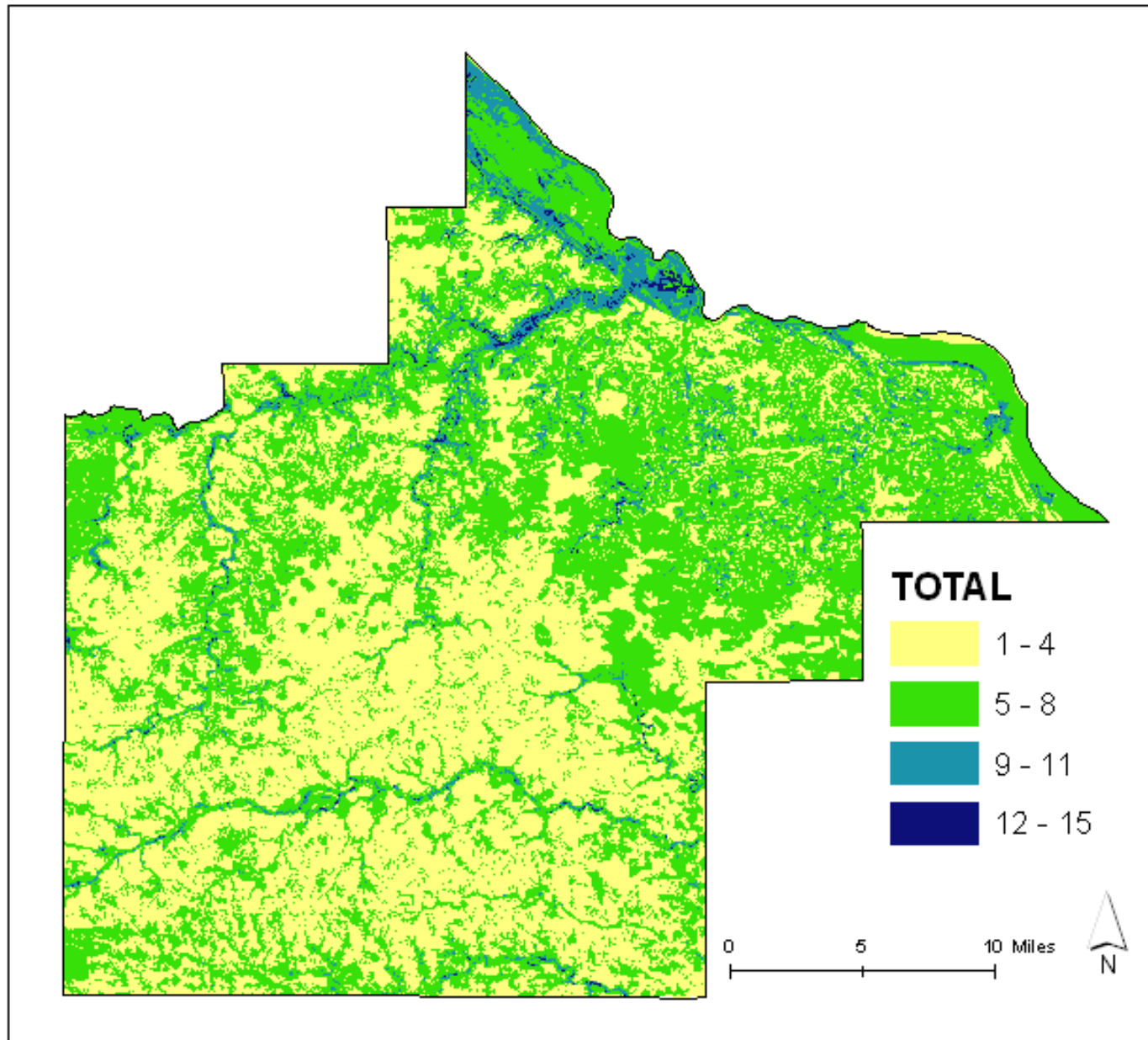
Submodels and data layers

| Natural Resources | Regulatory | Additional Considerations |
|---|--|--|
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Additional Considerations Submodel Results



Full Model Results

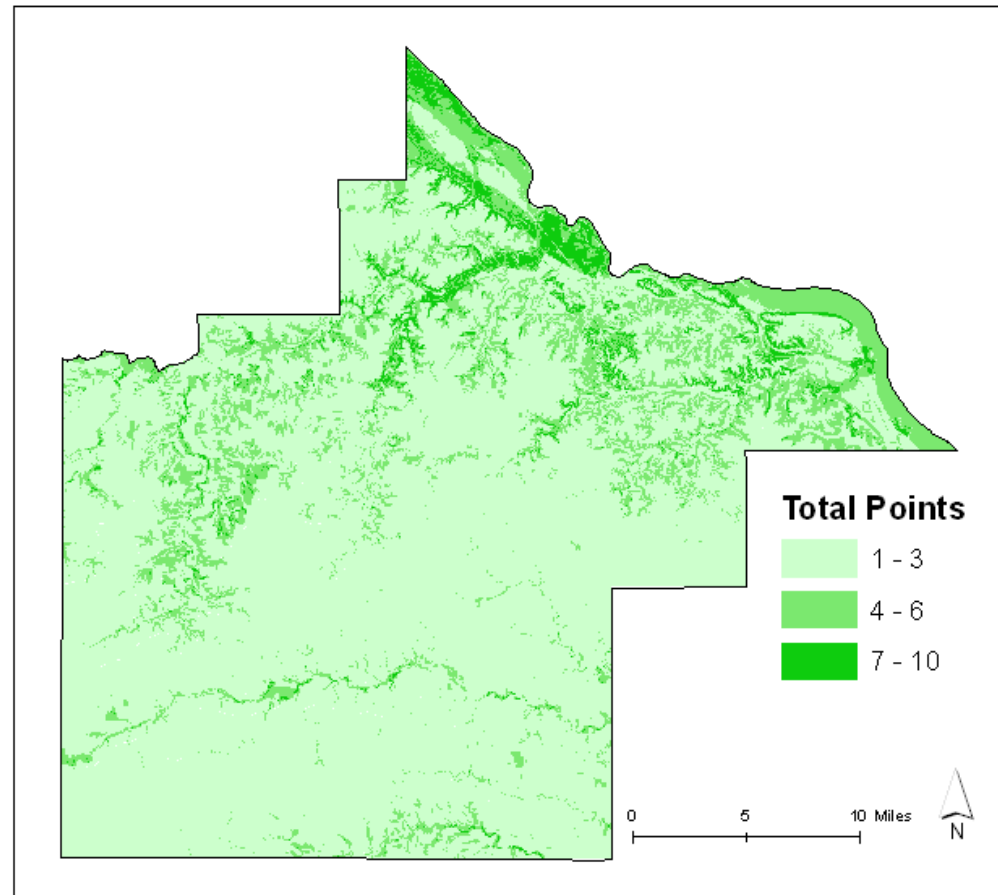


How can the model be used?

County-wide planning

- More sensitive areas could be examined for long range planning.

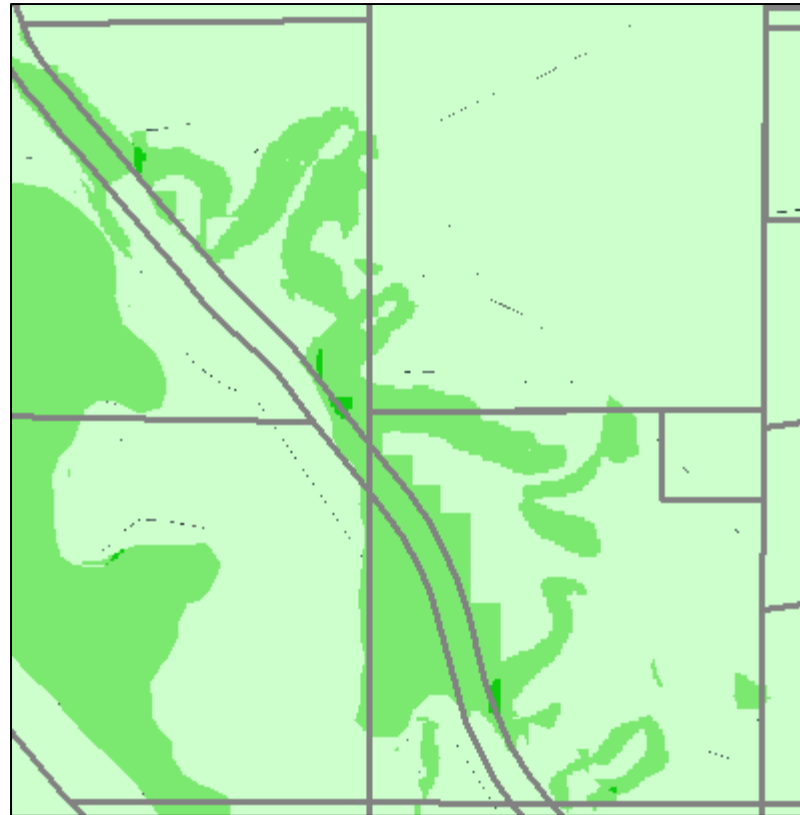
Natural Resources Submodel Results



How can the model be used?

Local level

- More and less sensitive areas within a parcel are indicated by model results.



Demo

- Layers
- Results
- Identify
- Steep slopes – problems



Thank you!



Questions/Discussion?

Contact

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