

Example: Site Analysis

Identify suitable areas for wind farms in USA

Criteria require areas with:

1. High average wind speed
2. Low population density



Step 1

Frame the problem/question: Where are locations of low population density and high average winds located in the US Lower 48 states?

- Identifying these sites will provide information for further research internally.
- Deliverable will be a google map and graphic for further discussion.

Step 2

Develop a plan: Only looking for a general idea of regions that meet criteria and to demonstrate the power of spatial overlay.

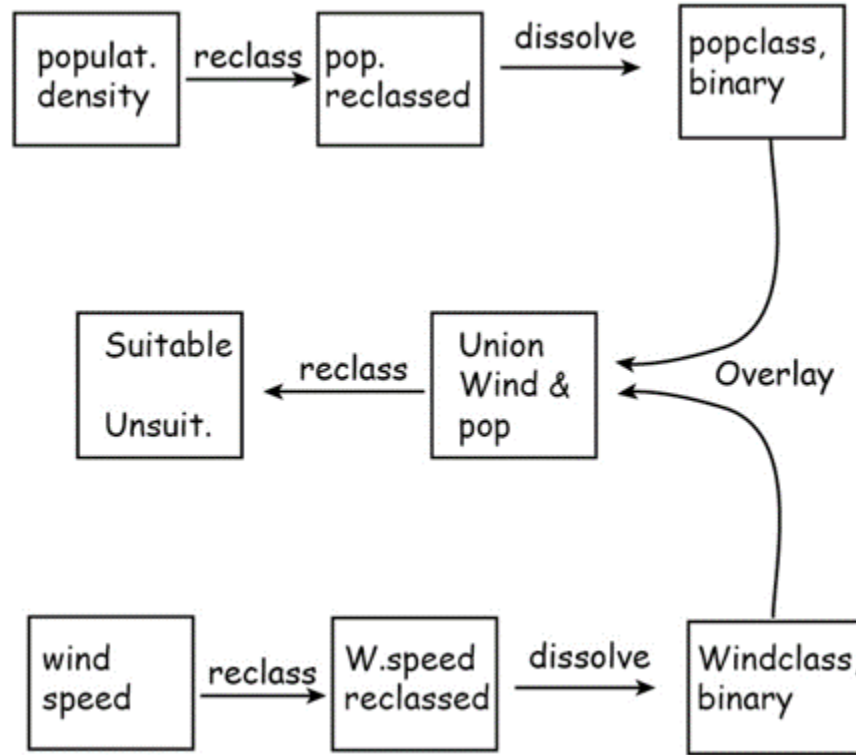
- Identify Data Sources: Use free and available data
- Outline Spatial Analysis Steps
- Identify deliverables: Map of suitable sites
- Estimate time and costs: Quick and Free!

Spatial Analysis Methods

- Select Datasets: High wind, few people
- Reclass Wind Speed
 - ◆ Dissolve to suitable/unsuitable regions
- Reclass Population
 - ◆ Dissolve to suitable/unsuitable regions
- Intersect population & windspeed reclassifications
 - ◆ Reclass, Dissolve Results

Source: GIS Fundamentals by Bolstad, 2015.

Spatial Analysis Steps



Source: GIS Fundamentals by Bolstad, 2015.

Step 3

Obtain Data: High wind, few people

- Wind Data: Download from US Dept of Energy [website](#)
- Population Data: Download data from US Census **or** simply use data from Lab 2: Cancer Mortality data (easier)

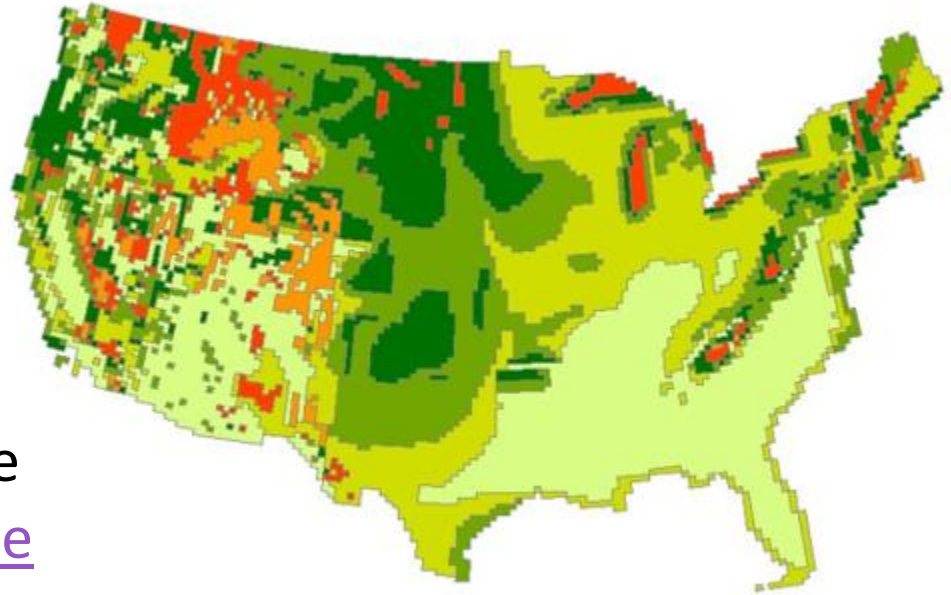
Step 4. Explore Wind Data

Wind rating

Low (light green)

High (red/orange)

Data Source: National Renewable
Energy Laboratory (NREL) [website](#)



Source: GIS Fundamentals by Bolstad, 2015.

Step 4. Explore Population

Population Density: People per square mile (ppl/sqmi)

Sparse: ≤ 10 ppl/sqmi

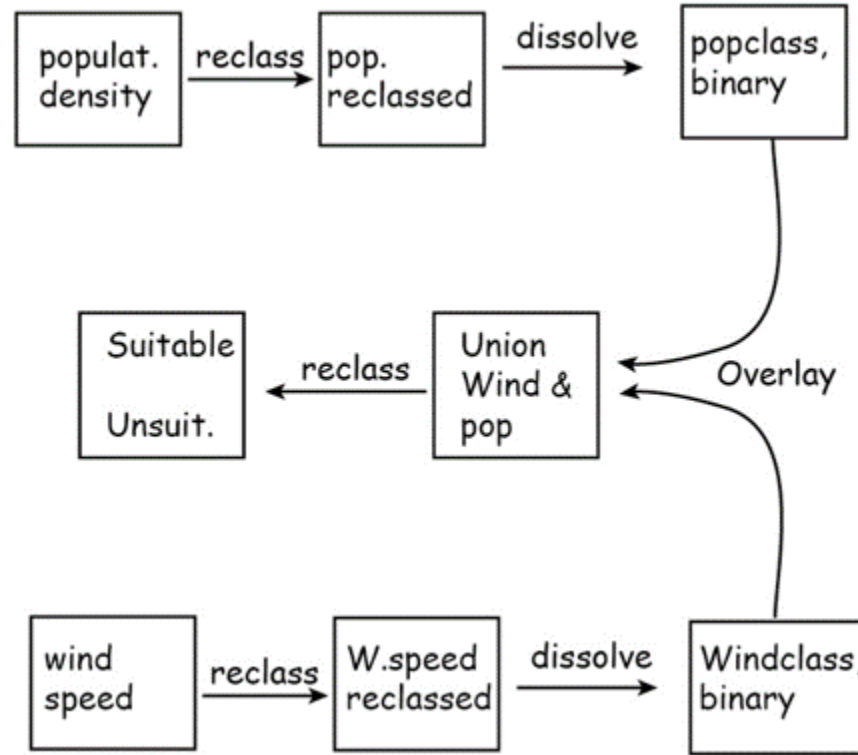
Dense: > 10 ppl/sqmi

Data Source: US Census Bureau



Source: GIS Fundamentals by Bolstad, 2015.

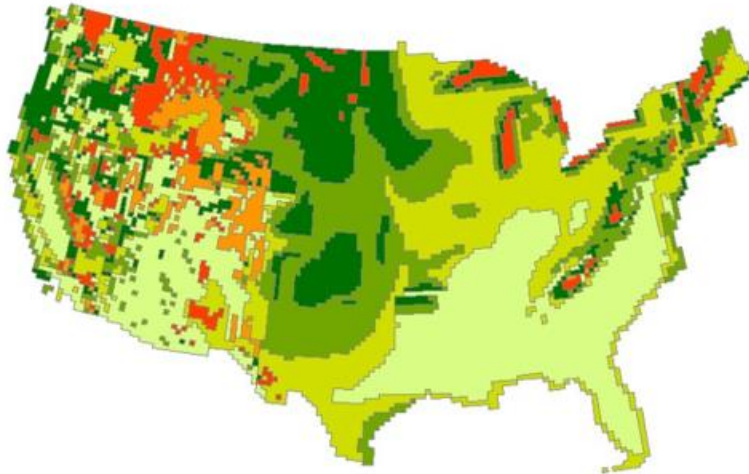
Step 5: Methods



Source: GIS Fundamentals by Bolstad, 2015.

Reclass Wind Speed

Wind Speed Rating → High speed (red)
Low speed (green)



Source: GIS Fundamentals by Bolstad, 2015.

Reclass: Population

Population Density → Sparse (green)
Dense (red)



Source: GIS Fundamentals by Bolstad, 2015.

Overlay Operation

High Winds (red)



Sparse Population (green)



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Source: GIS Fundamentals by Bolstad, 2015.

Suitable Sites (yellow)



Source: GIS Fundamentals by Bolstad, 2015.