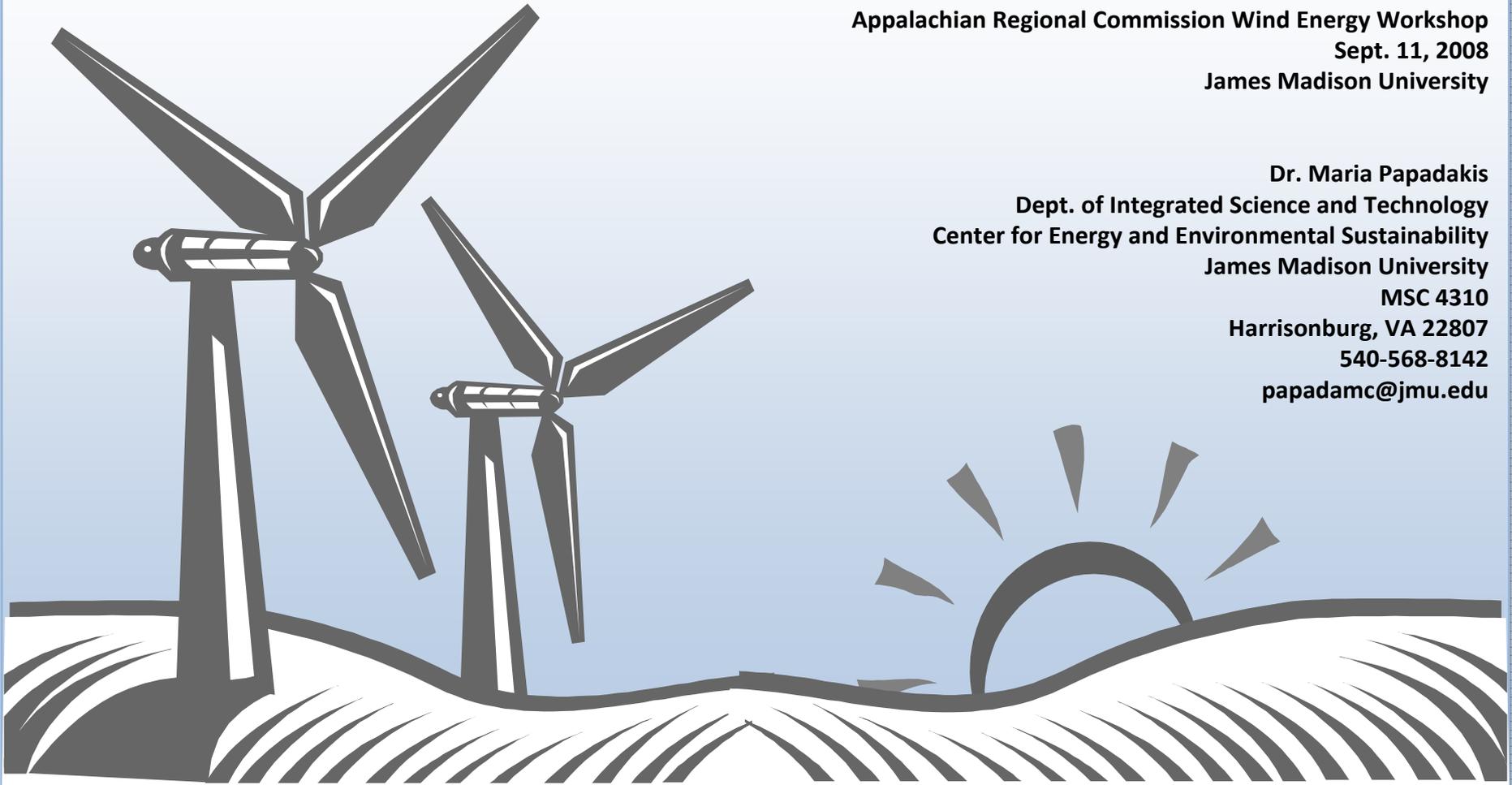


# The Virginia Renewables Siting Scoring System

Appalachian Regional Commission Wind Energy Workshop  
Sept. 11, 2008  
James Madison University

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# Today's Agenda

- Introductions
- Overview of the VRS3
- Step 1: Know Your Wind Resources
- Step 2: Prescreening Your Community
- Step 3: Scoring Tracts in Your Community
- Step 4: How to Use the Scores
- Q&A

# What is the VRS<sup>3</sup> ?

- A proactive wind resource evaluation and siting analysis tool
- “suitability model,” “screening tool,” “preliminary siting tool”
- Integrates criteria used by land use planners, developers, and communities
- It is **\*NOT\***--
  - A micro siting process
  - An environmental impact assessment
  - A project assessment or project impact tool

# What is the VRS<sup>3</sup> ?

- It answers the basic question—  
*“Which places are more (or less) suitable than others for siting wind energy systems, and why?”*
- It is designed primarily for land use planners
- Others can use it, but not quite as easily
- Requires GIS, local maps, and local knowledge
- Works best at the county scale

# What is the VRS<sup>3</sup> ?

- A numerical scoring system mandated by the state legislature (see handout)
- Real parcels of land
- Must account for:
  - wind characteristics
  - proximity to power lines
  - Potential impacts on natural & historic resources
  - Compatibility with local land use plan
  - Potential impacts on minority and disadvantaged communities
- Must allow standardized comparisons between scores
- Must have a benchmark “ideal” score

# What is the VRS<sup>3</sup> ?

It scores 15 individual criteria in 3 categories

## Land Use Planning

1. Compatibility w/ Comp Plan\*
2. Consistency w/ Zoning \*
3. Parcel fragmentation
4. Degree of multiparty consultation

## Natural Resources

5. Fish & wildlife implications\*
6. Cold water streams\*
7. Plant, insect, & natural heritage resources implications\*
8. Forest implications\*
9. Watershed implications\*
10. Special scenic vistas

## Community Development

11. Presence of economically disadvantaged communities\*
12. Environmental justice issues\*
13. Preferential land uses
14. Cultural assets\*
15. Recreational value

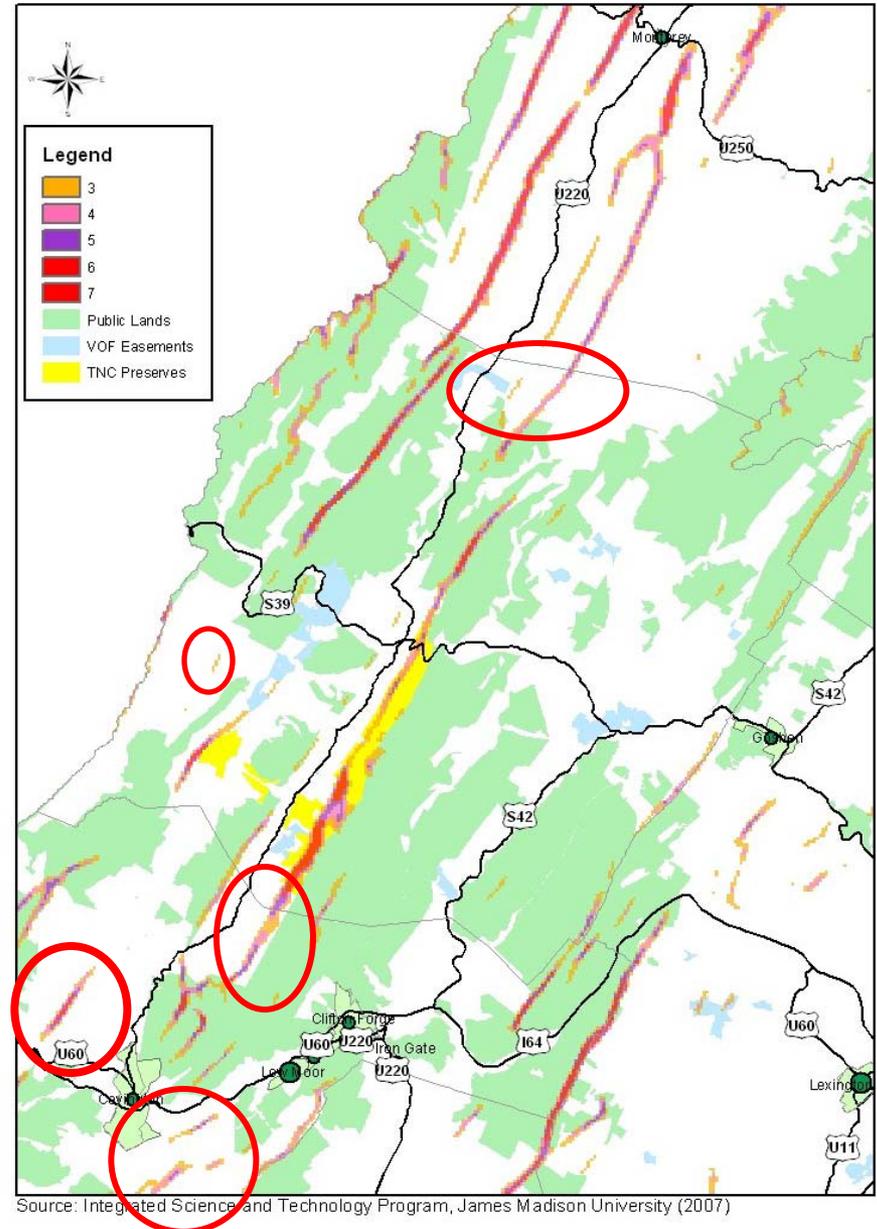
- Each item scored 0-2
- Total score = 30
- \* = Criteria required by legislation

# Why Use the VRS<sup>3</sup> ?

- Social, economic, political pressures for wind energy are increasing
- Breadth of criteria
  1. Land Use Planners...
    - Incorporate in comprehensive planning process
    - Evaluate potential for community wind energy
    - Empower discussions with developers
    - Identify possibility of utility scale wind
  2. Developers...
    - More holistic, addresses many community concerns up front
  3. Citizens...
    - Understand wind issues in your community, suitability of own property
  4. Non-Profit Groups

Here, for example,  
are five tracts that  
Bath County might  
like to evaluate and  
compare

### Wind Resources in Bath County, VA



# Limitations of the VRS<sup>3</sup>

- Someone will always be (very) unhappy
- It is for guidance, not actual siting
- There are other major considerations not currently accounted for in the scoring system (e.g., FAA regulations)
- It can be used “reactively,” but it means the process will be rushed
- The viewshed issue
- But...
  - It is very transparent, with explicit criteria



# Purpose of Step 1: What's Your Wind?

***In Step 1, you will learn more about wind energy and the size of wind energy systems. You will also determine whether or not your community has sufficient wind resources to power more than small, onsite systems.***



A 1-kW onsite system in Floyd, VA



A 660-kW community system in Hull, MA, less than 10 miles from Boston.



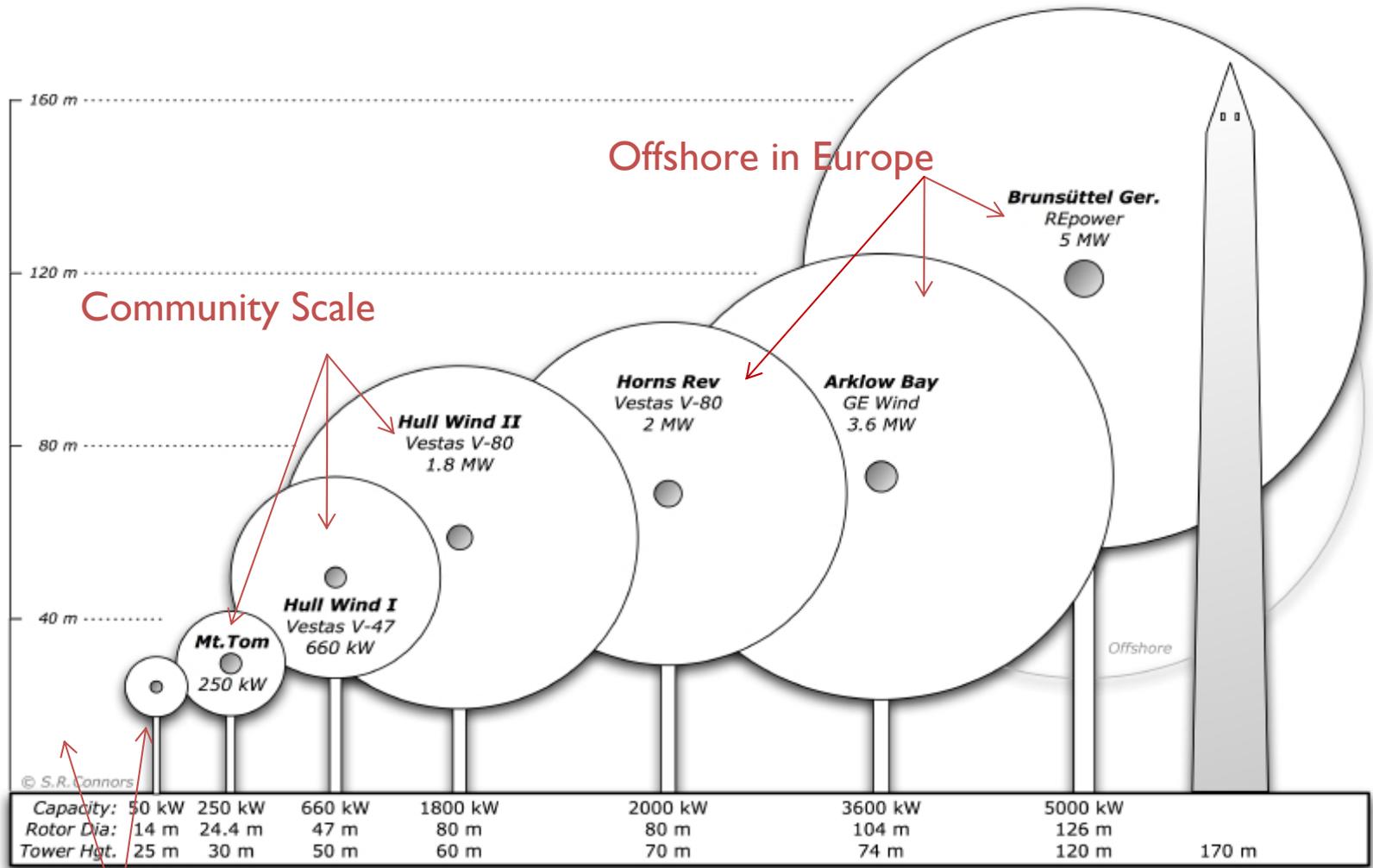
Four (of 44) 1.5 MW turbines at Mountaineer in West Virginia.

# Putting It All Together

- Basic prerequisites for community and commercial wind energy development in the mid-Atlantic: (see handout for more detail)
  - Availability of a wind resource, and its class
  - Topography
  - Accessibility of, distance to, electric power lines
  - Price/cost of electricity

Wind Class	Potential for Wind Development
Class 1 or 2	<ul style="list-style-type: none"><li>• Marginal for onsite</li><li>• Unsuitable to marginal for community-scale</li><li>• Unsuitable for utility-scale</li></ul>
Class 3	<ul style="list-style-type: none"><li>• Appropriate for onsite</li><li>• Marginal to appropriate for community-scale</li><li>• Unsuitable for utility-scale</li></ul>
Class 4	<ul style="list-style-type: none"><li>• Appropriate for onsite or community-scale</li><li>• Marginal for utility-scale</li></ul>
Class 5+	<ul style="list-style-type: none"><li>• Appropriate for all scales</li></ul>

# Putting It All Together



Onsite

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# Putting It All Together

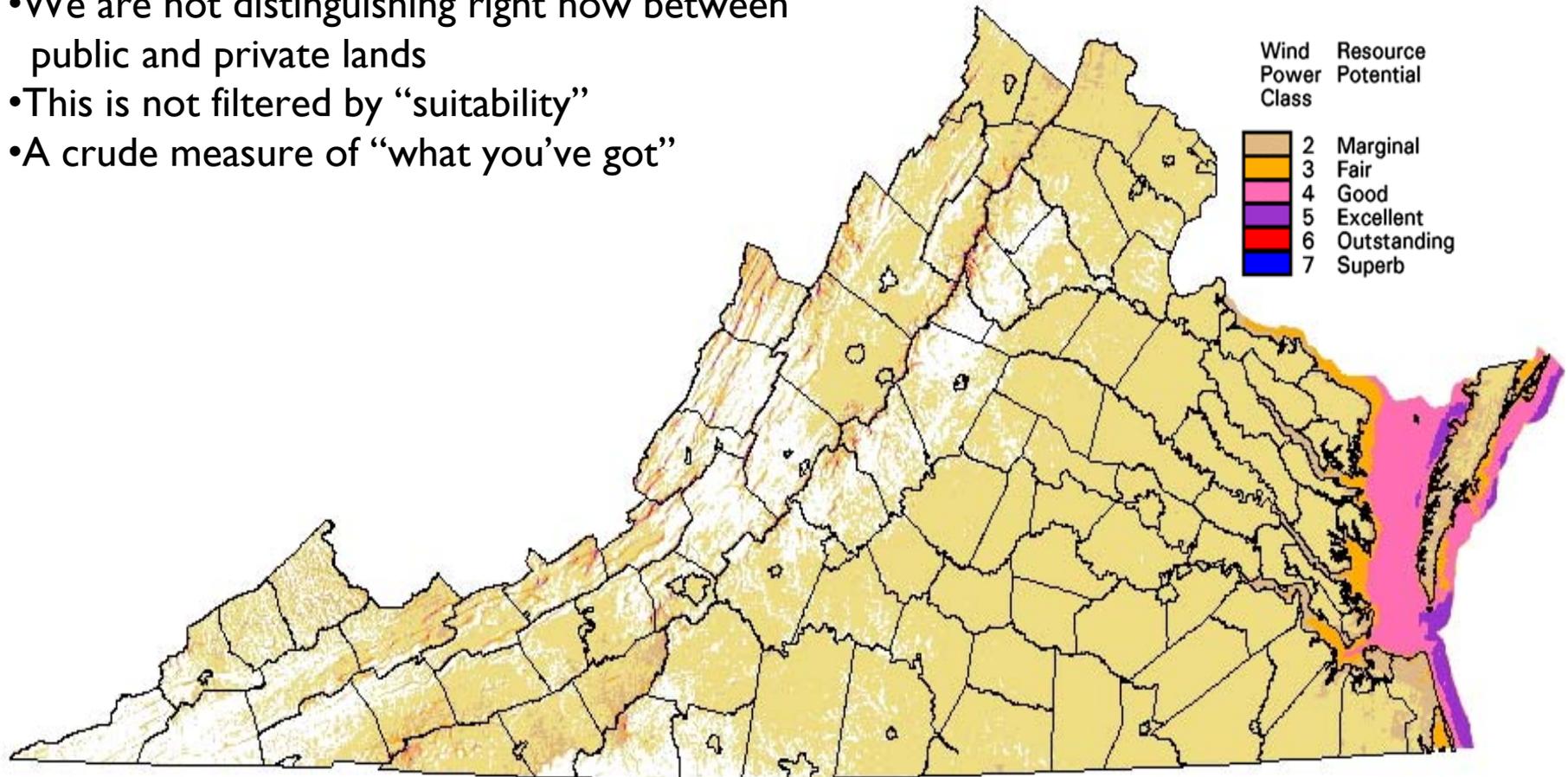
- Land requirements vary from 1/2 to 4 acres per turbine for onsite and community
- For utility, varies from 2 acres (if in series) to 25 acres (if arrayed 2-dimensionally)
- A linear mile of ridgeline holds 6-12 turbines depending on size of the turbine

# Advantages & Disadvantages of Wind Power

- Cost effective at right wind class, scale
- Installs relatively quickly
- Emits no air pollutants
- Can offset price volatility of electricity and fuels
- Reliable
- But...
  - Intermittent
  - Supplements, does not replace, fossil fuels
  - Site impacts matter: social, cultural, and environmental sensitivities
  - Very location-specific

# What's Your Wind?

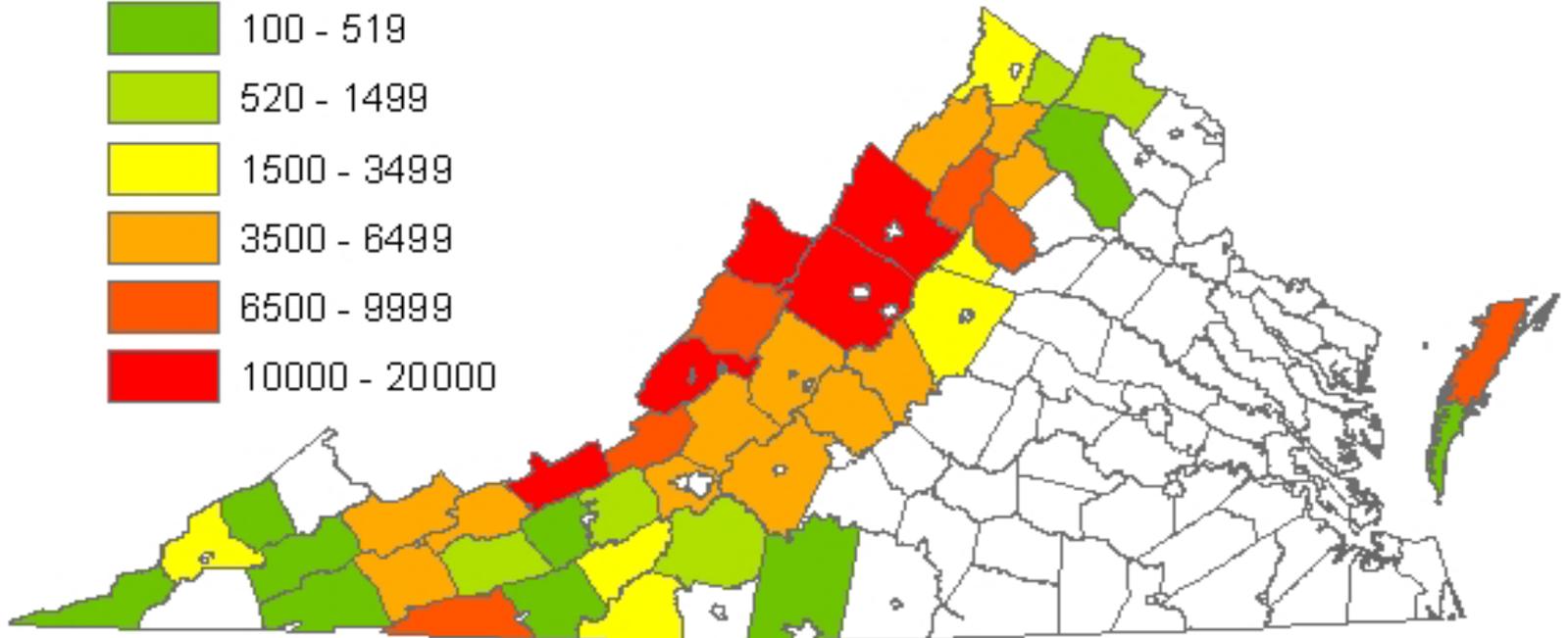
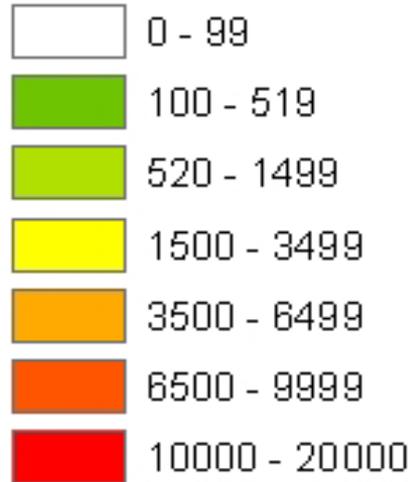
- We are not distinguishing right now between public and private lands
- This is not filtered by “suitability”
- A crude measure of “what you’ve got”



## Legend

### Counties Land Boundary

### Acreeage of Wind Class 4 or Greater



# What's Your Wind?

- VRS3 only scores wind class 3 and higher
- Class 1 and 2 only suitable for small, on-site systems (see VA small wind guide)
- These are readily handled by existing land use planning procedures
- Rockingham, Pulaski, Northumberland Counties have small wind ordinances
- If you only have class 1 and 2 wind, the VRS3 is not needed

# Purpose of Step 2: PreScreening

- ***In Step 2, you will determine if and where wind power in your community is technically feasible—  
are there (a) sufficient wind resources in areas that (b) can be connected to the appropriately-sized electric power lines, and are (c) not notably environmentally sensitive?***

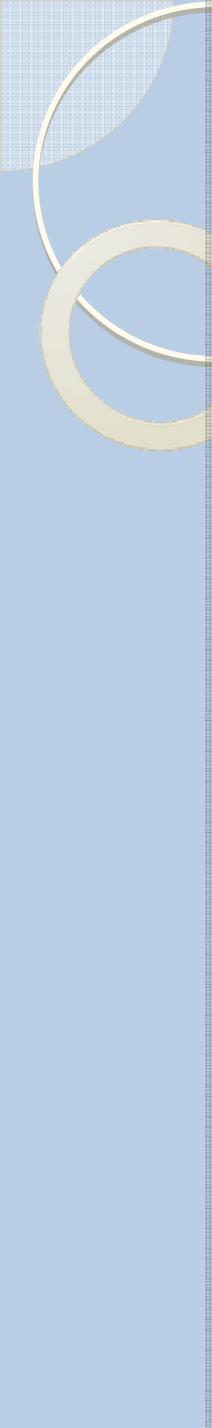
# Basics of Step 2

## A. Identify tracts of land appropriate for scoring

- GIS layer of wind resources
- GIS layers of environmentally sensitive areas and public lands
- Filter out sensitive areas and public lands

## B. Consult with local utility

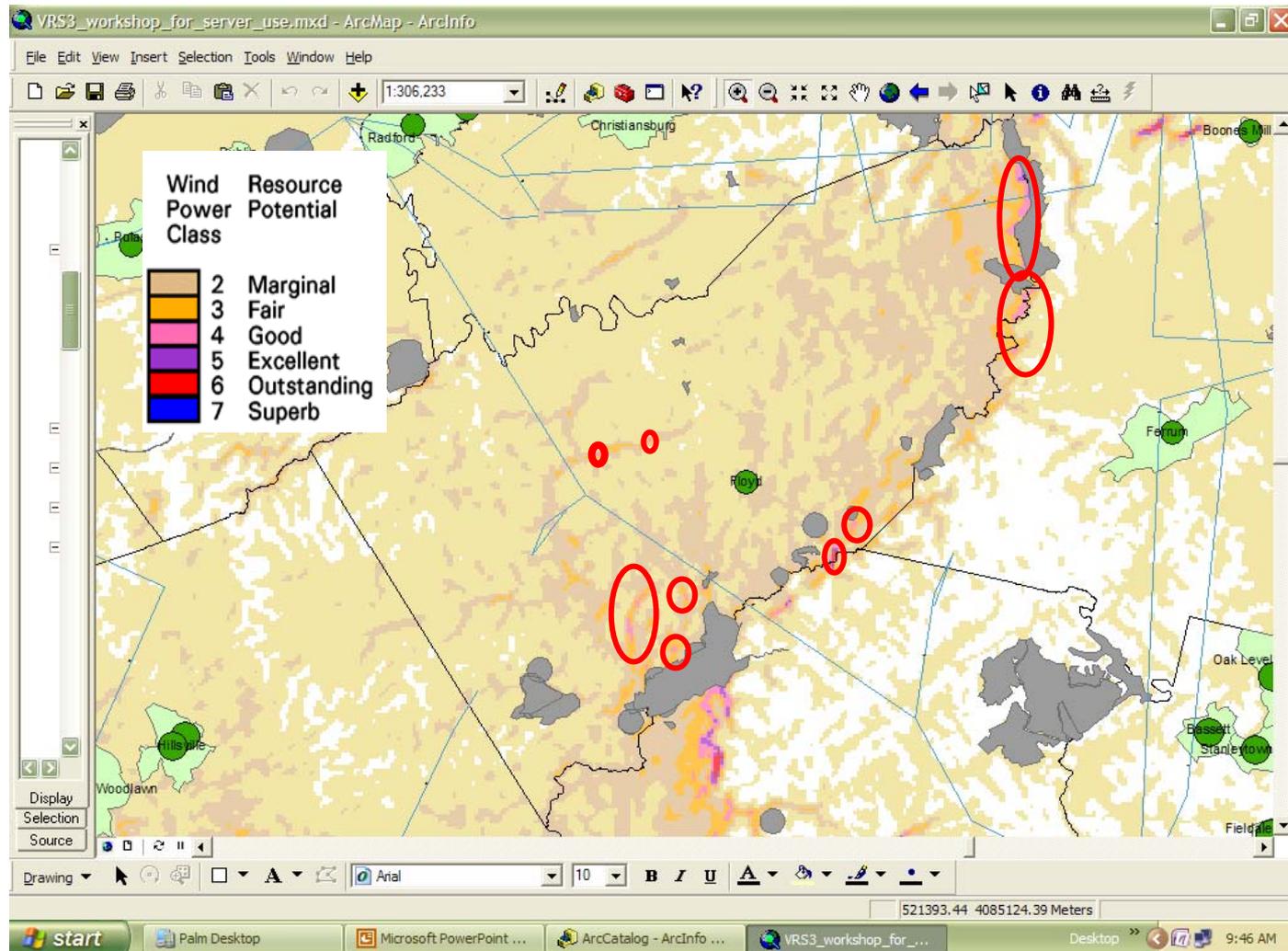
- Provide consolidated GIS to review layer for power line access and distances
- Utility will indicate availability of appropriate lines
- Will only be done for local governments/land use planners



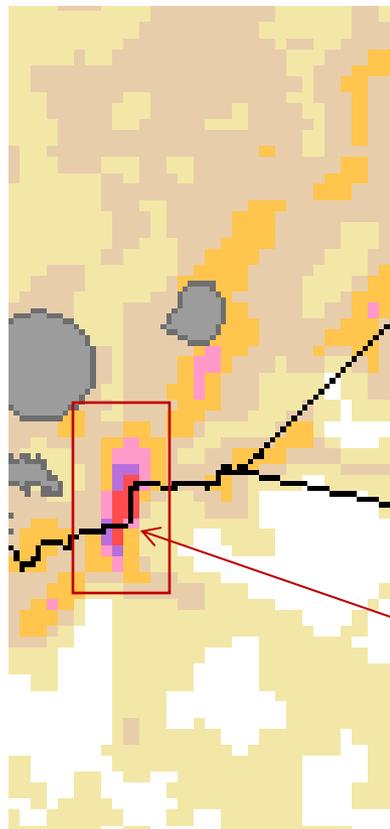
# VRS3 Filters Sensitive Areas and Public Lands

- Federal lands
- Shenandoah National Park and other national parks
- Appalachian National Scenic Trail and 5-mile buffer zone (the AT and 5-mile buffer includes some private land)
- Blue Ridge Parkway
- U.S. Fish and Wildlife Service National Wildlife Refuges
- Virginia Dept. of Conservation and Recreation, Division of Natural Heritage, state parks and natural area preserves
- Virginia Department of Forestry, Virginia state forests
- Virginia Department of Game and Inland Fisheries, Wildlife Management Areas
- Virginia Outdoor Foundation easements
- regions identified as hosting submerged aquatic vegetation

# Identify Tracts for Scoring



# Identify Tracts for Scoring



Wind Resource  
Power Potential  
Class

2	Marginal
3	Fair
4	Good
5	Excellent
6	Outstanding
7	Superb

- Remember, Class 3+ only is scored in VRS3
- Gray in image is sensitive area or public lands
- Each pixel represents 10 acres
- Generate a “tract map” for scoring in next step
- Utility will determine proximity to appropriately sized power lines

# Purpose of Step 3: Scoring

- ***In Step 3, you will score the tracts with electric power line access that you identified in Step 2. You will score community scale wind separately from utility scale wind because of the differences in purpose and size of these systems.***

# The VRS<sup>3</sup> Scores 15 Criteria

## Land Use Planning

1. Compatibility w/ Comp Plan\*
2. Consistency w/ Zoning \*
3. Parcel fragmentation
4. Degree of multiparty consultation

## Natural Resources

5. Fish & wildlife implications\*
6. Cold water streams\*
7. Plant, insect, & natural heritage resources implications\*
8. Forest implications\*
9. Watershed implications\*
10. Special scenic vistas

## Community Development

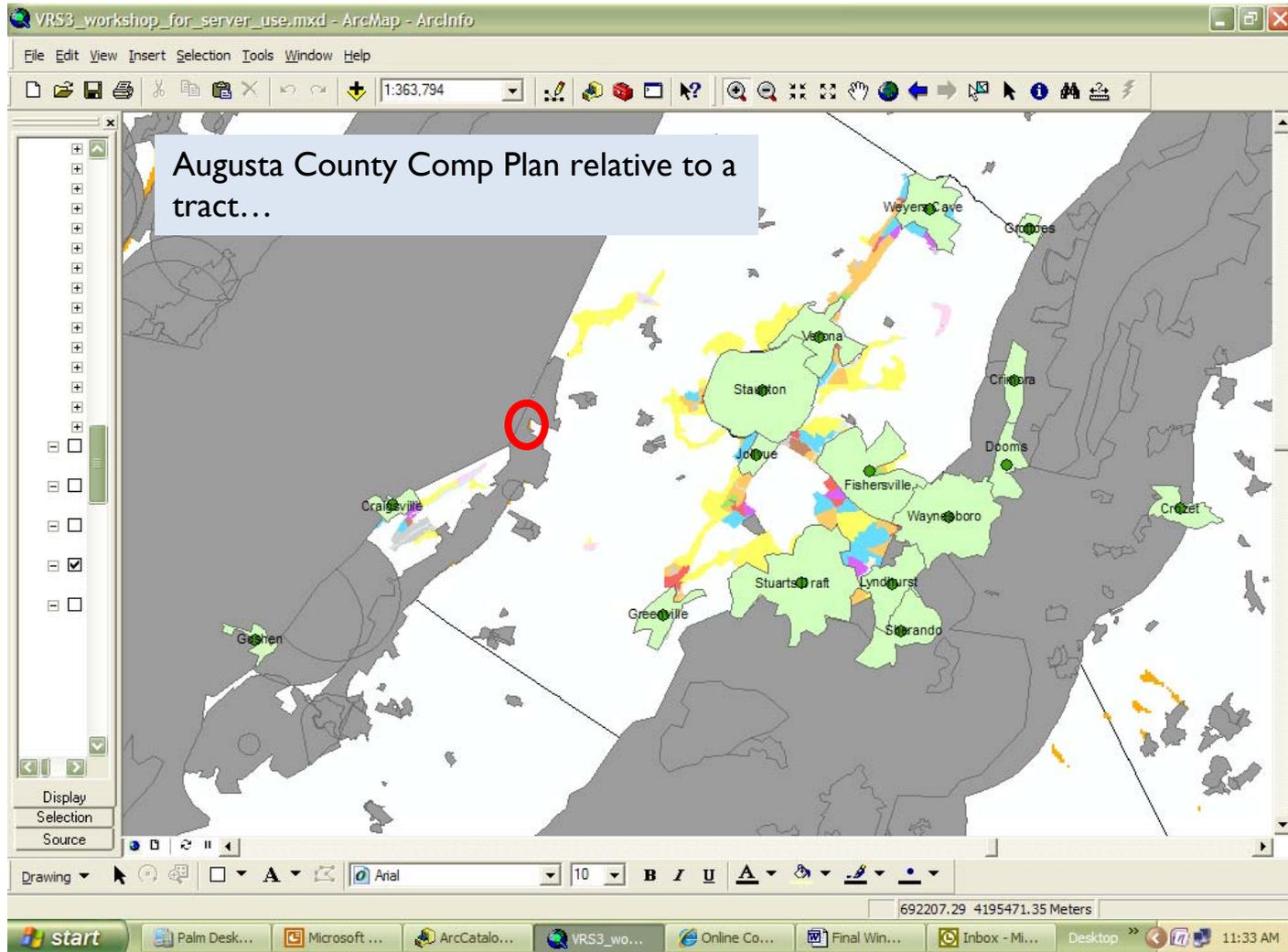
11. Presence of economically disadvantaged communities\*
12. Environmental justice issues\*
13. Preferential land uses
14. Cultural assets\*
15. Recreational value

- Each item scored 0-2
- Total score = 30
- \* = Criteria required by legislation

# A. Scoring Land Use Planning

1. Compatibility w/ Comp Plan\*
  2. Consistency w/ Zoning
  3. Parcel fragmentation
  4. Degree of multiparty consultation
- Scoring requires...
    - tract map from Step 3
    - GIS or paper maps of comp plan
    - GIS or paper maps of zoning designations
    - GIS or paper maps of parcels
    - GIS layers for AT buffer zone, national scenic byways, federal lands, Commonwealth lands, VOF easements

# I. Compatibility with the Comp Plan



# I. Compatibility with the Comp Plan

A. Is the <b>entire tract</b> located on land that is designated as either agriculture or rural conservation (or a combination of both)?	If yes, score = 2 If no, leave blank
B. Are there any proposed or designated land uses that would prevent development of this <b>entire tract</b> for a community scale wind power system?	If yes, score = 1/2 If no, leave blank
C. Consider the level and type of existing development in this tract (residential, commercial, industrial, recreational, urban growth boundary, etc.). Could at least 10 acres of land in this tract be developed for community scale wind power systems <b>without changing</b> the comprehensive plan? (Note: in the base map, 1 pixel is equal to 10 acres)	If yes, score = 1 If no, score = 1/2

**Total Score, consistency with comprehensive plan:**

**-- Enter the lowest of the scores from lines A, B, and C here**

*The score should be ½, 1, or 2. A score of 1 or 2 means there is no fundamental conflict with the comprehensive plan for this tract to be developed for community scale wind power, and that the minimum acreage needed for such a system is available. A score of ½ means that there is a conflict with existing land use or that the comprehensive plan would need to be changed to accommodate a community wind power system.*

# B. Scoring Potential Natural Resource Impacts

5. Fish & wildlife implications\* [DGIF]
  6. Cold water streams\* [DGIF]
  7. Plant, insect, & natural heritage resources implications\* [DCR-DNH]
  8. Forest implications\* [pre-evaluated by DCR]
  9. Watershed implications\* [pre-evaluated by DCR]
  10. Special scenic vistas [local knowledge]
- Legislation requires “natural resources” but does not specify which
  - Scoring requires...
    - Tract map
    - DCR VCLNA GIS resources for forest economics, watershed integrity
    - Reports from VA DGIF and VA DCR-DNH
  - Must submit request for formal review of tracts to DGIF and DCR-DNH

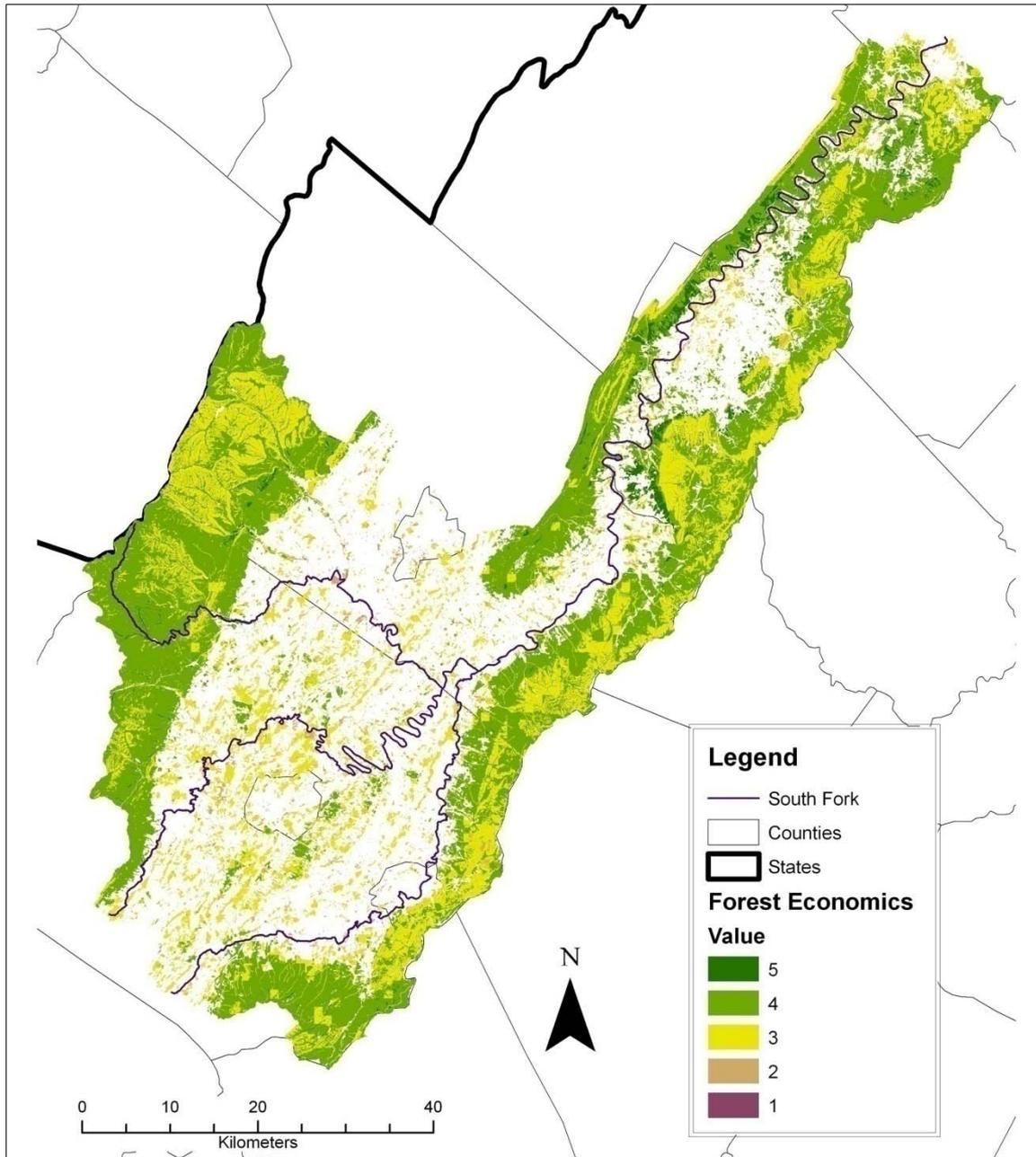
## 5, 6, 7. Wildlife, cold water streams, natural heritage resources, plants, insects, T&E species

These 3 criteria all depend on Commonwealth reports. They are scored very similarly to #5 (fish and wildlife impacts), presented below.

A. Did DGIF recommend that this tract, in its entirety, should not be developed for a wind power system?	If yes, score = 0 If no, leave blank
B. Did DGIF recommend that this tract, in its entirety, could be developed for wind energy without any mitigatory measures for wildlife impacts?	If yes, score = 2 If no, leave blank
C. Did DGIF recommend that at least part of this tract could be developed for wind energy with some mitigatory measures for wildlife impacts?	If yes, score = 1 If no, leave blank
D. Did DGIF recommend that at least part of this tract could be developed for wind energy with substantial mitigatory measures for wildlife impacts?	If yes, score = ½ If no, leave blank
<b>Total Score:</b>	
<p>-- If A is scored 0, then enter 0 on this line and go on to #7.</p> <p>-- If B is scored 2, then enter 2 on this line and go on to #7.</p> <p>--Otherwise, please enter the higher of scores C and D here and go on to #7.</p>	

## 8, 9. Forest Value and Watershed Integrity

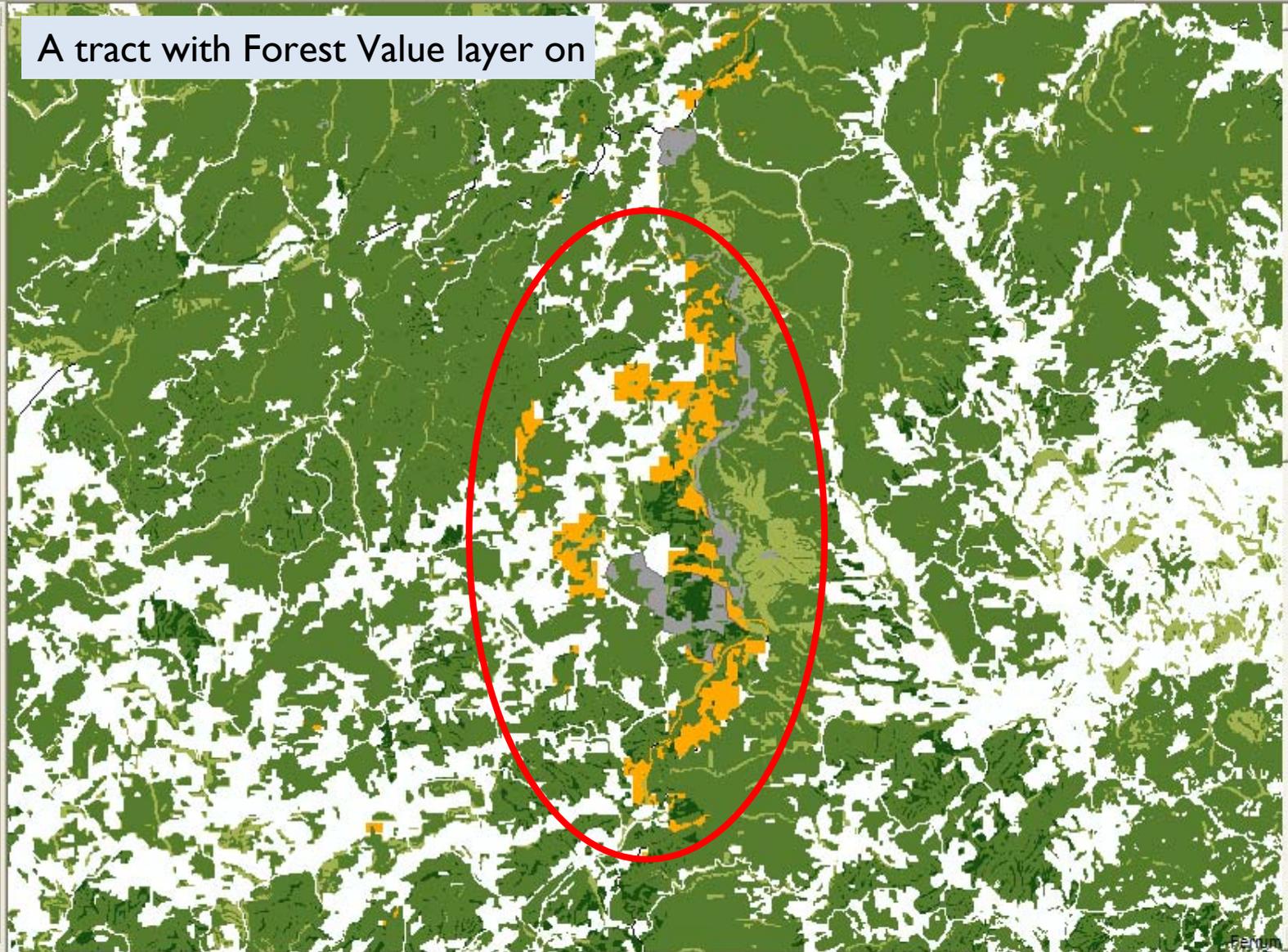
- These scores require GIS resources from the VCLNA
- Forest Value: a composite measure of the biological and economic value of forest land
- Watershed Integrity: a composite measure of the contribution of land to water quality, both surface and ground water



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A tract with Forest Value layer on

- 161
- 230
- 345
- 500
- Transmission\_oth  
CATEGORY
- Below 230kV
- 230kV - 344kV
- 345kV - 499kV
- 500kV - 734kV
- Birdsurvey\_va
- VCLNA\_forest\_ec  
ForEconVal
- VCLNA\_cultural  
TOT\_VALUE
- Census Designate
- Federal Lands pe
- LCS Private Land:
- LCS Public Lands
- FutureLandUses
- PlanningPolicyAre
- VA Bats



# 9. Special Scenic Vistas

<p>A. Does this tract contain a scenic vista or overlook that is popular with tourists and the local community? (You will need to use personal knowledge of local scenic attractions to score this item.)</p> <p><i>Note: please do not include overlooks from the national scenic byways or national park vistas in this item. These have been accounted for in criterion #4.</i></p>	<p>If no, score = 2 If yes, score = 1</p>	
<p style="text-align: right;"><b>Total Score:</b></p> <p style="text-align: center;"><b>-- Please enter the score for line A here</b></p>		

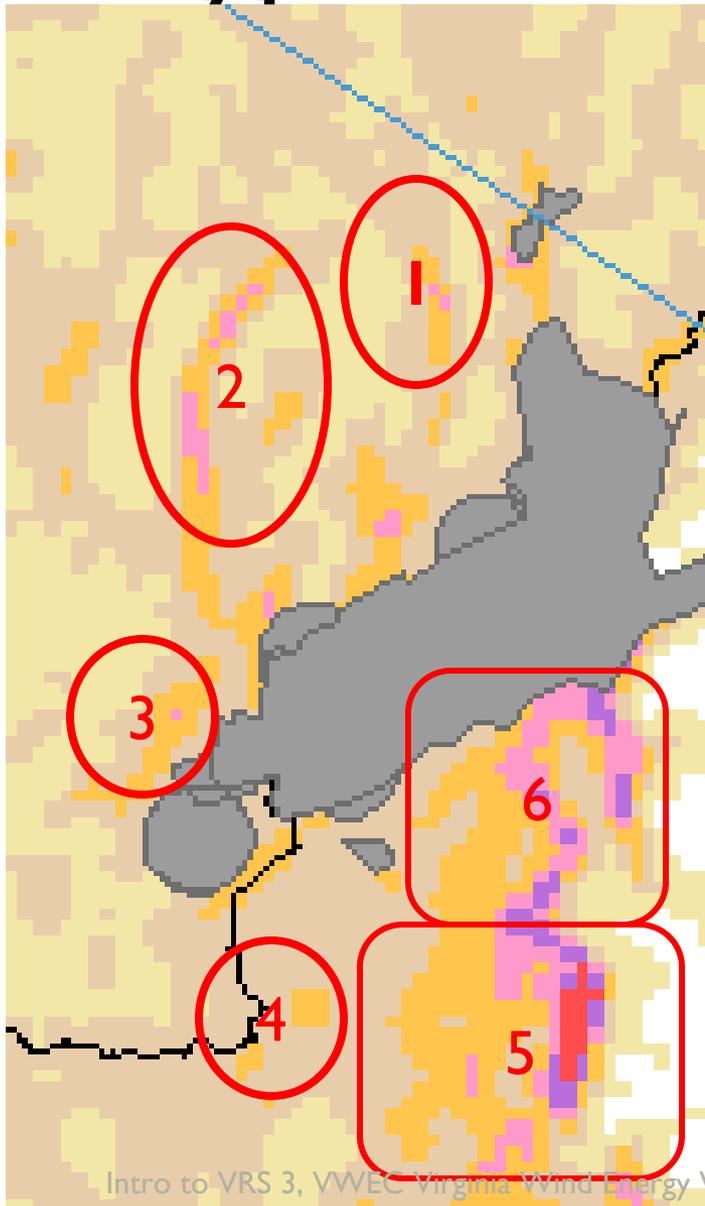
# Scoring Wrap Up

- Community Scale (class 3+) is scored separately from Utility Scale (class 4+)
- Both scoring systems are fundamentally the same. They differ only where size matters (acreage, potential # of turbines, etc.) In these situations, the scoring is tweaked to reflect the differences (eg, parcel fragmentation, available acreage)
- What about public lands???

# How to Use the Scores

- Scores can be measured against the “ideal” maximum of 30, which reflects a tract with no preliminary limitations for wind power
- Scores can be used to evaluate one tract against another
- Scores will highlight the strengths and weaknesses of different tracts for wind power development
- Allows communities to highlight their most sensitive places and concerns
- Allows jurisdictions to incorporate wind power into the comprehensive plan or zoning

# A Hypothetical Case



- We started w/ 6 tracts
- No power lines for tracts 3 and 4
- We score tracts 1, 2, 5, 6 for Community Scale Wind