

Opportunities for Wind Power in Virginia and the Role of the Virginia Wind Energy Collaborative

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Joint Meeting of the Commission on Electric Utility Restructuring
Virginia Coal and Energy Commission

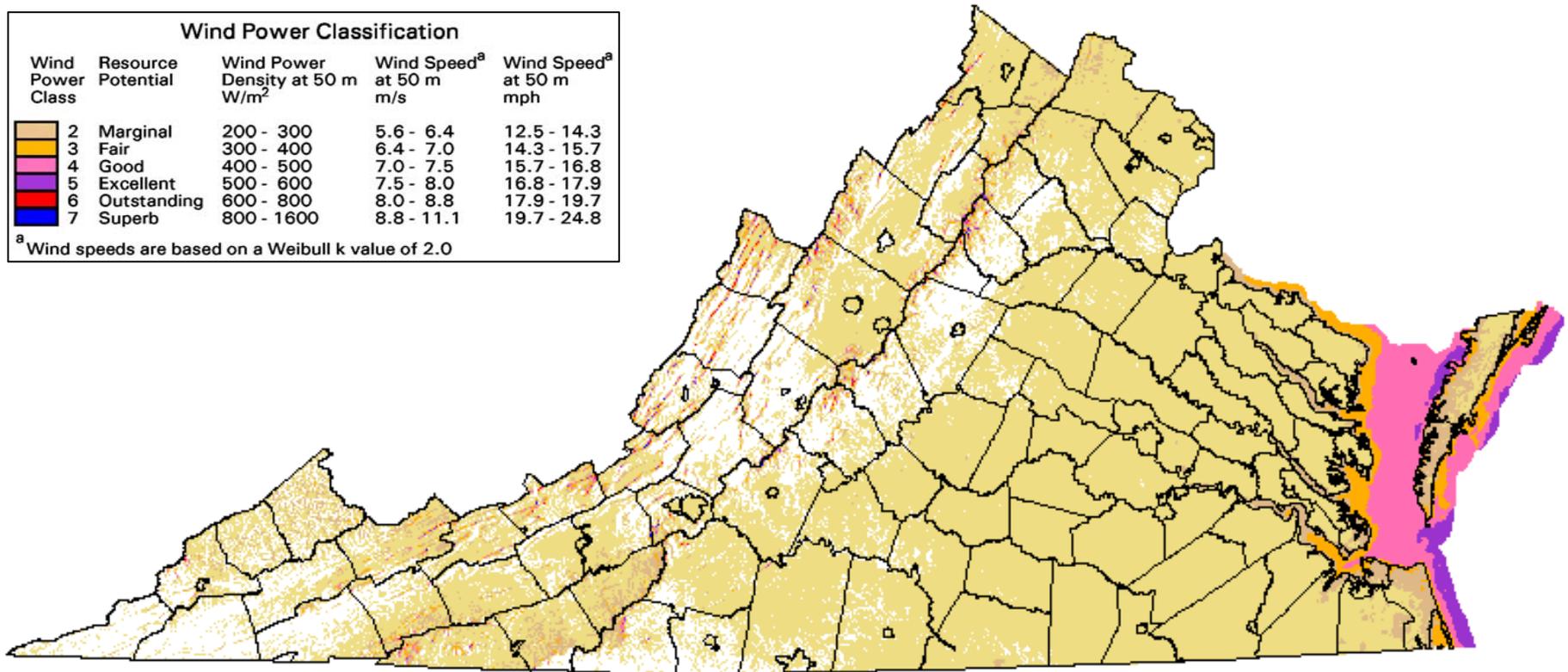
08 September 2004



Virginia wind resource map

Wind Power Classification				
Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m^2	Wind Speed ^a at 50 m m/s	Wind Speed ^a at 50 m mph
2	Marginal	200 - 300	5.6 - 6.4	12.5 - 14.3
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	800 - 1600	8.8 - 11.1	19.7 - 24.8

^aWind speeds are based on a Weibull k value of 2.0

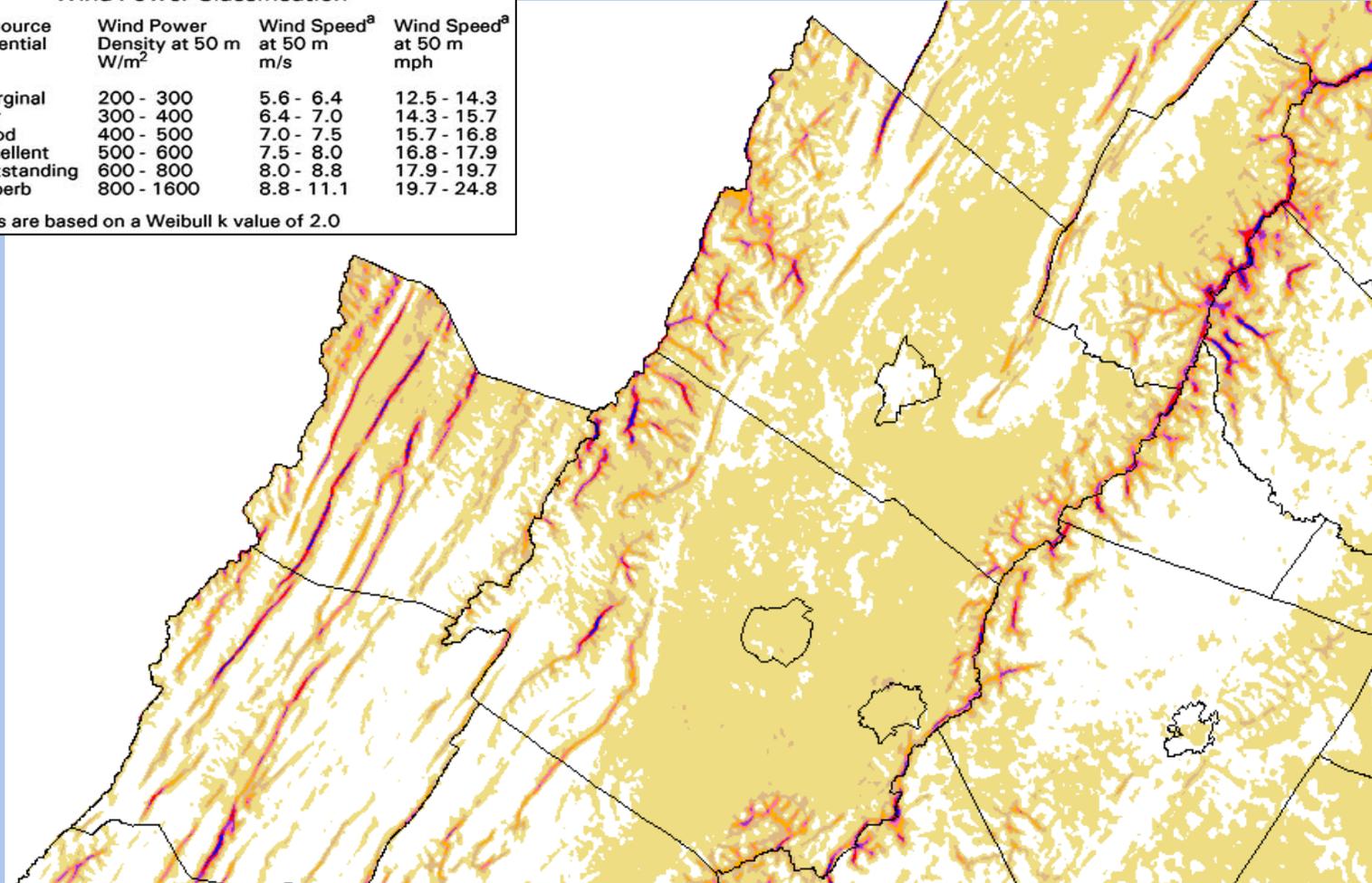


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Virginia wind resource by land category

Owner	Area (sq. km) in Wind Power Density Class					Total	Distribution
	3	4	5	6	7		
<i>Fish and Wildlife Service</i>	80	7				452	Class 3+ 1.0%
<i>National Park Service</i>	119	67	35	29		1,088	2.9%
<i>Forest Service</i>	598	291	145	102	36	12,674	13.5%
<i>Department of Defense</i>	33					1,191	0.4%
<i>Federal Land (other)</i>						70	0.0%
<i>State Park</i>	5	2	1	1		252	0.1%
<i>Regional Park</i>						50	0.0%
<i>Mines</i>	7	2	1	1		304	0.1%
<i>Private</i>	844	265	61	38		86,664	14.0%
<i>Inland Waterway</i>	50	46				791	1.1%
<i>Atlantic (3 nautical miles)</i>	277	823	566			1,729	19.3%
<i>Chesapeake Bay</i>	923	3,018	181			5,507	47.6%
Total	2,936	4,521	990	171	36	110,772	100.0%
Percent of Total Area	2.65	4.08	0.89	0.15	0.03	100.00	

courtesy of Mr. George Hagerman



2002: Wind Powering America – Virginia DMME Initiative

- Expand State-Based Anemometer Loan Program (JMU)
- Establish VA-based wind-related WWW site (JMU)
- Conduct regional outreach and **establish state-wide working group** (all)
- Develop green power certificate program for Virginia municipalities (ERT)
- Study coalfield development opportunities (VT-ARI)





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Alden Hathaway – Local government wind energy purchase as an EPA-approved clean air implementation measure





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George Hagerman – Coalfield wind energy development opportunities





2002: State Energy Project – Small Wind in Virginia Now!

- Create and implement a plan for the development of small wind systems and wind power markets throughout Virginia
- Identify opportunities for wind power at federal facilities, on U.S. Forest Service land, and in rural areas
- Research and address barriers to small wind development
- Conduct small wind system economic feasibility analyses
- Facilitate formation of VA inter-faith coalition for renewable energy
- Develop small wind guidebook for Virginia





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Mitch King – *Perspectives of other alternative and renewable energy providers*



Ken Jurman – Program Administrator



Geraldine Nicholson – Executive Director, VWEC



Mark Lotts – VWEC/JMU Projects Administrator



Debra Jacobson – Consultant and Adjunct Law Professor



The *Virginia Wind Energy Collaborative* is dedicated to promoting the responsible development of wind energy in Virginia. As such, VWEC recently hired an executive director to develop a business plan to guide its future. Elements of the business plan include the expansion of VWEC membership to include other interested stakeholders and the promotion of markets for wind energy in Virginia by facilitating the procurement of wind energy by interested parties.



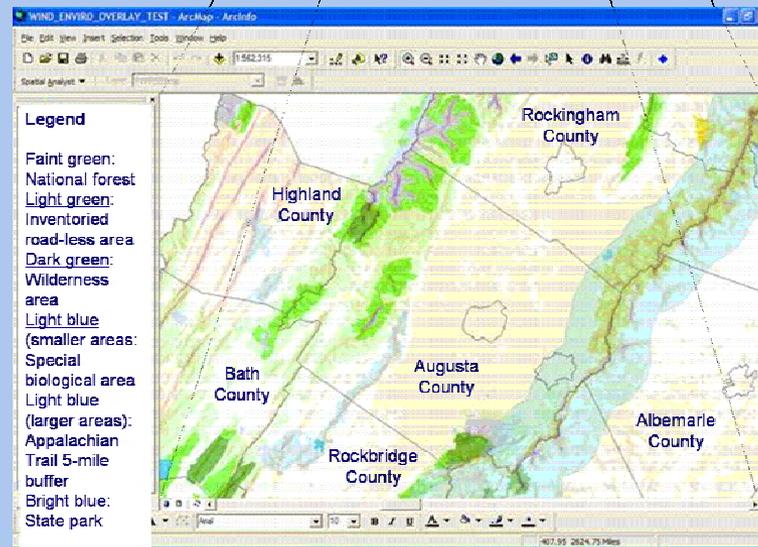
What is happening with large wind power in Virginia?

- A handful of developers are actively studying the potential for projects; their activities to date include wind measurements, site studies, and land-lease negotiations. A wait-and-see attitude prevails at present.
- In comparison to neighboring states in the mid-Atlantic, Virginia is lacking in terms of *installed wind projects* (none to date), *county-level policies and processes to facilitate projects* (VWEC has provided assistance to several counties), and *customer demand* (also being addressed actively by VWEC).
- VWEC supports the development of a GIS-based tool by a Virginia-based Environmental Working Group to be used to assess potential impacts of large wind in regions of significant wind resource. This will be released in September 2004.

Sample segment of Environmental-GIS tool



The high-resolution Virginia Wind Resource Map produced by TrueWind Solutions, LLC.



A section of the enhanced Virginia Wind Resource Map with several of the environmental GIS layers displayed.

Where are the opportunities?

- With continued support for outreach and development of cost-effective mechanisms for purchasing wind power, large wind development will become more economically attractive.
- The best markets today for wind energy are in de-regulated states north of Virginia. Virginia could potentially provide wind energy to these markets, thus allowing dollars to flow into the Commonwealth.
- With continued support for interaction with local governments to promote education and address siting issues, *responsible* large wind development will be enhanced.



What is happening with small wind power in Virginia?

- At present only a few small wind turbines are installed throughout Virginia.
- The *Small Wind in Virginia Now!* project will finish in early 2005 and will provide numerous new tools and information to support increased small wind development.
- The *Virginia Small Wind Incentives Program* is passing through its first round and has, to date, made four awards. The amount of each award is calculated based upon the economics unique to each project proposed.
- *Last night* the Rockingham County Planning Commission approved for consideration by the Supervisors what may become Virginia's first small wind-specific zoning amendment.

Ongoing efforts supported at JMU

*State-Based Anemometer Loan
Program (funded)*

*Small wind turbine at JMU
(funded)*

*WPA–DMME efforts to
promote awareness and education
(funded)*

*Small Wind in Virginia Now!
(funded)*

Ongoing efforts supported at JMU

State-Based Anemometer Loan Program (funded)

Small wind turbine at JMU (funded)

Next Step (funded)

FEMP/Wallops (funded)

Virginia Small Wind Incentives Program (funded)

SBALP Participants

Legend

VA Met Tower Current



VA Met Tower Past



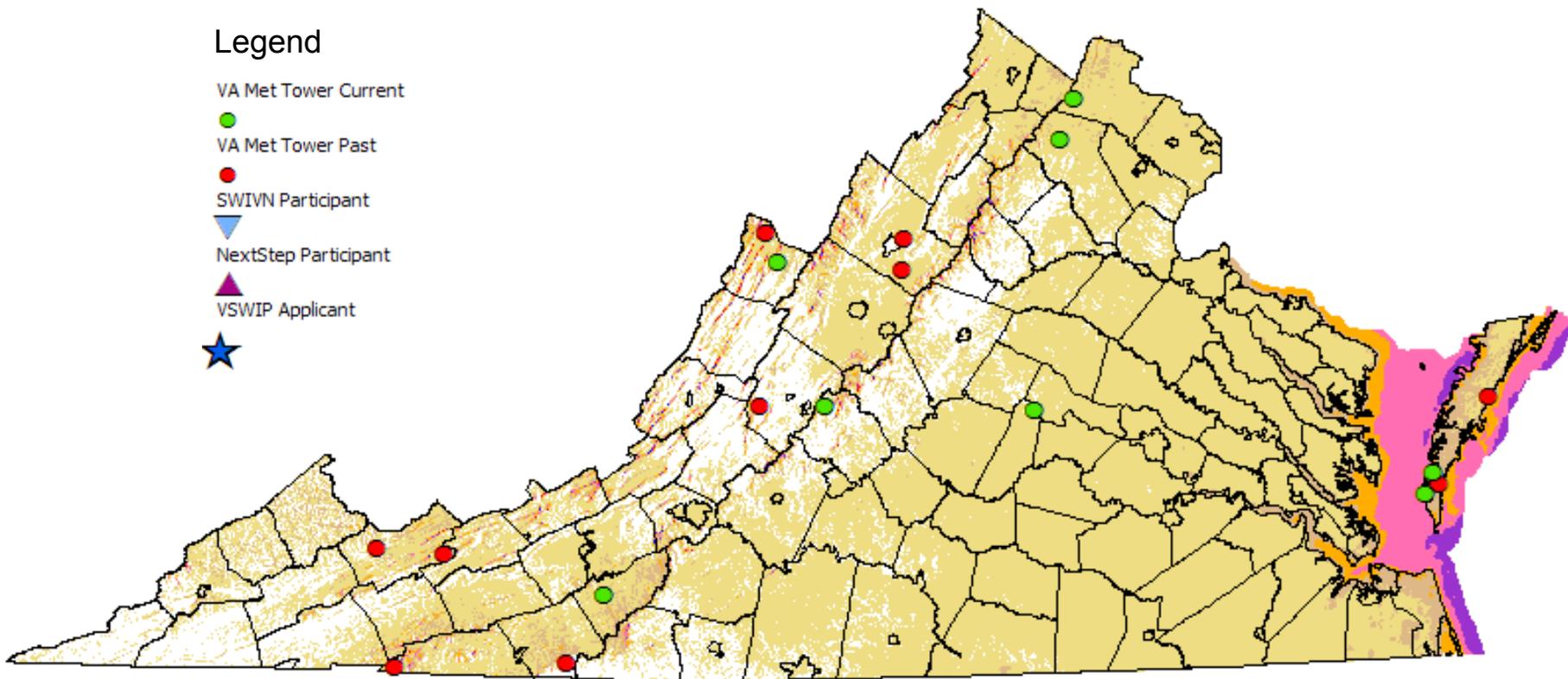
SWIVN Participant



NextStep Participant



VSWIP Applicant



SWIVN! and Next Step Participants

Legend

VA Met Tower Current



VA Met Tower Past



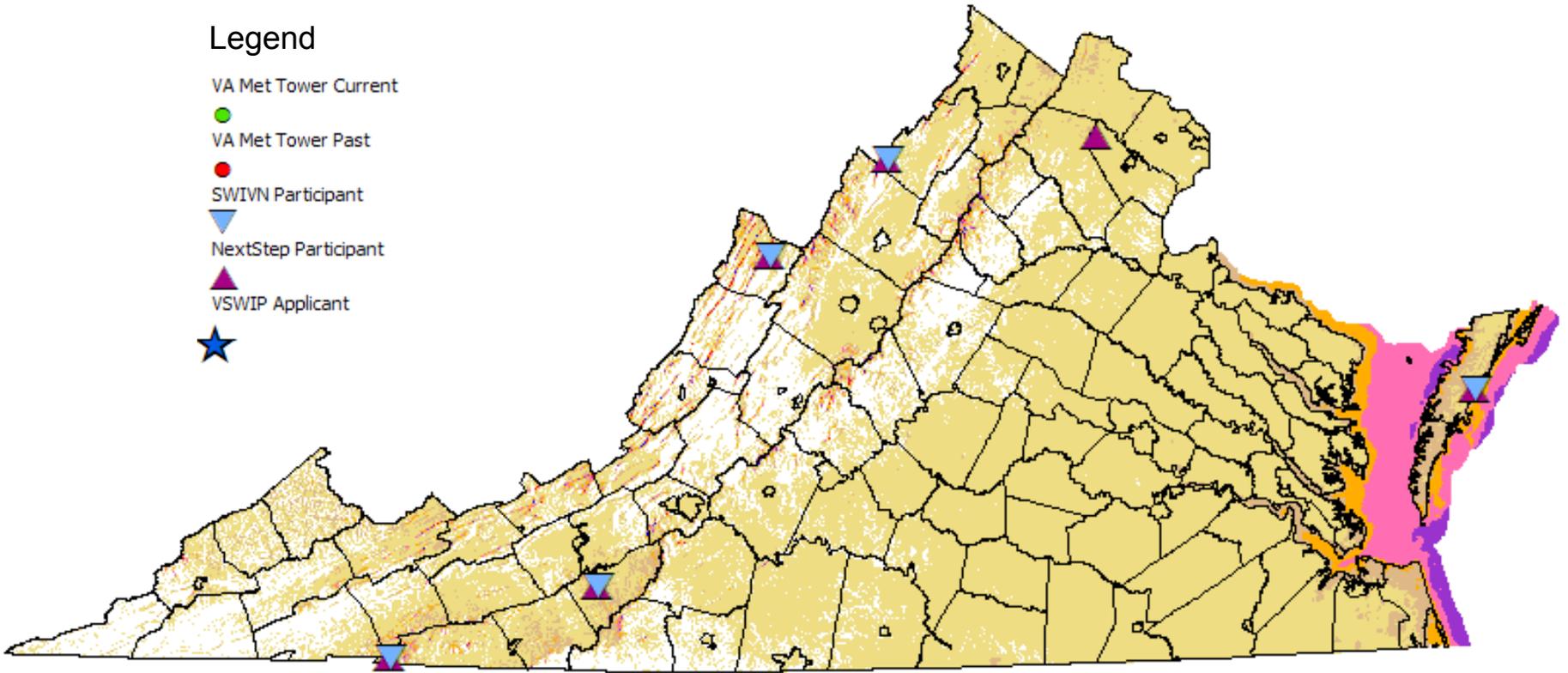
SWIVN Participant



NextStep Participant



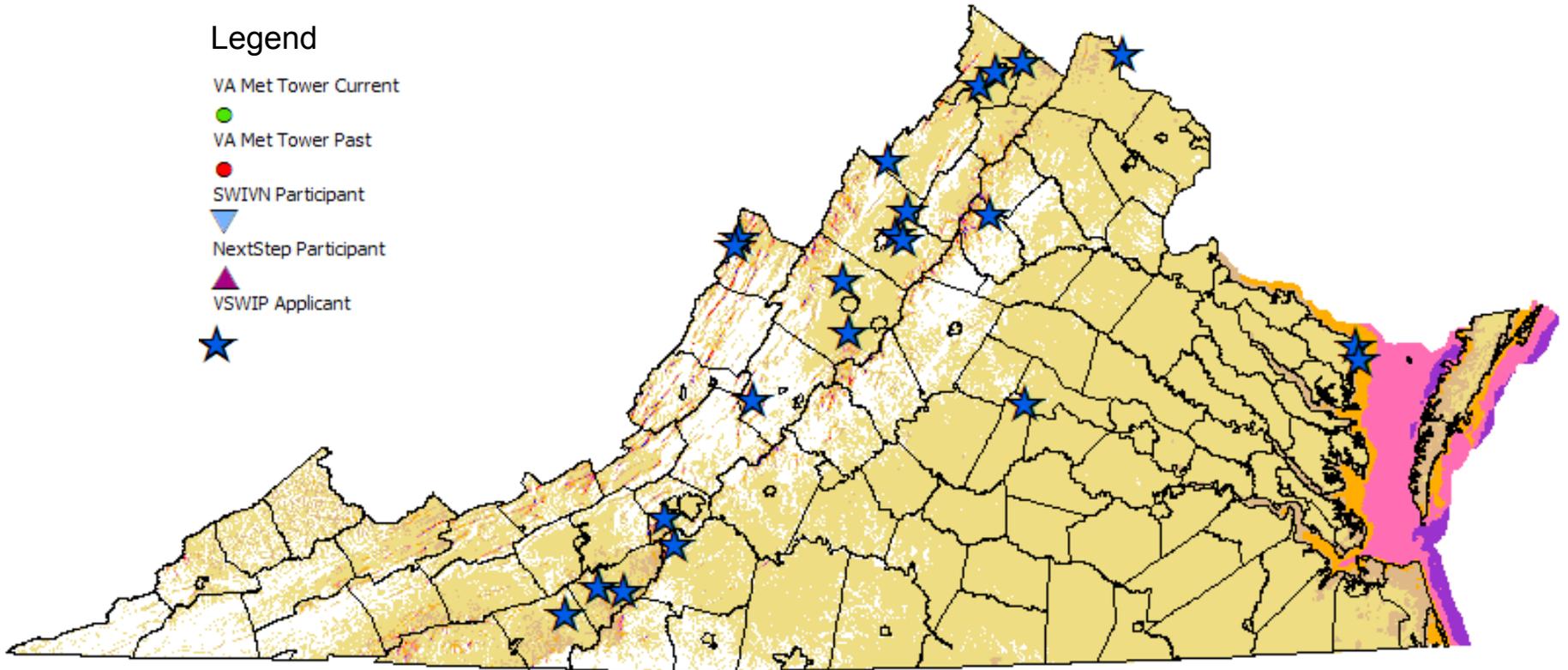
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VSWIP Applicants

Legend

- VA Met Tower Current
- VA Met Tower Past
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Since 2002 over 500 residents of Virginia have actively participated in VWEC-sponsored activities

Legend

VA Met Tower Current



VA Met Tower Past



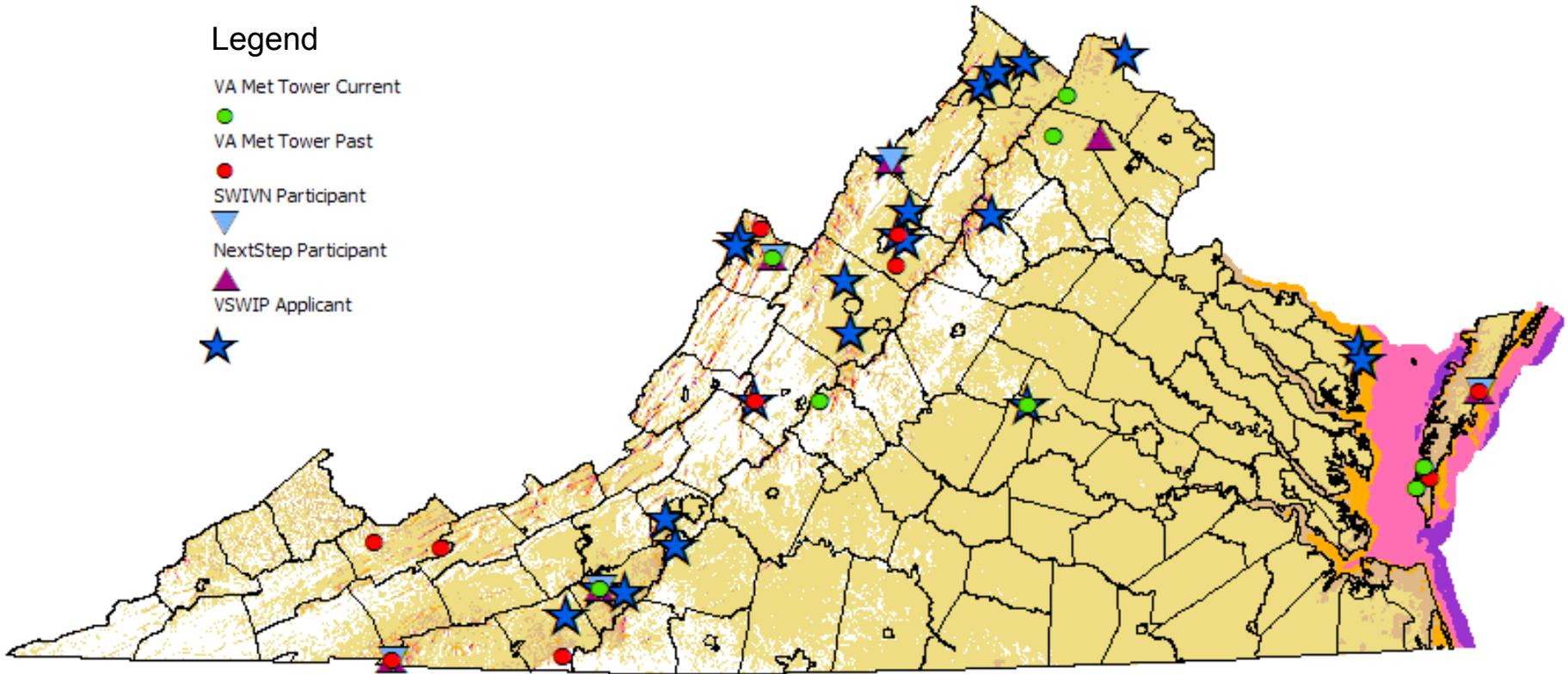
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