

# Investing in Sustainable Forestry

## Wakefield, VA



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03/27/09

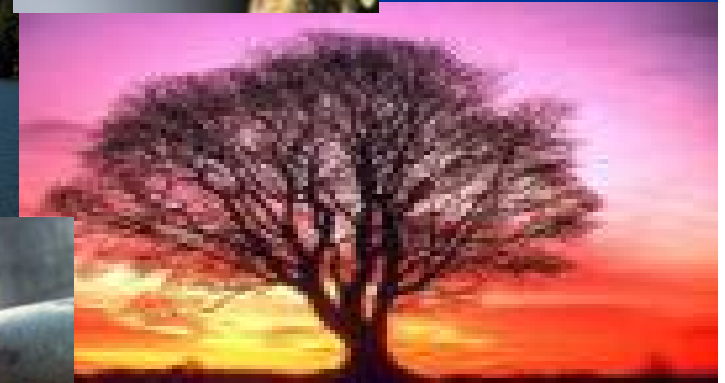
# Criteria

1. Biodiversity
2. Forest Productivity
3. Forest Health
4. Soil and Water Conservation
5. Carbon Cycles

# Ecosystem Services

... the benefits received from our natural capital

CO<sup>2</sup>



# Externalities

CARBON



BIODIVERSITY



Decision Making  
Process

Land Clearing  
Costs

Land Value  
Cost



Building  
Construction  
Costs

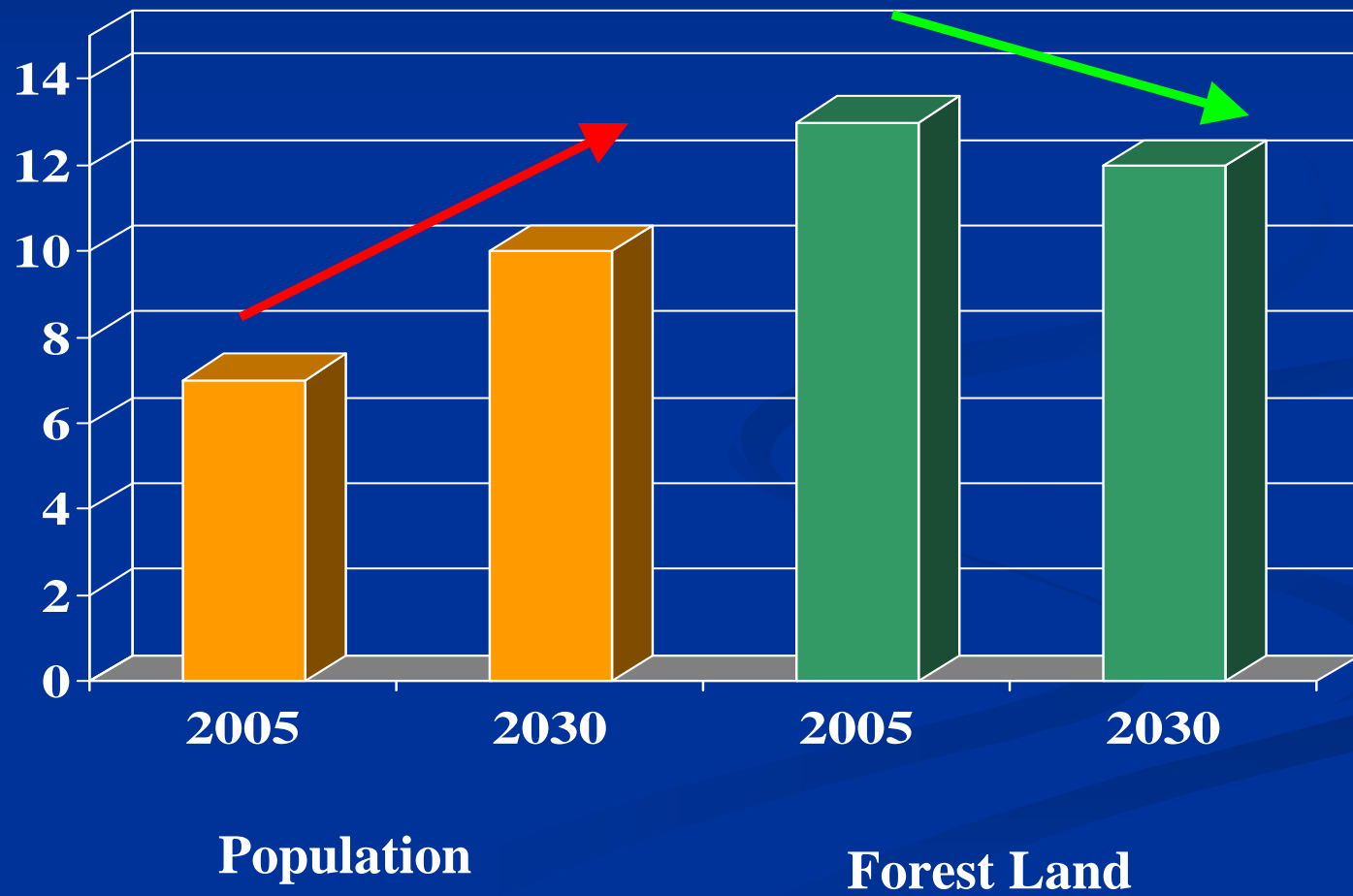
WATER



AIR



# 3 Million More People 1 Million Fewer Forest Acres



# Virginia's \$25 billion forest products industry Needs Support to Conserve Forest Land!

- *We can't get our water quality offshore*
- *We can't get our wildlife habitat offshore*
- *We can't get our viewsheds offshore*
- *We can't get our air quality offshore*





## Market-based conservation is part of the solution...

Markets and payments for ecosystem services are a means of capturing the true value of well-managed forests and agricultural lands. Payments for carbon sequestration, watershed management, habitat, and a host of other services may supplement traditional revenues and promote good stewardship, especially when used with other conservation tools.

# Why Favor Environmental Solutions?

	<b>WWTP Upgrade</b>	<b>Forestry Practice</b>
Pollutant of Concern	<b>YES</b>	<b>YES</b>
Other Pollutants	<b>NO</b>	<b>YES</b>
Wildlife Habitat	<b>NO</b>	<b>YES</b>
Carbon Sequestration	<b>NO</b>	<b>YES</b>
Stormwater Management	<b>NO</b>	<b>YES</b>
Recreation	<b>NO</b>	<b>YES</b>

How can we enhance landowner participation in emerging ecosystem service markets and enhance their income stream provided by their working forests and agricultural lands?

What tools or mechanisms can we develop that enable us to better account for the loss of ecosystem services as we smartly develop our landscape?

How can we tap into the tremendous opportunity provided by corporate environmental stewardship as we develop our municipal infrastructure and grow our residential and commercial needs?

# Ecosystem Services of Interest

- Carbon Sequestration
- Water Quality
  - Nutrient load reduction
  - Sediment loading
- Air Quality
- Wildlife/Biodiversity

# Credit Calculation

*The Foundation of the Effort*

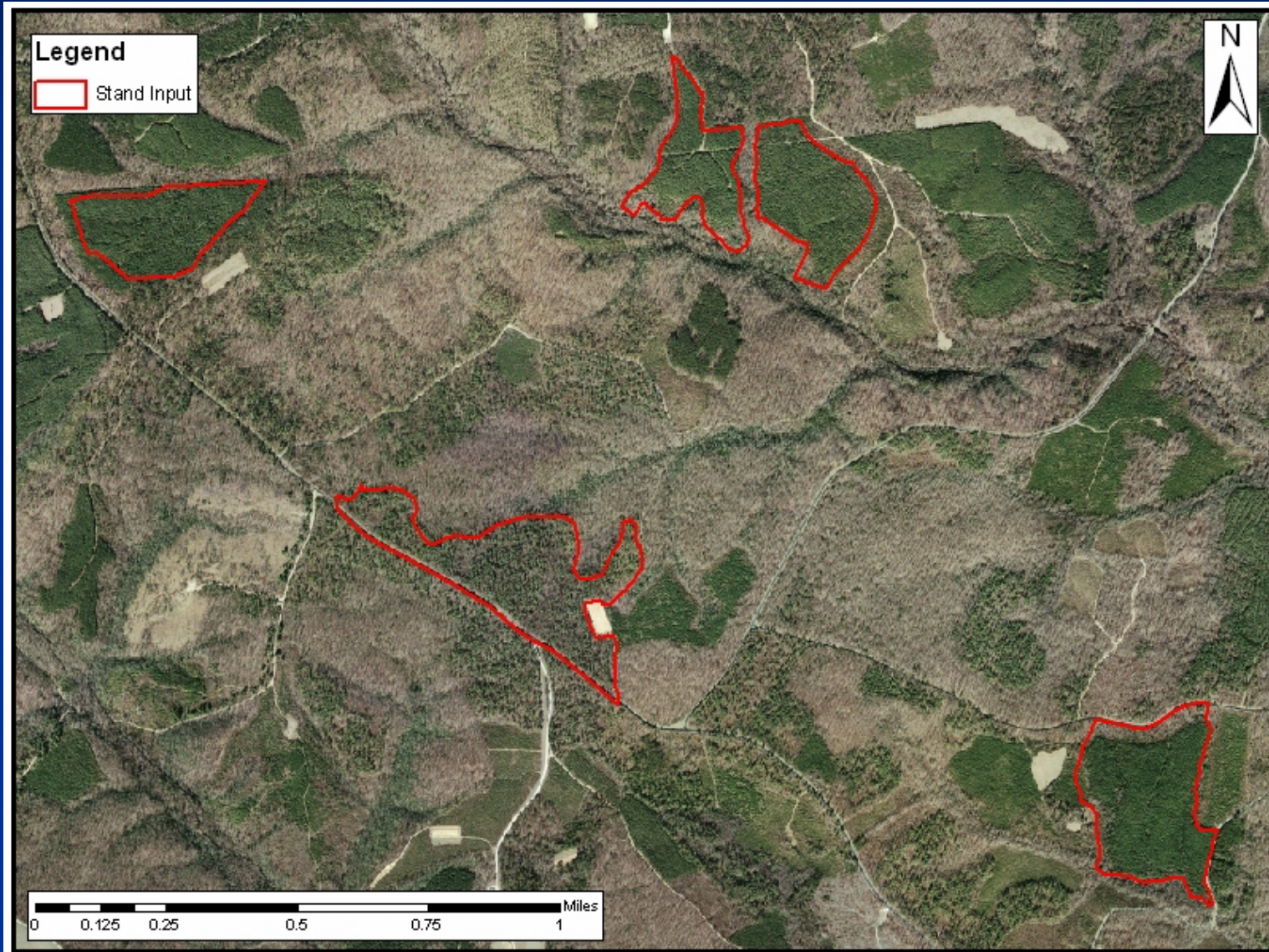
- Good metrics are important
  - Must be backed by science
  - Must meet existing regulatory criteria



**QUALITY CREDIT**  
(Quantity for market or mitigation)



# Stand Input



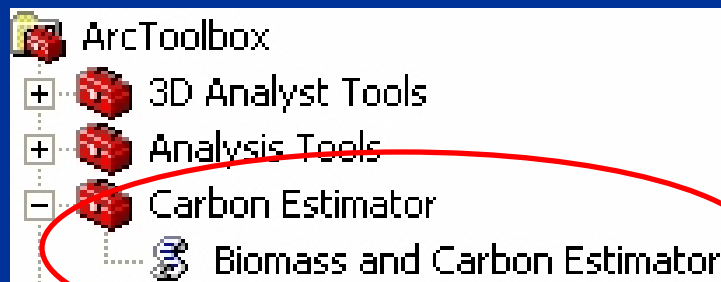
# Stand Attributes

Minimum Inputs Required:

- 1) Stand Age
- 2) Trees per Acre
- 3) Mean Height of Dominant and Co-dominant trees

FID	Shape ^	FOREST	STAND	TYPE	Age	TPA	Dom_Height
0	Polygon	AB	22	LP	18	373	27.98829
1	Polygon	AB	07	LP	45	92	59.85302
2	Polygon	AB	28	LP	21	330	34.90125
3	Polygon	AB	34	LP	16	417	20.10906
4	Polygon	AB	41	LP	25	230	40.29462

Record: 1 Show: All Selected Records



# Biomass and Carbon Estimates

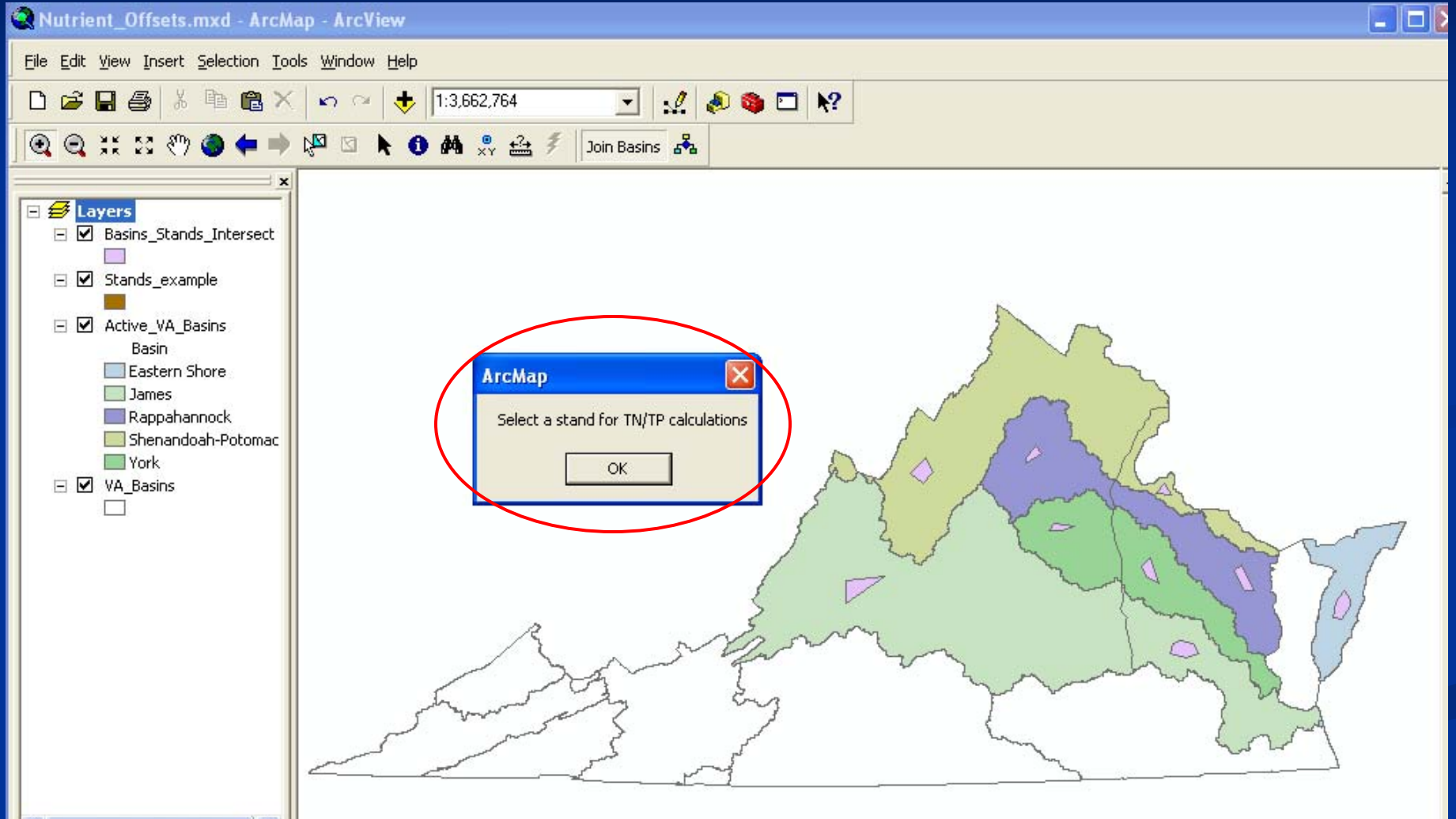
stemBM	branchBM	cRootsBM	fRootsBM	foliage2BM	foliage1BM	woodyDebBM
19.2	2.8	6.3	3	1.9	2	0.2
37.2	4.1	9.4	3.9	1.7	2	9.2
28.4	3.7	8.7	4	2.3	2.4	0.5
10.5	1.7	3.8	1.8	1.4	1.5	0.1
29.8	3.6	8.7	3.9	2.1	2.2	0.8

Biomass estimates for the stem, branches, coarse roots, fine roots, first and second cohorts of foliage, and woody debris are added to the stand's attribute table.

MgPerHa	TonsPerAc	Std_Acres	C_Mg	C_Tons
12.95	5.7768	27.284688	142.99001	157.618
22.5	10.0369	52.43351	477.42999	526.271
18.4	8.20796	22.960449	170.968	188.45799
7.55	3.36794	29.342438	89.652199	98.823601
18.85	8.4087	43.652428	332.995	367.06

Total above ground carbon estimates in Mg/Ha and Tons/Ac, stand acreage, and stand total above ground carbon in Mg and Tons are also added to the stand's attribute table.

# Nutrient Credit Trading



# Nutrient Credit Trading – DEQ/DCR

## Sediment Load Reduction – Infiltration

### ■ Practices

- Ag land conversion to Forest
- Agricultural BMPs
- Stream restoration work

### ■ Potential Applications

- Municipal water supplies (reservoir life, treatment costs)
- Stormwater management
- TMDLs

Forests in Chesapeake Bay are valued at over \$30 billion annually - more than seafood industry. *\*not including water or recreation benefits* (TCF & Forest Service, 2006)



# How Does Forest Cover Influence Air Quality?



## Pollutants

(ozone, PM, SO<sub>x</sub>, NO<sub>x</sub>)

## Objectives

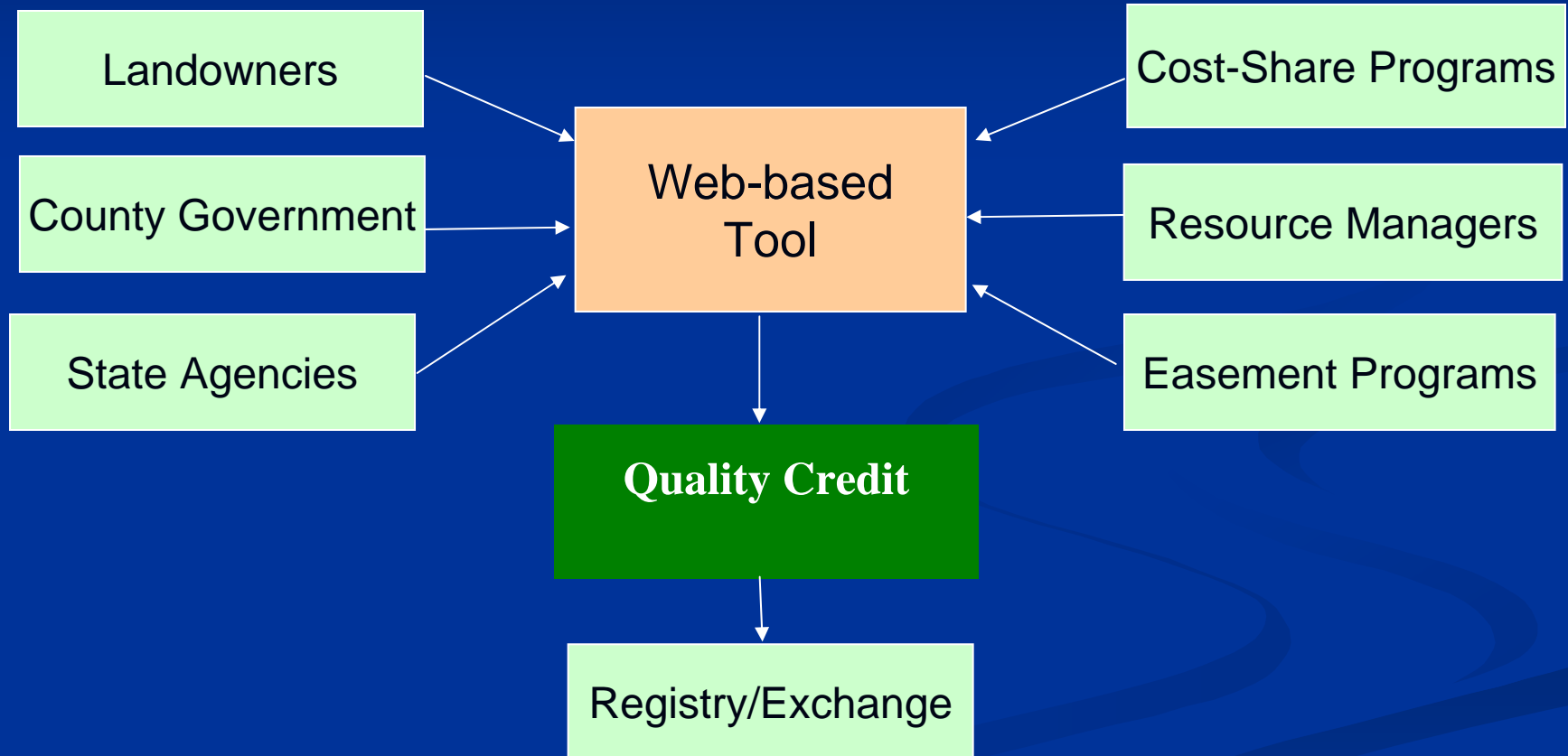
- Determine a science based physical measure for air quality credits
- Explore voluntary mitigation opportunities or market-based solutions

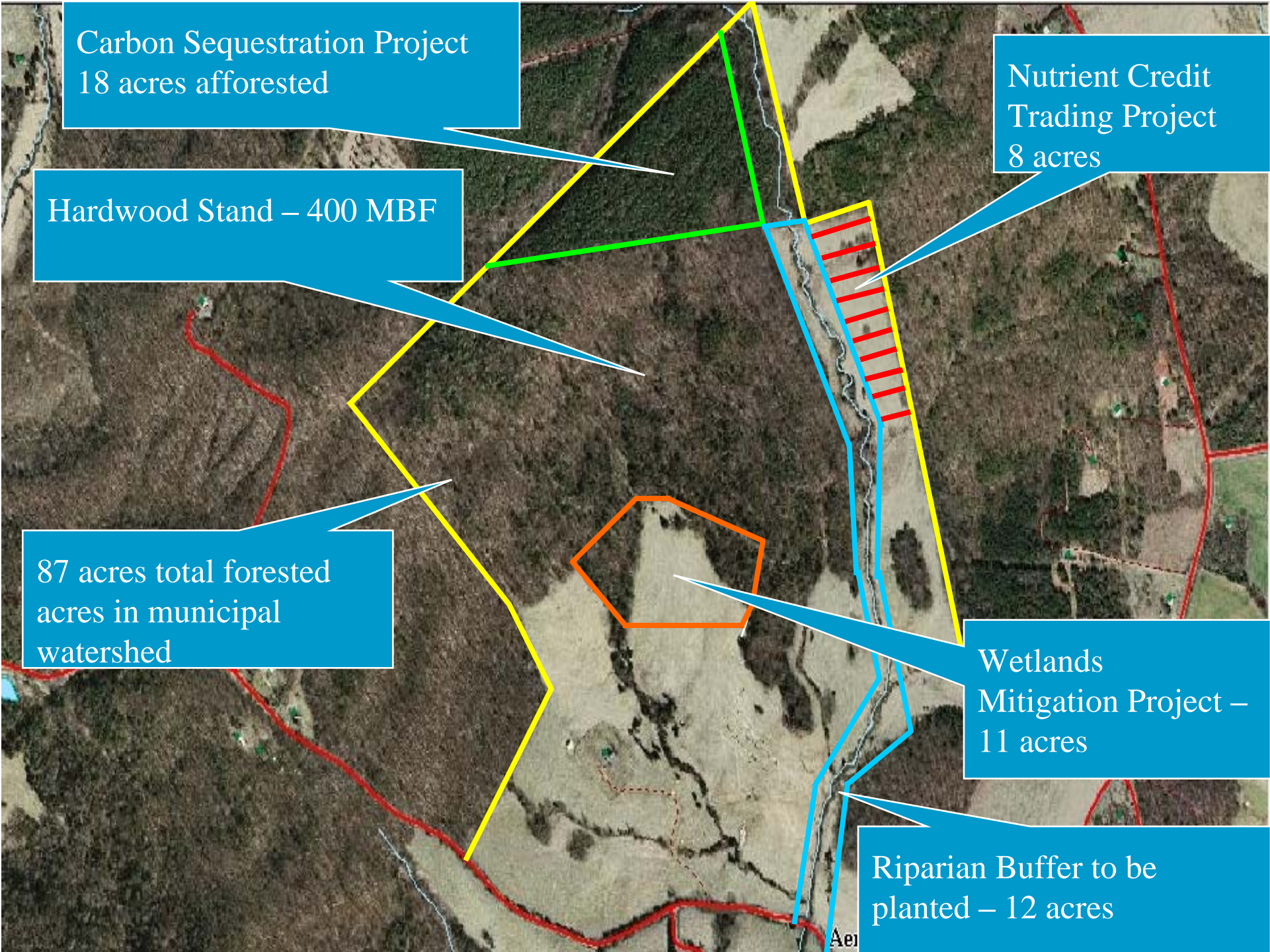
## Current Effort

- Center for Chesapeake Communities/USFS/VDOF
- Building on Dr. Dave Nowak's work

# Potential Applications

just to get you thinking...





Carbon Sequestration Project  
18 acres afforested

Nutrient Credit  
Trading Project  
8 acres

Hardwood Stand – 400 MBF

87 acres total forested  
acres in municipal  
watershed

Wetlands  
Mitigation Project –  
11 acres

Riparian Buffer to be  
planted – 12 acres



## Farm Bill: Food, Conservation, and Energy Act of 2008

*Sec 2709:*

*The new Farm Bill authorizes USDA  
to create a Federal framework to  
facilitate Environmental Services  
Markets.*



*Sally Collins named Director of the newly  
created Office of Ecosystem Services and  
Markets under the Secretary of  
Agriculture.*

# Needs

1. Development process must be dynamic to reflect legislation, existing agency programs, regulatory drivers, and stakeholder input. Collaboration is needed!
2. Education and training in developing ecosystem service portfolios and marketing those services
3. Cost analyses to enhance the landowner and community based decision making process
4. Marketing strategy for voluntary credit purchases (Corporate stewardship, socially responsible investing (SRI), public relations, etc.)
5. Progress forward is dependent on funding opportunities and bullet #1



# Questions?

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