



## Virginia View Curriculum

<b>Lesson Plan</b>	Virginia's Forest Cover
<b>Grade Level</b>	6 (Science), High School Earth Science
<b>Applicable Virginia SOL</b>	6.9a, ES7
<b>Summary</b>	Students will learn about the value of forested areas, investigate forest cover using maps, and learn about public land management agencies in Virginia.
<b>Classroom Materials</b>	This lesson can be completed with or without computers with internet access. To use without computer access, print the materials and handouts listed under "Teacher Prep."
<b>Submitted by</b>	Lisa McCray, retired High School Teacher, Consultant and Volunteer

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## Teacher Guide

### Applicable Virginia SOL:

6.9 The student will investigate and understand public policy decisions relating to the environment. Key concepts include

- a) management of renewable resources (water, air, soil, plant life, animal life);

ES.7 The student will investigate and understand the differences between renewable and nonrenewable resources. Key concepts include

- a) fossil fuels, minerals, rocks, water, and vegetation;
- b) advantages and disadvantages of various energy sources;
- c) resources found in Virginia;
- d) making informed judgments related to resource use and its effects on Earth systems; and
- e) environmental costs and benefits.

### Teacher Preparation:

This can be quite a long exercise, or it can be shortened. For the data collection part of the exercise, consider splitting students into groups, or only assigning certain counties (10 with interstates, and 10 without, for example). Collaboration on the answers to the first two sections of the exercise could be very helpful.

The Forest Management section could be omitted, or would also make a good homework assignment.

Review the student worksheet. Review how to perform the calculations (averaging, estimating percent cover) with the students. For the data table, the metrics for each county can also be found online at <http://cnre.vt.edu/forsite/forestcommunity/countymap/>

Print out (one per group of students) or save links (if using a classroom with computers) for:

- The map "Forest Cover of Virginia 2000" from the [Digital Atlas of Virginia](#), which can be accessed as:
  - A map, including interstates, attached at the end of this document
  - PDF at [http://gep.frec.vt.edu/Digital\\_Atlas\\_PDFs/VA\\_Forest\\_2000.pdf](http://gep.frec.vt.edu/Digital_Atlas_PDFs/VA_Forest_2000.pdf)
  - Interactive Web Mapper - [http://arc.gis.vt.edu/Forest\\_Cover/](http://arc.gis.vt.edu/Forest_Cover/) (note: May be slow to load, please be patient)
  - Data service to be used in ArcGIS (Add GIS Server <http://arc.gis.vt.edu/arcgis/services>, select the "VAView" folder, add the Forest\_Cover data service).
  - Data service to be used in ArcGIS Explorer or ArcGIS Explorer online [http://arc.gis.vt.edu/ArcGIS/rest/services/VAView/Forest\\_Cover/MapServer](http://arc.gis.vt.edu/ArcGIS/rest/services/VAView/Forest_Cover/MapServer)
- For each student, a student worksheet, data table, and county key



6. If you were a manager for VDOT or other agency responsible for decision-making about road building, would it be wise to base your decision off your answer to question number 5? What other factors do you need to take into consideration?

### **Exercise: Assessing forest cover**

One way that land managers can make informed decisions that affect our valuable resources, such as forest cover, is by assessing impacts quantitatively (using measurements and numbers to gain information). You will complete this exercise to see how a land manager might use a map to collect data and make an informed decision.

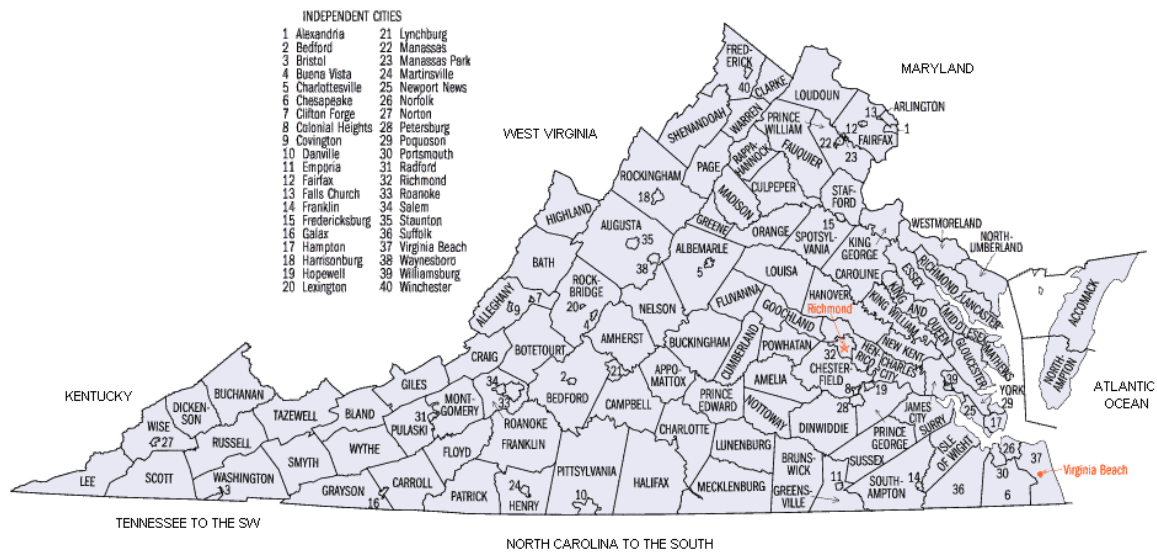
Using the map “Virginia Forest Cover (2000)” and the table below, estimate the percentage of forested cover for each county in Virginia. Indicate on the table if an interstate passes through the county. A county key is attached to the exercise. We will be ignoring the independent cities for this exercise. Your teacher may split you into groups or only give you selected counties to complete.

Once you have estimated the percentage of forest cover for a county, multiply the total square miles of land in the county by the percentage forest cover to determine an approximate forested land area for that county.

County Name	Acreage (in sq. miles)	Percent Forest Cover Estimate	Acreage of Forested Land	Interstate passes through (y/n)?
Accomack	723			
Albemarle	723			
Alleghany	446			
Amelia	357			
Amherst	475			
Appomattox	334			
Arlington	26			
Augusta	971			
Bath	532			
Bedford	755			
Bland	359			
Botetourt	543			
Brunswick	566			
Buchanan	504			
Buckingham	581			
Campbell	504			
Caroline	533			
Carroll	476			
Charles City County	182			
Charlotte	475			
Chesterfield	426			
Clarke	177			
Craig	330			
Culpeper	381			
Cumberland	298			
Dickenson	333			
Dinwiddie	504			
Essex	258			
Fairfax	396			
Fauquier	650			
Floyd	382			
Fluvanna	287			
Franklin	287			
Frederick	415			
Giles	358			
Gloucester	217			
Goochland	284			
Grayson	443			
Greene	157			
Greensville	296			
Halifax	814			
Hanover	473			

Henrico	238			
Henry	382			
Highland	416			
Isle of Wight	316			
James City	143			
King and Queen	316			
King George	180			
King William	275			
Lancaster	133			
Lee	437			
Loudoun	520			
Louisa	498			
Lunenburg	432			
Madison	322			
Mathews	86			
Mecklenburg	624			
Middlesex	130			
Montgomery	388			
Nelson	472			
New Kent	210			
Northampton	207			
Northumberland	192			
Nottoway	315			
Orange	342			
Page	311			
Patrick	483			
Pittsylvania	978			
Powhatan	261			
Prince Edward	353			
Prince George	266			
Prince William	338			
Pulaski	321			
Rappahannock	267			
Richmond	192			
Roanoke	251			
Rockbridge	600			
Rockingham	851			
Russell	475			
Scott	537			
Shenandoah	512			
Smyth	452			
Southampton	600			
Spotsylvania	401			
Stafford	270			
Surry	279			

Sussex	491			
Tazewell	520			
Warren	214			
Washington	564			
Westmoreland	229			
Wise	403			
Wythe	463			
York	106			



**County Key Source: U.S. Census Bureau**

7. Once you have the chart completed, compute the following (show work on back):
  - a. Average percent cover of counties with interstates: \_\_\_\_\_
  - b. Average percent cover of counties without interstates: \_\_\_\_\_
  - c. Total forested land in Virginia counties (remember units): \_\_\_\_\_
8. Using the data you collected and analyzed above, would you say that interstate location and lack of forest cover are linked? What other factors in addition to (or instead of) road building may be contributing to less forest cover in areas with interstates?

## Public Forest Management in Virginia

### National Forests in Virginia

On the internet, go to <http://www.fs.fed.us/>

In the drop-down menu next to State, select Virginia

GO

Click on George Washington National Forest

1. How many National Forests are there in Virginia? \_\_\_\_\_
2. What are the names? \_\_\_\_\_
3. How many acres in these forests are in Virginia? \_\_\_\_\_
4. Give four services or uses these forests provide.

\_\_\_\_\_

\_\_\_\_\_

Click on About the Agency



5. How is the US Forest Service funded? \_\_\_\_\_

### State Forests

Use the state forest map.

6. Which state forest is nearest you? \_\_\_\_\_

On the internet, go to <http://www.dof.virginia.gov/stforest/state-forest-map.htm>

Click on the state forest nearest you.

7. Give two pieces of information about your forest.

\_\_\_\_\_

\_\_\_\_\_

8. Why is Big Woods (21) on the dof site but not on the State Forests Map above from the same source?



On the internet, go to <http://www.dof.virginia.gov/index.shtml>

Click on State forests

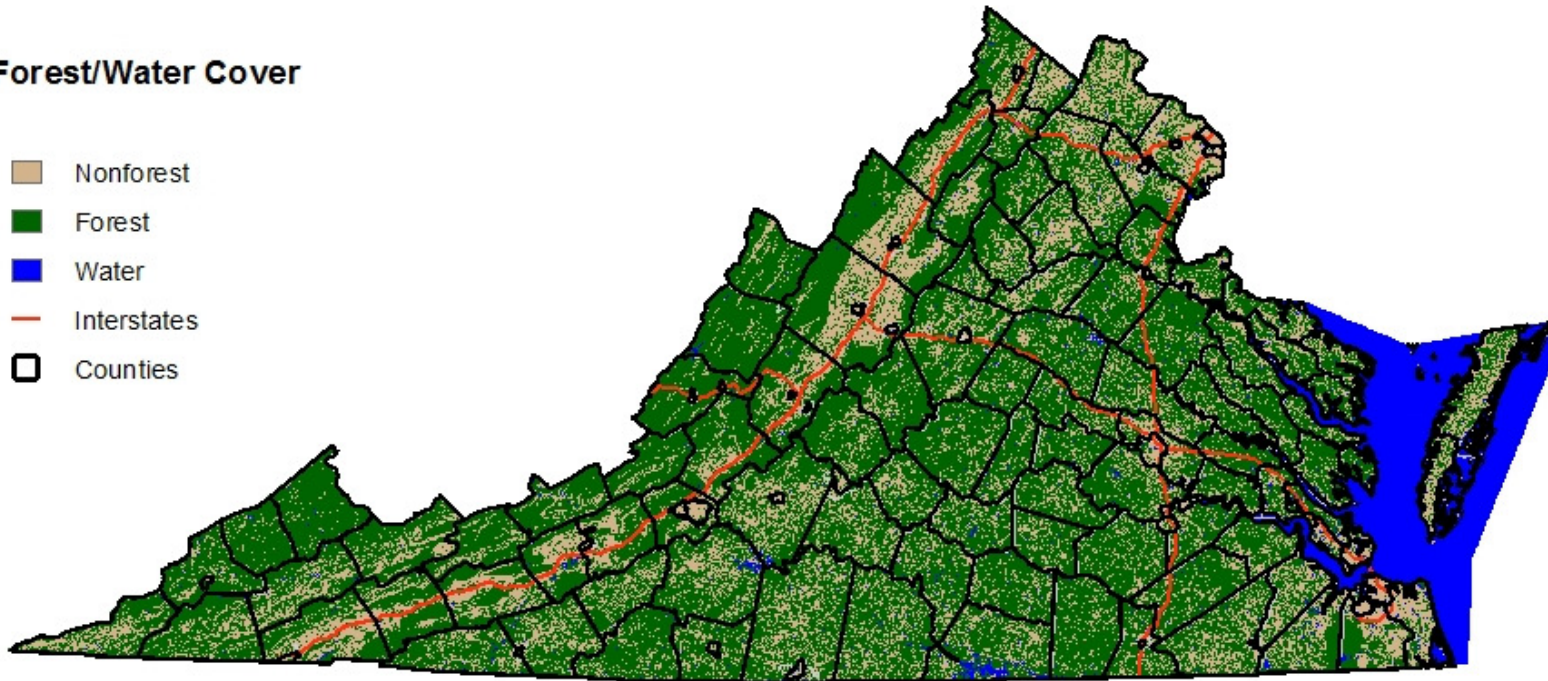
9. How are state forests funded? \_\_\_\_\_
10. How many state forests are there? \_\_\_\_\_
11. List two more services or uses that you found on this page.

\_\_\_\_\_

# Virginia Forest Cover (2000)

## Forest/Water Cover

- Nonforest
- Forest
- Water
- Interstates
- Counties



Data source: Virginia Digital Atlas, [www.virginiaview.net](http://www.virginiaview.net)

## Resources

Digital Atlas of Virginia: [http://virginiaview.cnre.vt.edu/digital\\_atlas.html](http://virginiaview.cnre.vt.edu/digital_atlas.html)

A map-based resource designed for Virginia teachers. The Digital Atlas contains many different maps pertinent to Virginia in several accessible formats.

<http://www.dof.virginia.gov/index.shtml>

<http://www.dof.virginia.gov/stforest/state-forest-map.htm>

Virginia Department of Forestry, State forest map for Virginia. Interactive map.

<http://www.web2.cnre.vt.edu/4h/treecalculator/ecoservices.cfm>

Tree value calculator for Urban Trees\*.

<http://cnre.vt.edu/plt/>

Project learning tree – wide variety of learning activities and modules organized by grade level and Virginia SOL.

<http://pubs.ext.vt.edu/420/420-181/420-181.html>

Cost, value, benefits of Urban Trees\*

<http://www.fs.fed.us/>

United States Forest Service

<http://cnre.vt.edu/forsite/forestcommunity/countymap/>

Interactive map of forest cover for the Mid-Atlantic States, organized by county. A nice tool for gathering data.

\*It is important to note that Urban Trees and Forests do not typically serve the same ecological or environmental purposes. The exercise and map focus on Forests, not Urban Trees (trees viewed individually). However, the information on these sites can be helpful in planning a lesson.