

Urban and Developed
Systems Ecology and
Management

Virginia Master Naturalist
Basic Training Course

Investigating Online Tools for Urban Forestry

Overview

This lesson plan is intended to serve as an interactive activity to accompany a presentation on urban and developed systems during the Virginia Master Naturalist basic training course for volunteers. It involves using three different online tools relating to urban forestry. You can try out any or all of the tools, depending on the time allotted. They can be used in the middle of a presentation on urban systems in order to break up the lecture into smaller chunks. You can also use this activity as a homework assignment. Note that all three tools are web-based and do require an Internet connection.

Objectives

- Become familiar with and know how to use several online tools relating to urban forestry.

Part One – Runoff Calculator

This tool will allow you to calculate the amount of nitrogen and phosphorus runoff from a developed property and investigate how improvements to the site may decrease the runoff.

Leader Instructions

1. Before class, gather information about a specific property to examine. It could be your home, or the place where the class meets. You also may ask the class to bring this information for their own properties with them to class.
2. You will need to know the following information to plug into the calculator: Street address; Acreage; Percentage of the property that is buildings, driveway/sidewalk, managed turf/lawn, and forested or open space; Number of downspouts and how many flow to an impervious surface; Estimated volume of any rain barrels; Estimated square footage of any rain gardens.

Materials

- Internet connection, computer, and projector

Other Resources

- Urban and Developed Systems Ecology and Management multimedia presentation and handout
- Urban and Developed Systems background readings

Time

Allow 15 minutes per online tool, or 45 minutes for all three tools.

3. The James River Runoff Calculator can be found at <http://whatsinyourrunoff.com>. This calculator was designed by the James River Association, but it will work for other watersheds as well.
4. At <http://whatsinyourrunoff.com>, you will first see an “about” page. You can click “OK” to make that disappear. Then, at the top of the page, you can enter the address of the property you wish to investigate. Once the location is found, click the button that says “calculate runoff.”
5. You will be asked to enter several values in terms of land use and management, lot size, and lot type. Enter all of these values, or use the default values, and then click “show live chart.” A chart will pop up with current estimated levels of nitrogen and phosphorus runoff for the property.
6. Leave the chart open, but go back to the calculator and try changing the variables to reflect potential improvements to the property, such as adding a rain garden or decreasing the percentage of lawn. Ask the class to suggest what changes to make and to predict the impacts before you calculate the changes. Click the “view comparison” button on the chart to see how the improvements impact the runoff.
7. Repeat this exercise with different properties if time allows. If class members bring information on their properties, try comparing them to each other.

Part 2 - National Tree Benefit Calculator

This tool will allow you to calculate the ecosystem service value of a single tree.

Leader Instructions

1. Before class, gather information about a specific tree to examine. It could be a tree at your home, or a tree outside where the class meets. You may ask the class to bring this information for a tree on their own properties with them to class as well. You will need to know the zip code of the property, the species of the tree, the diameter of the tree in inches, and the land-use type of the property.
2. Go to <http://treebenefits.com>. Enter your zip code on the right-hand side of the page, and click “submit.” Then enter the information about the specific tree you have selected in the spaces provided on the left-hand side of the page. The results page will show tabs for the overall benefits of the tree, and then, in different tabs, the benefits broken down into stormwater, property value, energy, air quality, and carbon dioxide. The model will also provide a dollar value for the annual ecosystem service benefits of the tree.

Part 3 – i-Tree Design

This tool will allow you to investigate the best species of tree to plant and where to plant it in order to maximize ecosystem service benefits for a developed property.

Leader Instructions

1. Before class, gather information about a specific property to examine. It could be your home, the place where the class meets, or a student’s home. You will need to know the street address of the property.
2. Go to <https://www.itreetools.org/design.php>. On the right-hand side of the page, enter the street address of the property and click “go.” Then follow the instructions on the left-hand side of the page to outline any heated or air-conditioned areas on the property. Next, ask the class

what type of tree they would like to try planting. Under “Place Trees”, enter information about a hypothetical tree to plant and place the tree on the map, soliciting the information from the class. Note that once you enter the tree species and size, the map will show you the more desirable areas for planting that tree. You can also click the “model crown growth” button to show how the tree will grow over time.

3. Lastly, click the “estimate benefits” link. It will take you to a new page similar to the results from the National Tree Benefit Calculator.

Funding for the development of this Virginia Master Naturalist Basic Training module was provided by the Virginia Department of Forestry through an Urban and Community Forestry grant.



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