

NORTHGATE ELEMENTARY

Teacher Guide

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How to Use This Guide

This guide supports the Community Waters Science Unit Teacher Manual with information, maps, and images specific to your school and neighborhood. It is written for teachers; its goal is to provide a better understanding of what is happening with stormwater in and around your school. The points of interest and walking field trip route are suggestions and should be adapted as desired.

If you have any questions about these maps, accompanying lessons, or stormwater around your school, contact IslandWood staff at communitywaters@IslandWood.org.



Stormwater in the Schoolyard– Lesson 3

This map and points of interest (photos and info) can be used to guide your class' exploration of the schoolyard. You will find the student worksheet for this lesson following the teacher guide version. Please use the extra space on the pages to add your own notes and questions! ☺



** Areas highlighted in yellow were inaccessible to IslandWood Staff at the time of scouting. Explore these areas with students to find more stormwater infrastructure! **



A. Slope

Stormwater that can't absorb into the ground runs off it. The slope of the ground affects where this water flows and how fast. Consider the slope and surfaces of this area: where will the water end up? What kind of ground surface is on the slope (grass, bushes, dirt, gravel, concrete?) How do these surfaces and vegetation affect the stormwater runoff here? How does it compare with the other types of soil that you have seen in other places on the school grounds.

**B. Drain**

Storm Drains move water into underground pipes to take it somewhere else. Anything that gets carried into the drain may end up in a local stream, lake, or Puget Sound. Why do you think the drain was built in this location? Where does water come from that goes into this drain? Why might it have been placed in this place? Is the drain working properly? What is in the drain? Why might this drain be here even though it's surrounded by pervious surface (lawn)? Is this drain covered by anything (leaves, trash)?

**C. Downspouts**

Downspouts drain into the ground near buildings and can be attached directly to the building's sewer or stormwater pipes. Some go to locations where the water can soak in while others drain to the street or sewer systems. These downspouts collect water from the roof, and send the stormwater into the ground. Can students find these themselves? Where do you think the water might go? Where else can you find downspouts?

**D. Mulch**

Woodchips also offer a good comparison of permeability. Do woodchips help with stormwater problems or not? (Think about how well stormwater will absorb compared to pavement, but also consider how the woodchips might get washed into the storm drain).



E. Downspouts

How does this downspout differ than the one you previously visited? Where would water go? Is the surface pervious or impervious?



F. Field

Fields capture more stormwater than pavement but less water than gardens or long grass. Who uses it and what for? How well does water soak into this field?

Mapping Your Schoolyard – Northgate Name: _____ Date: _____



Include on your map:

- Symbols from the Key including flow of water, surfaces, and storm drains.
- Partially pervious surfaces can be shown with less dots.
- Label locations of litter, pollution and places where puddles form.
- Sketch any specific **stormwater problems** you see or are aware of.
- Sketch larger plants and bushes.

Map Key



Direction of
water flow



Pervious
Surface



Impervious
Surface



Storm
Drain

Add your own symbol here!

Local Stormwater Systems – Lesson 5

Student Maps

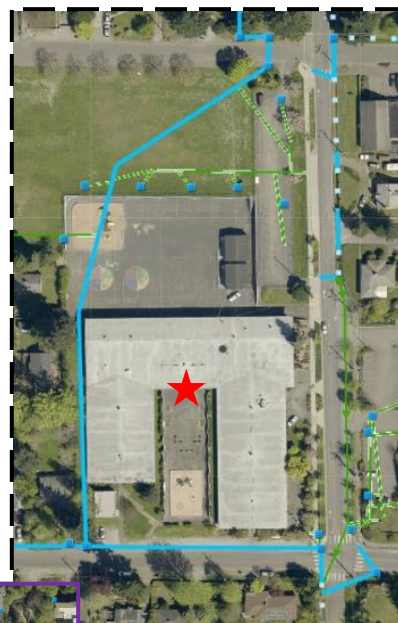
Color maps have been created for use with your students (provided and/or available on communitywaters.org). We suggest students work through them in the following order:

1. Northgate Elementary Storm Drains Map – This map helps students see that the storm drains around their school connect to stormwater pipes.
2. Northgate Neighborhood Water Pipes Map – Students can follow the path of the stormwater pipes and ditches to find out that it drains into Thornton Creek.
3. Seattle Map – This map poses the larger question of where stormwater goes once it enters Lake Washington via Thornton Creek.

Teacher Overview

What happens with the Stormwater Pipes around your school?

- The storm drains (blue squares) at your school empty into the stormwater pipes (green lines with inset arrows) that empty into ditches (light blue lines and dashes) heading south from your school property.
- These ditches drain into stormwater pipes under the I-5 which carry the stormwater south until it is released into Thornton Creek near Northgate Mall. Here, it passes through the Thornton Creek Water Quality Channel which is a modified bioswale designed to slow down and filter the stormwater.



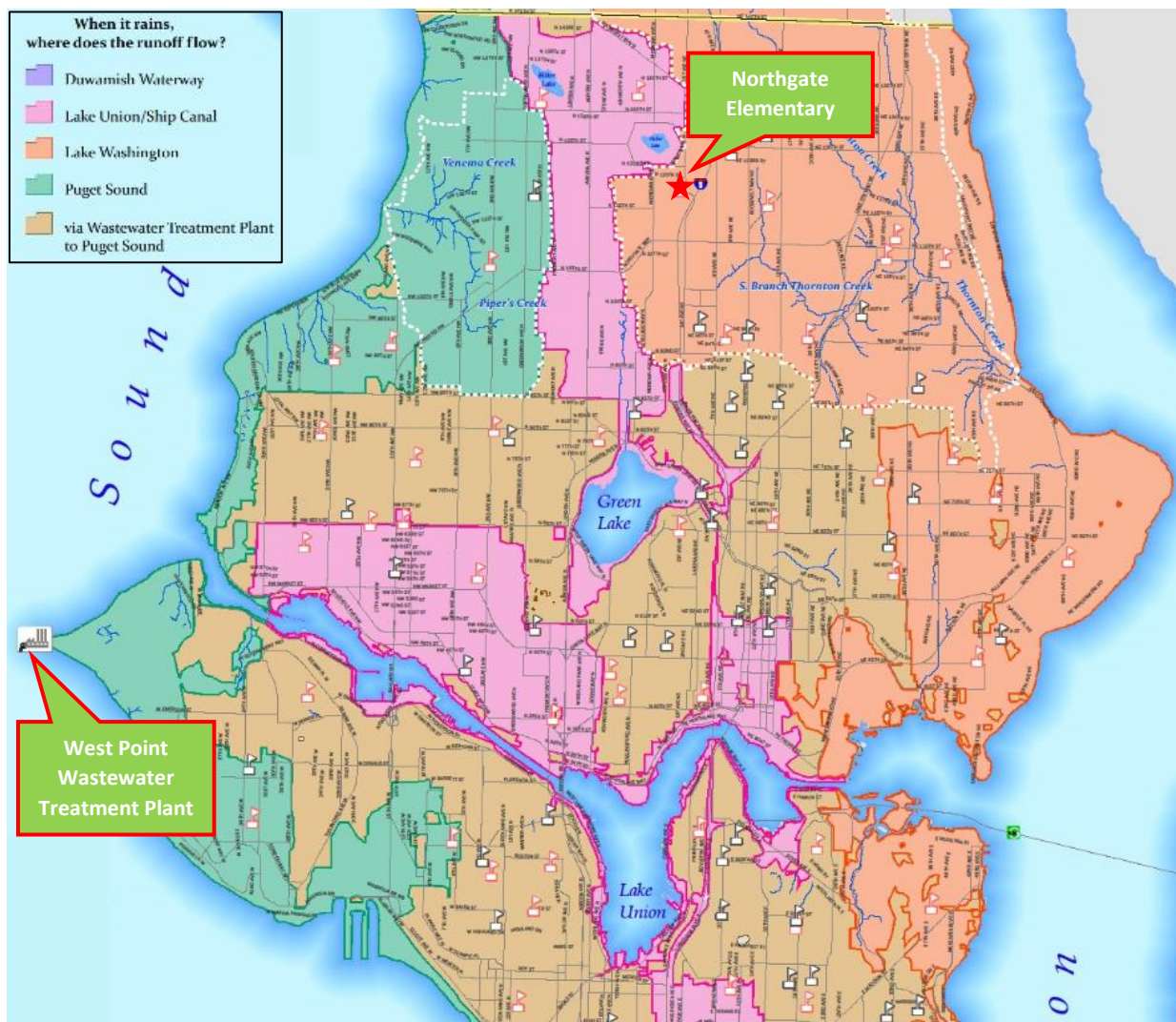
Quick Summary:

Your school's stormwater travels through stormwater pipes and ditches into Lake Washington and from there into Puget Sound.

Use Video Option A (Effects of Urbanization on Stream Ecosystems).

Where does your stormwater runoff end up?

- Thornton Creek eventually makes its way into Lake Washington. This water eventually travels through the Montlake Cut into Lake Union, then through the Chittenden Locks before entering Puget Sound.

Stormwater Runoff Destination Map

Video: Since the stormwater from your school ends up in Thornton Creek, we suggest watching the "Effects of Urbanization on Stream Ecosystems" video (OPTION A) during Lesson 5. Watch from 0:00 to 2:57. You can find this video linked on [communitywaters.org](https://www.communitywaters.org) or at <https://www.youtube.com/watch?v=BYwZiiORYG8>

Please Note: The pipes information provided here is our best estimate of the stormwater flow in your community based on the information we have currently. If you encounter more information in the course of your investigation please let us know so we can update future versions of this document.

Stormwater in Our Community – Lesson 6

Please use this map and points of interest as suggestions for your walking field trip, recognizing there may be other things of importance to note in other areas. It may be useful to bring the stormwater pipes map with you for reference. Questions posed are intended to be posed to students as desired.



Suggested Route: Walk along 1st Ave NE towards N 117th St, take a LEFT on N 117th St, take a LEFT on Corliss Ave N, take a left on N 120th St, take a left on 1st Ave NE and head back to school

** Caution there are no established sidewalks on N 117th St, Corliss Ave N, and N 120th St. There is gravel to walk on along this path. **

Points of Interest**A. Gravel**

Gravel will soak in more water than concrete but less than grass especially after compaction. How does this surface differ than others you have investigated?

**B. Downspout/Gutter**

Some downspouts drain into the ground near houses, while others are attached directly to the buildings sewer or stormwater pipes. Some go to locations where the water can soak in while others drain to the street or sewer systems. These downspouts collect water from this roof, and send the stormwater into the ground. Can students find these themselves? Where do you think the water might go? Where else can you find downspouts? Why do you think this drain is shaped the way it is?

**C. Ditch**

Where does/would water come from that enters this drain? How about the ditch? Are they connected?



D. Rain Barrel

Rain barrels collect water that flows off the roof of a building. Do they know if it is working or how it could collect more water? How are these rain barrels helping with stormwater? Where do they collect water from? What kind of building is it attached to? Who might have put it there? Is there anything that directs water into them, or do they simply catch the water that falls on them? Where does the water they collect go? Can you find another rain barrel on this walk?



E. Rain Garden

Rain gardens have a shallow depression to hold water while it soaks in and provides water to the plants in the garden. Rain gardens can slow, filter and absorb runoff. What do you notice about the garden? What happens to water when it goes into the garden? Have students notice where water can enter the rain garden and what happens if it fills up. What types of plants are living here, and how do they compare to the kinds of plants on the green roof? Why would they be different?



F. Garden

How do the gardens help with stormwater, or not? What would be different if they were not there? Consider that vegetation slows stormwater by helping it soak into the ground and holding soil in place with its roots. However, anything that is put in the garden or on the plants may be washed off—including chemicals or fertilizers, if they are used.