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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.
Mapping 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!

A. Slopes and terraces:
Consider where the water goes in this part of the schoolyard. What do you see that slows down or speeds up the stormwater runoff here? What would be different if the land were flatter? or there were fewer plants? or more permeable surfaces?
B. Rain barrels:
How are these rain barrels helping with stormwater? Where do they collect water from? (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? (How is it used?)
Is there something that could be done to make them catch more water?

C. Garden:
Does this garden help with stormwater runoff or make it worse? Why or why not?
Hint: 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. Presumably, school gardens have few or no chemicals.

D. Downspouts:
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?
E. Rain Garden:
Check out the rain garden right on your campus!
How is it different from the other gardens you have?
Where does it collect runoff from? Where would that runoff go if this garden wasn’t here?
Does it look healthy? Can you tell if it’s working?

F. Storm drains: *(Marked by red boxes)*
There are many storm drains on the school grounds. They are marked on your map in small red squares.
Of particular interest might be the two labeled with the letter F: The first is next to one of the portable buildings. It had rings of dirt around it that suggested it might have been a puddle at one point. Does this drain become flooded?
Also there is a drain at the edge of the covered area, in the concrete floor. This is an interesting spot for a drain—Why do you think this one was placed here?
Mapping Your Schoolyard – Montlake

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.

Map Key

- Direction of water flow
- Pervious Surface
- Impervious Surface
- Storm Drain

Add your own symbol here!
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. Montlake Elementary Storm Drains Map – This map helps students see that the storm drains connect to the combined stormwater and wastewater pipes.
2. Montlake Neighborhood Water Pipes Map – We suggest focusing on following the combined pipes on this map to the red treatment plant pipe. You can also use this map to distinguish areas where storm drains connect to stormwater only pipes (green) that empty directly into the lake.
3. Treatment Plant Pipes and Overflows Map – This map shows where the combined stormwater and wastewater ends up and places it could end up overflowing along the way.

Teacher Overview

What happens with the Stormwater Pipes around your school?

- The storm drains (blue dots) around your school property flow into the same pipes as your wastewater (yellow leading to orange lines).
- This is true for most of the Montlake area except for some stormwater only pipes near Montlake Park and the Arboretum (green lines on neighborhood map).

Where does your stormwater runoff end up?

- The stormwater only pipes in your neighborhood empty directly into Lake Washington. From there the water flows into Lake Union before passing through the Chittenden Locks and into Puget Sound. This isn’t great, but it means that water doesn’t contribute to the combined overflows described below.
- The combined wastewater and stormwater pipes (orange lines) flow east and west from your school but all end up draining into a large treatment plant pipe that flows north along 24th Ave East and East Montlake Place.
- Water and waste in the treatment plant pipes is pumped to West Point Sewage Treatment Plant to be treated. However, in an extreme storm event, there can be too much stormwater in the system resulting in combined sewer overflows (yellow circles).
- The map on the next page shows where the runoff from other parts of the city ends up.

Quick Summary:

Your school’s stormwater goes into combined wastewater-stormwater pipes which can cause Combined Sewer Overflows.

Use Video Option B (Drained Urban Stormwater Pollution).

Video: Since the stormwater from your school could end up in Portage Bay we suggest watching the “Drained: Urban Stormwater Pollution” video (OPTION B) from 0:00 to 2:11 during Lesson 5. Point out to your students that the CSO during a big storm would have everything described, PLUS everything from the sewers (including human waste). You can find this video linked on communitywaters.org or at https://vimeo.com/51603152.

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.
Lesson 5: Stormwater Runoff Destination Map

When it rains, where does the runoff flow?
- Duwamish Waterway
- Lake Union/Ship Canal
- Lake Washington
- Puget Sound
- via Wastewater Treatment Plant to Puget Sound
- Wastewater Treatment Plant
- Montlake Elementary
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:** Exit school to from the side gate along Calhoun Street, if possible. Turn left and walk downhill, crossing 20th Ave E. Continue to 19th Ave E, cross the street and walk a short distance down the path, just to where you can view the park and ball field. Return to 19th Ave E, turning right to travel south along the block. Turn left at E McGraw Street to return to school.

**If this route seems too long, you can also walk around the school block (enter and exit through the front door), noting the storm drains, sloped ground, large trees, and yard features of the houses along Calhoun, 20th, E McGraw, and 22nd Ave E.
A. Large trees, storm drain:
How do trees influence stormwater? Do you think these trees help with stormwater issues or not? What would be different if they were not there? How else do they affect the neighborhood?

Also keep an eye out for storm drains around the neighborhood. Where does the water that enters them come from? What else might be going in them besides water? Where do you think they send the water?

B. Sewer drain:
This drain lid is for the sewer. How does sewer water differ from stormwater? Where does each system go?
*For the record, this neighborhood has a combined or at least partially combined sewer system (as of 2009), which means that the stormwater and sewer water both go into the same pipes and are directed to a wastewater treatment plant. In a large event, some of this stream will overflow into the nearby waterways.

C. Terraced yard:
Notice the structure of this yard. How do you think stormwater moves through this yard? Does it speed up or slow down stormwater? Why or why not?
D. View from top of trail:
From this point, one can see the park and ballfield below and possibly out to Portage Bay. This can be a great opportunity to visualize how stormwater would move over a landscape on a large scale. Where does water flow as it leaves the Montlake school neighborhood? Who or what might be impacted by stormwater down the hill?

If it helps, you can remind students of the models they made in class. How did the water move through the model? What is similar about the model and this landscape? What is different?

E. Gardens and vegetated rock walls:
Compare some of the different yards that you have seen. How do they help with stormwater or not? Do you think the gardens and rock walls along this street help to slow and sink stormwater?

F. Storm drain:
Here’s one more to spot on the way back! It’s located at E. McGraw St and 20th Ave.