What is a Watershed?

Duration : 1 h

Audience : 10 to 12 years

Create your own watershed

Create an area, change the topography or features and observe the impacts on the watershed.

Abrinord
OBV de la rivière du Nord

Objectives

Understand the principle of watersheds, how they are formed and what characterizes them.

- *Identify the role of certain ecosystems.*
- *Identify the potential causes of certain water-related problems.*

Required material :

**It is possible to borrow Abrinord's material.*

- *Small kid pool or big plastic bin*
- *Waterproof tarp, large bag or plastic tablecloth*
- *Large pots (yogurt containers, flower pots, buckets, etc.)*
- *Watering can with sprinkler head*
- *Water*
- *Water-based paint*

For the different habitats, at least three of the following :

- *Sphagnum moss or very absorbent sponges*
- *Scouring pad, carpet or fake grass*
- *Brown paper*
- *Sand or soil*
- *Plastic or wooden blocks*

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Course of the activity

Introduction (10 min)

Introduce the following basic concepts :

What is a watershed ?

A watershed is the entire territory that feeds a river with water. All the water in this territory flows to a single point called the outlet. It is delimited by natural boundaries, such as mountain ridges, which determine the watershed and the direction of runoff. Everything that happens within the watershed territory can have an impact on water as a resource.

What watershed are we in ?

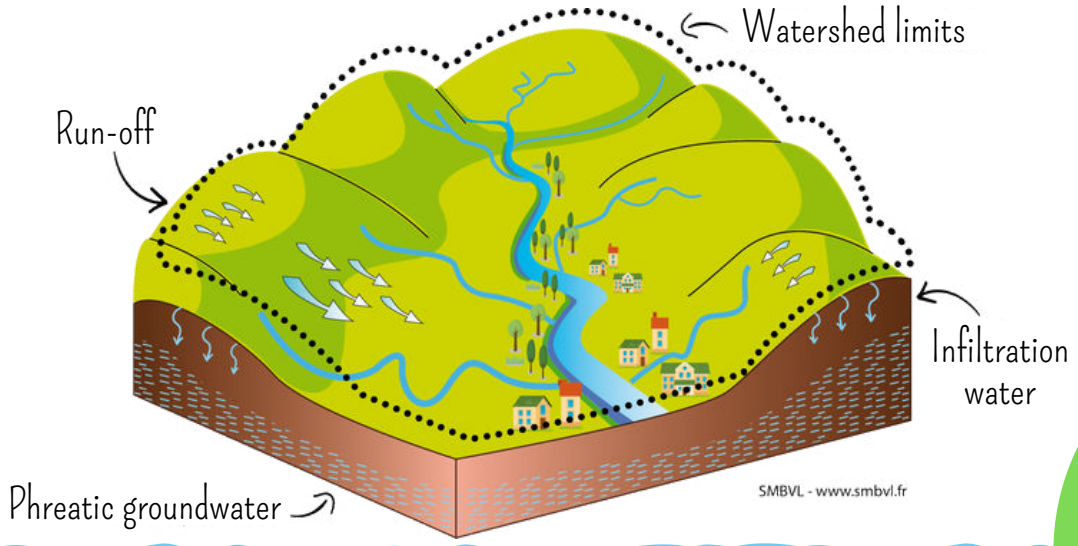
Guiding questions: What river is nearby? Which river flows through the city? What is the largest river in Quebec? The river flows into which ocean?

*Answer: *Watershed to be identified by school → North River watershed → Ottawa River watershed → St. Lawrence River watershed → Atlantic Ocean watershed*

Differentiating upstream and downstream

Upstream is where the water comes from; what's before it. The upstream is up in the mountains.

Downstream is where the water goes; what's after. The downstream is down in the valleys.



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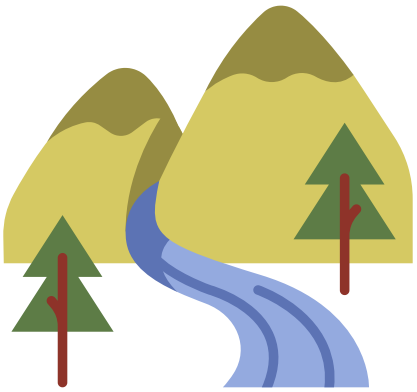
Course of the activity

Creating a watershed (10 min)

1. In the pool or directly on the ground if outside, place pots and containers upside down to create mountains.
2. Spread the tarp or plastic bag over the pots to make the territory's ground. There must be several "mountains" and "valleys", in order to create the "rivers". Careful! Make sure the entire tarp is in the pool to avoid any spills.
3. Arrange the different materials representing the types of environments. You can create an area with natural (absorbing) elements and an area with anthropogenic (less absorbing) elements, in order to compare.

Here is what the materials represent:

- Sphagnum moss or sponge → Wetland: retains a large quantity of water, reduces the risk of flooding, filters contaminants, allows the sedimentation of soil and sand.
- Scrubbing pad or fake grass → Lawn: absorbs some water, but allows a lot of runoff, retains some contaminants, soil and sand.
- Brown paper → Bare soil: absorbs some water, but less than the lawn, does not retain contaminants, soil and sand.
- Sand or soil → Soil particle: easily moved by water.
- Water-based paint → Pollutant: dissolves in water and moves with the current.
- Plastic or wood blocks → House: sensitive to flooding



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Course of the activity

Bringing life to the watershed (20 min)

1. Using the watering can, gently pour water over the model and allow students to make their observations.
   - Locate the streams.
   - Which ones would be the main streams? (Larger streams)
   - Are there several watersheds, i.e. streams that never meet?
   - Does the water flow faster or slower on different slopes?
   - Are there places that form lakes? Why?

2. Have fun changing the watershed and its surroundings!
   - Collect water from the bottom of the pool and put it back into the watering can to reduce water consumption during the activity.
   - Using the various materials, add, remove, move or replace permeable (non-absorbent) and impermeable (absorbent) surfaces. Pour water again. *Wring the water out of the materials between each scenario. What are the observations?
   - Wring out the materials and compare their water absorption. Which environments absorbed the most water? -
   - Try the scenarios on the next page.

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Course of the activity

Bringing life to the watershed (20 min)

Scenarios

Flooding :

Distribute the blocks (houses) throughout the watershed, making sure there are some downstream and on the edge of the streams. Stick the houses with adhesive (sticky tack). Gently pour the water with the watering can.

- If you remove all the wetlands, are the houses downstream flooded?

Erosion :

Sprinkle sand or soil over the entire watershed. Gently pour the water with the watering can.

- What can you observe?

- The sand and soil is washed away by the water. Where do they accumulate?

Pollution :

Add a few drops of paint (pollution source) to 1 or 2 locations upstream of the watersheds and observe. Gently pour the water with the watering can.

- Although the pollution is made upstream, does it travel downstream?

- Does it go everywhere in the watershed?

- Are there any types of environment that help reduce pollution?

**At the end of the activity, collect the water to water the plants or grass outside. Do not reuse water for plants if you have put paint in it, as this could be harmful to them.*

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