

*Lesson 5—Week 5—Site Runoff Surveys*

LESSON OVERVIEW

Students will work in small groups to survey sites in their neighborhood, determining the percentage of each site that contributes to storm water runoff and the percentage that encourages water infiltration.

NOTE: As written, this activity would require a Tablet/Smart Phone with the ArcGIS App (this App is free, and you will be using very basic features).

LEARNING OBJECTIVES

The student will be able to:

- describe process for site survey.
- collect and analyze site data.
- using prior knowledge, discuss why they believe runoff is potentially a problem.

SUPPLIES

- measuring tape
- notebooks and pencil
- iPad with Google Earth (optional)

LESSON

1. Divide students into groups. Each group will select a different kind of site in the neighborhood to survey: business/commercial property, community center/church,

residential property, or a small public park/recreation area. (If possible, having adult volunteers to help with this activity is ideal. If not, make sure the sites are within easy walking distance, so you can check in with all the groups.) Ask for permission to be on properties, if they are private. Ideally you will have different types of properties assigned within the class, for comparison.

2. Discuss the kinds of features students might find at sites: sidewalks, grass, gardens, pavement, buildings, etc. Using Arc-GIS App measurement tool, students will collect data to determine:

Total site area: \_\_\_\_\_

Building area: \_\_\_\_\_

impervious (parking & sidewalk) area: \_\_\_\_\_

pervious (gardens and grass) area: \_\_\_\_\_

Then convert their data to percentages:

% building \_\_\_\_\_

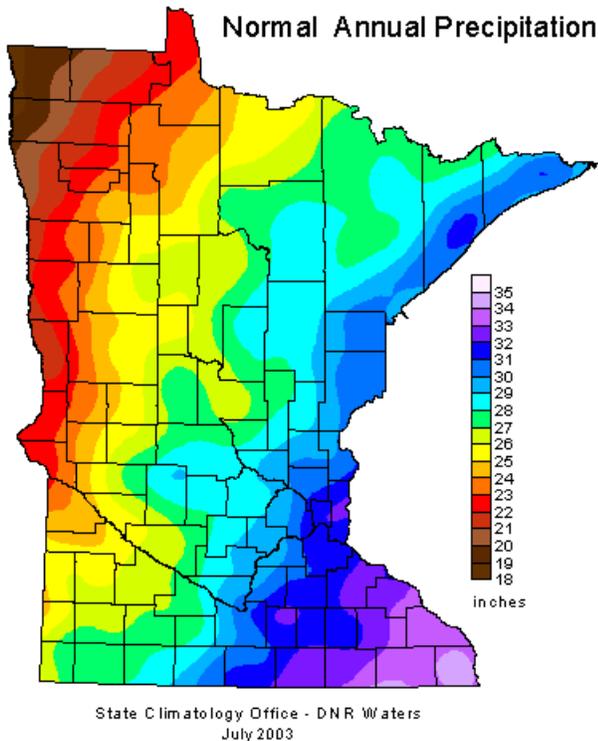
% impervious (parking & sidewalk) \_\_\_\_\_

% pervious (gardens and grass) \_\_\_\_\_

(Liebl, 2007)

1. Use the Arc-GIS App to determine the topography of the site. Does the site feature hills or depressions or is it relatively flat?
2. Making sense of their data:

Using the data they collected, students can estimate the amount of runoff that would occur on the sites they surveyed. Here's an example:



A one-acre site business site, which is 80% covered with buildings and a parking lot, receives 30 inches of rain each year. That's 2½ acre-feet of precipitation, (equal to about 835,000 gallons of water).

Annual runoff can be estimated as follows:

835,000 gallons

x 80% impervious area

= 668,000 gallons of runoff per year

(Liebl, 2007)

(Map: Minnesota Climatology Working Group, 2003)

4. Students share data and compare the estimated annual runoffs from their various sites and discuss the kinds of features that are desirable and those that should be avoided on various kinds of properties.

### OPTIONAL—GOOGLE MAPS

Working together, class puts sites they surveyed on their Google Map