

Site Overview and Sample Collection Lab

PART I

During this lab, you will be introduced to the various sites across Fredericton that we will be visiting next week. You will be broken up into groups for field data collection and will not get a chance to visit all of the sites. This lab will give you the tools to find out more about each site.

1.1 GIS WATERSHED ANALYSIS

In preparation for site analysis, you will be conducting a watershed delineation exercise. The purpose is to find the total area of the watershed for each of the sites. Upstream activity affects the overall quality of each site.

To do this we will be looking at creating the watershed boundary for the woodlot sample site.

1. Fill the DEM (this allows water to continually flow across the landscape).
2. Using the 4 ha Fredericton DEM create a flow direction raster file.
3. Apply the Flow Accumulation, to see if the sample points line up with flows (if needed).
4. Using the Flow Direction file and the known site plots, use the watershed tool to create the delineated watersheds for each point.

1.2 RESEARCH

Each student will be given a site to research for 30-45 minutes. Dig up as much information about that site as you can:

- Where it is
- What is around it (residential, commercial, vegetation, water type, etc...)
- Prediction of water quality (support your prediction with research)

You will then present your site to the class.

1.3 IN LAB WRITE-UP

After the presentations, you will need to create a short write-up to be passed in at the end of lab. Your write-up will include:

- 1 overview map of Fredericton, showcasing all of the sites
- 2-3 maps specific to your assigned site
- Minimum of 250 words that describes the site, including your hypothesis for overall site/water quality (including any research).

This write-up will be graded and the mark included as part of your next report (10%). It is done to help you make sure your maps are properly formatted and you are on the right track for the next Lab. Maps must be properly formatted.

Email your in-lab write up to jones.mfn@gmail.com by the end of the lab session.

PART II

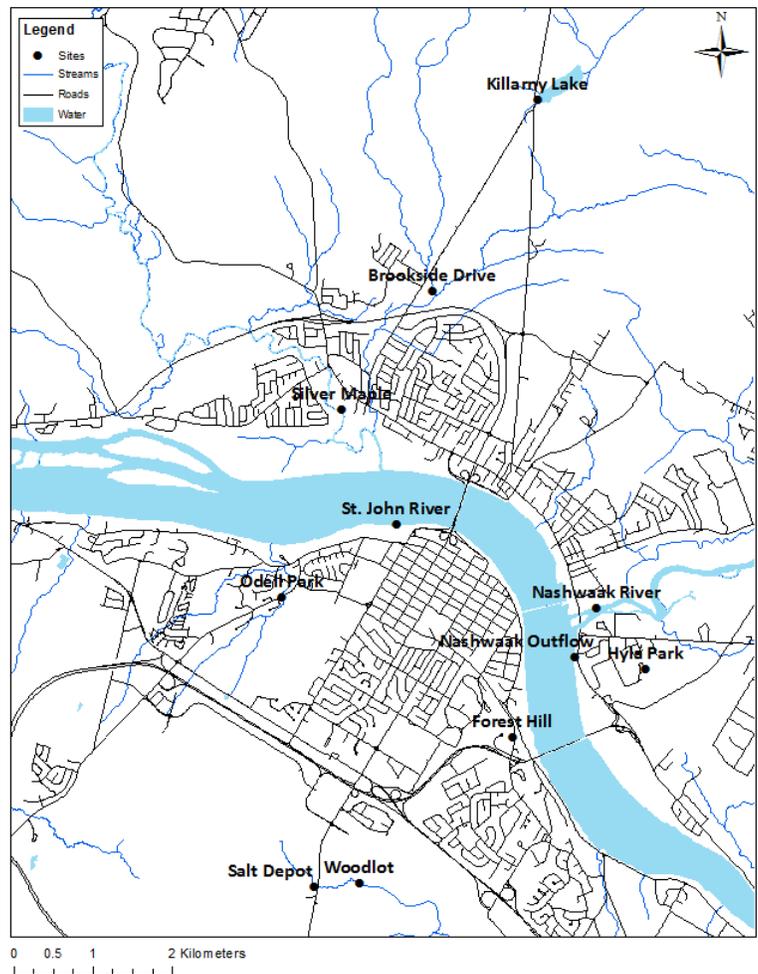
In this lab you will be collecting the soil and water data from 11 different sites across Fredericton. This lab will be the basis of the next few labs, building on what you'll find in the field.

Equipment and Supplies

- Sterile Whirl-Pak® bags for soil
- Plastic containers for water and snow
- Plastic cup for snow density
- Sharpie marker

Sites

Saint John River South Side
Killarney Lake
Silver Maple Stand
Brookside Drive
Nashwaak River
Nashwaak Outflow
Woodlot (Corbett Brook)
Odell Park Outflow
Forest Hill
Hyla Park (Nature Reserve)
Salt Depot



Procedures

At each site collect 3 soil/stream sediment in bags, 3 snow samples in large plastic bottles, 3 water samples in medium plastics bottles, and 3 snow density sample using the plastic cups. Take pictures of the site, clearly label the bags and jars with the date, location, and the content type. Return the samples to the freezer in the basement of the NF building.

Report Outline

The purpose of this lab is to compare all of the study sites and predict/hypothesize their water quality. In your write-up, you can group the sites by site type and predict any trends that you think will be found (i.e. quality trends by soil type, by location to pollutants, etc...). In your introduction, introduce the sites, giving a brief overview of each location, including your overall objective of the lab. You should include a section called Site Locations and talk about all of the sites in detail, with maps and pictures. Methods should include an overview of what was collected, and how it was collected. There is no Results section in this lab since there is no data. Your discussion section is where you discuss your predictions of site quality and overall trends. This section should include research and references to support your hypothesis. Also, is there anything you would do differently in the data collection? Enhance data collection reliability? Conclude your report with stated objectives and the overall lesson learnt.

Report worth:

*Title

Introduction - 20

Site Locations - 15

Methods - 15

Discussion - 30

Conclusion - 5

*References

*Appendix

**Title, References, Appendix together: 5*

GIS Lab - 10

Notes: You need a title page with a title that is descriptive and creative. Make sure to have appropriate references. We discourage the use of web based references (i.e. Wiki). Utilize the library and the online archives to find actual scientific references and books. Make sure to have a properly formatted list of references. Appendices should each have a title. Number your pages, and remember that page 1 starts with your writing, not with the table of contents (if you chose to add one). This report is marked from a 3rd year university level, therefore be sure to write and format appropriately.

Report Marking Guide - Field Data Collection Lab

Introduction (20)

- Did they introduce their lab with important of water quality? A bit of research to back up their intro?
- Did they introduce a general overview of Fredericton sites and a brief mention of the data collection?
- Did they state the objective of the report?

Site Locations (15)

- Did they introduce the sites that they visited across Fredericton? A brief description of each site (urban/rural, forested/non-forested, etc...)?
- Did they state their hypothesis for each site? What is their predicted site quality at each location?
- Did they include an overall map of Fredericton with the locations?
- Did they include any site specific pictures and maps included to support their intro of each site?

Methods (15)

- When and how where the field samples collected? What tools were used to collect samples?
- Did they include any pictures of the sampling gear? Pictures of methods in the field?
- Did they keep the writing in the proper tense? No first person.

Discussion (30)

- Did they go over any trends found and explain them with research to support their hypothesis? (i.e. are all forested sites similar? Would you think they would be the same? If not, why?)
- Did they suggest ways to enhance data collection reliability? How would they make the lab better? (Sampling? Procedure? Human errors?)
- Why is knowing about water quality in snow/soil/water important, especially in watershed management?

Conclusion (5)

- What was learned from collecting data at each site? Urban to rural? General overall trends found? General hypothesis made?

Title, Appendix & References (5)

- Is the title creative and informative? Does it specifically state what will be looked at in the report?
- Is the bibliography formatted properly? (Alphabetical order, APA, consistent format) Are all of the reference academic? (I.e. no URL/wiki references)
- Is the appendix formatted properly? (I.e. proper titles for each appendix) If necessary, data should be in appendix if it's too large or complex for the body of the report.
- Is the paper grammatically correct? Does it flow well? Proper paragraph and sentences? Spelling?

GIS Formatting Lab (10)

- Did they hand in a report with minimum 250 words about their given site?
- Did they provide the required maps? (1 overall map, 2-3 specific maps?)
- Was their site well research/defined?