Lab Reports

• Typed
• Full, grammatically correct sentences!
Lab Report

TO: Rachel McDaniel
FROM:
DATE: 9/25/14
SUBJECT: Watershed Mapping and Delineation
ATTACHMENTS: Watershed Map

Introduction

The purpose of this lab is to delineate the boundaries of a watershed using contour lines from a topographical map. The given location is the Stevens Creek watershed in western North Carolina. By finding the borders of the watershed, the area can then be calculated and with that, the volume of runoff. This is useful to determine the impact of water drainage to the environment downstream.

Theory and Analysis

First, the location of the watershed outlet was found by using the contour map. It is important to know that the watershed must “close,” or have all water flowing through that exit point. A topographical map was used to examine the contour lines to determine drainage and ridgelines of the land. Boundary lines were then drawn around the exterior of the watershed and this outline was then transferred to graphing paper. The area was calculated using the provided scale of 0.2” (the length of one square on the engineering graph paper) equals 400 feet. Using this area and the given runoff/rainfall ratio of 30%, along with the 25 year, 24 hour rainfall of 6 inches, the total amount of runoff was tallied.

Results

The Stevens Creek watershed was found to be approximately 54,720,000 square feet, or 1256.2 acres. With a rainfall total of 6 inches, assuming a runoff rate of 30%, there is 8,208,000 cubic feet of runoff. If 1 cubic foot is equal to 7.4805 gallons, the runoff amounts to 61,400,103.9 gallons, or 188.43 acre-feet. This is a relatively low runoff amount, suggesting that the land around the watershed is not in an urban area and the ground cover is in good condition.

Conclusions

It is important to understand the boundaries of watersheds to know how to properly plan for flood control and determine how the runoff affects the environment downstream. This report analyzed the Stevens Creek watershed including the overall area, and impact rainfall could have with surface runoff.

Attachments
Equations

• Equations should be in theory and analysis, not results

• Calculations should be attached to the lab report (can be hand written)
The runoff was calculated using rainfall depth, the rainfall/runoff ratio, and watershed area (Equation 1).

Runoff = Rainfall x (Rainfall/Runoff ratio) x watershed area (1)
We calculated the runoff from the Stevens Creek watershed to be 8,740,000 cubic feet. This is equal to 200.6 acre-feet or 65,300,000 gallons.
Results and Discussion

<table>
<thead>
<tr>
<th>Runoff</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>8,740,000</td>
<td>Cubic feet</td>
</tr>
<tr>
<td>200.6</td>
<td>Acre-feet</td>
</tr>
<tr>
<td>65,300,000</td>
<td>Gallons</td>
</tr>
</tbody>
</table>

Table 1: Runoff from Stevens Creek located in North Carolina in cubic feet, acre-feet, and gallons

We calculated over 8 million cubic feet of runoff from Stevens Creek (Table 1).
Results and Discussion

• Please do not just list out your results or put your calculations here.
• Again, attach any calculations to the back of your report and refer to it in the text.

“We calculated the area of the watershed by… . See the attached calculations in Appendix 1.”
Attachments

• Again, refer to attachments in the text

“The watershed was delineated using a topographic map (Attachment 2).”

• ALL attachments should have a Heading/Title at the top of the page

“Attachment 1: Area and Runoff Calculations”
Figures/Tables

• ALL figures and tables should have a caption and should be referred to in the text (See previous table example)