

Module: Rainfall-Runoff Analysis Using Real-World High-Frequency Data

Term Project Questions

Rain gage and flow data from the LEWAS system are supplied for a storm event. The details about the site are provided in the PowerPoint slide set. The watershed area is 2,781,440 square meters. Explain your results based on following tasks:

1. Plot the daily discharges, estimate and then subtract a baseflow from the daily flows and estimate the volume of direct runoff, first in cfs-days. Then convert these volumes to acre-inches and finally watershed inches. You should do this for each day of the runoff period as long as streamflow is above the baseflow level. Sum the daily values to find the total direct runoff in watershed inches for the entire flood period. Show sample calculations.
2. Compute runoff to rainfall ratios for each day and for the entire flood period. Note that both rainfall and runoff are expressed in units of inches and therefore are consistent. The ratios tell you what fraction of the rainfall appeared as watershed runoff at the outlet of the drainage system where the stream gage is located. This ratio is also called the runoff coefficient.
3. Write a brief report using the outline below. Comment on your runoff ratios. How can they exceed 1.0? Would you expect the ratio to remain constant throughout the year? What issues contribute to possible errors? Use this outline for your report: 1. Title page 2. Tasks restated in your words 3. Present raw data in concise form, maps, and basic computations 4. Summarize results 5. Conclusions and discussion

Written Report

- Submit electronic copy of the report (in .doc format) by the deadline to the instructor. *Be sure to cite and provide references for all sources including textbook, articles, websites, etc.* Figures from a web site or textbook can only be used if the source is credited. Use complete sentences, check spelling, and avoid using first or second person in technical writing.
- Each group member is expected to contribute equivalent amounts to this effort.

Oral Presentation

- Submit an electronic copy of the presentation slides (in .ppt format)
- Length: 10 minutes per group
- Each group member should contribute equal amount to the entire presentation

Scoring and Evaluation Rubrics

Criteria	Poor 70-79%	Average 80-89%	Good 90-99%	Excellent 100%
Understanding of the project tasks	Missed to answer some of the project questions; attempted some with limited information.	Attempted to answer all questions, but incorrect and serious errors in calculations, analysis steps, unit consideration, etc.	Answer all questions with reasonable solutions steps, calculations, results, and discussion; no serious errors	Provide correct answer to all questions with expected results and solution methods.
Baseflow calculation	Calculation of direct runoff and baseflow are not sufficiently executed; no graphs provided.	Significant error in calculation and estimation of direct runoff and base flow; Poor graphs	There is minor error in Calculation and estimation of direct runoff and base flow; Acceptable plots	No error in Calculation/estimation of direct runoff and baseflow. The results and graph are correct.
Runoff ratio calculation	Not completely or sufficiently conducted the calculation of runoff coefficient for each day and for entire storm	Complete calculation of runoff coefficient but missing days or the storm period or with significant errors	Provided all required calculation of runoff coefficient for each day and for the entire period, with minor errors or information	Calculation of runoff coefficient is correctly conducted for each day and for the storm period. No errors.
Discussion of the questions provided	Not all project questions attempted. Very limited or insufficient discussion is provided in a few sentences.	All project questions are attempted but with very limited answers or justification of why the results may or may not make sense.	All project questions are answered with moderate or sufficient justification.	All project questions are answered sufficiently with additional thoughts and explanation of the question as a whole and personal reflection.
Report preparation overall	Did not follow the format of a report writing, poorly done cover page, table of content; Several errors in spelling and grammar; Incorrect or insufficient figure table captions, in-text citations, references, sentence structures, etc.	Correctly followed the format of a report writing, good attempt with the table of content; Minor or no errors in spelling and grammar; Figures and tables are presented relatively well but with missing in-text citation, captions, references, etc.	Overall prepared a good project report, but with some errors in spellings, grammars, captions, figures, tables, citations, captions, etc.	Excellent project report with no errors but expected contents including proper sub-headings, in-text citation, figure/table captions, references, etc.
Overall presentation skills	The presentation was difficult for the audience to understand; none or poor visual aids, poor dress code, clear presentation, etc.	The presentation was understandable but not clear; poor visual aids, dress code considered, clear articulation in presentation, etc.	The presentation was proficient. The audience could understand the presentation. Good visual aids; clear articulation, etc.	The presentation exceeded expectations. The audience could easily understand the project tasks, methods, and results.