What time of year do floods happen?

USGS Streamflow Data Analysis Instructions

Instructional Video

1. Go to: https://waterwatch.usgs.gov/?id=ww_current
2. Click on your state.
3. Hover over stations (circles) to identify them, and then click on the river closest to your community.
4. Click on the Station Number (the blue hyperlink)
5. In the “Available Data” table, select “Peak Streamflow”
6. In the “Output Formats” section, select “Tab-separated File”
7. A new browser tab should open. Press Control A (to select all), then Control C (to copy).
8. Open a Google Sheet and Name it “Flood Data”
9. In the bottom left-hand corner, click the drop-down arrow on the Sheet 1 tab and rename it “Raw Data”
10. Click in cell A1, press Control V to paste the data
11. Highlight cells A1-A74. Choose: Edit → Delete Rows 1-74. (don’t just delete the values in the rows, you actually have to delete the rows, which will move our desired data to row 1).
12. Select Column A. Choose Data→ Split text to columns
13. Click in Cell A1. Choose Insert→ row above
14. Label cell C1:”Date”
15. Label cell E1: “Peak Streamflow (cfs)”
16. Copy all the data in column E. In the bottom left-hand corner of the screen, click the “+” button to add a new sheet. Change its name from “Sheet2 to “Month”
17. Click in cell A1 and paste the data.

18. Go back to your “Raw Data” sheet and copy all the data in column C. Select your “Month” sheet, click on cell B1 and paste the data.

19. Select Column B.

20. Click Data→ Split text to columns

21. A small window will open near the bottom left of the screen. Next to the word “Separator”, Choose “Custom”, and Type a short dash “-“ which will separate the date into 3 columns.

22. Label cell A1 “Year”, cell B1 “Month”, and cell C1 “Day”

23. Be careful here: Select the whole data set, click Data-->Sort range (the 5th option down). Select “data has header row”, next to “Sort by”, choose “Month”, A→ Z. This will sort by month.

24. In column F1, type “Month”, and in G1, type “Number of Annual Peak Flows”

25. In the new Month column, type the names of all the months that at least one flood has occurred (scroll down the data set to search)

26. Count the number of floods that occurred in each of those months. For example, how many floods have occurred in April, May, June, July….

27. Make sure your total number of floods matches the total number of years on record.

28. Highlight this new data table that you’ve created (Month and Number)

29. Select the “insert chart icon” and then in “Setup” tab of the Chart Editor (on far right), under “Chart type” change the chart type to a bar chart if it’s not one already.

30. In the “Customize” tab of the Chart Editor (on far right), under “Chart and axis titles”, add a title: “Timing of Historic Annual Peak Flows”

31. Change the subtitle of the Graph to “River Name @ Town: Years of Record” Example: San Juan River @ Pagosa Springs, CO: 1911-2019

32. Center both titles

33. In the “Customize” tab of the Chart Editor (on far right), under “Series”, scroll down and check the box next to “Data Labels”

34. In the upper right corner, click the 3 dots, and move the chart to its own sheet. You can change the graph type to a pie chart to see view the data in percentages.

35. Click on the “Month” tab.

36. Select the data in Columns A-D.

37. Be careful here: click Data-->Sort range (the 5th option down). Select “data has header row”, next to “Sort by”, choose “Peak Streamflow”, Z→ A. This step will sort the peak streamflow from highest to lowest.

38. Analyze the top 10 highest flows and the season that they occurred.

Flood Timing Questions

1. What percentage of the annual peak flows happen in May and June? Speculate on what causes these peak flows.

2. What would cause the river to flood in April instead of May or June?

3. What would cause the river to flood in the fall?

4. Which floods are bigger: spring or fall? Hypothesize why.