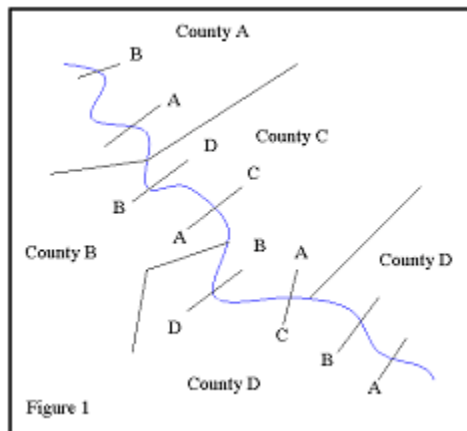


Issue 25: Cross Section Numbering

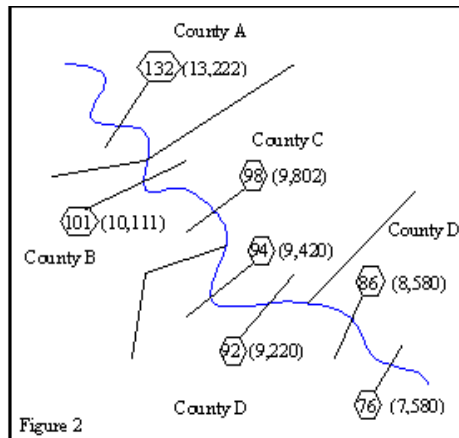
Background

A traditional Flood Insurance Rate Map (FIRM) depicts the location of select cross sections, labeled by a letter, along streams studied by detailed methods. These "lettered" cross sections are necessary to allow the map user to relate flood hazard information shown on the FIRM to Flood Insurance Study (FIS) report components and, if necessary, the effective hydraulic model. The most downstream lettered cross section on a stream within the mapped jurisdiction is typically lettered "A," with subsequent cross sections lettered "B," "C," "D," and so on. If a stream has more than 26 lettered cross sections, the lettering continues with "AA" and "AB" and so on. Cross section lettering is done in the mapped jurisdiction typically on a countywide or community-wide basis. Since the State of North Carolina is preparing a Statewide FIRM with countywide FIS reports, potential conflicts may arise when a detail studied stream crosses or is contiguous with multiple counties. As illustrated in Figure 1, using the traditional lettering convention results in cross sections with multiple and/or conflicting letters, depending on which county is being referenced.



It has been proposed that the cross sections depicted on the new North Carolina Statewide digital FIRM be "numbered cross sections", based on stream stationing, instead of "lettered cross sections." This stationing distance would be in feet, rounded to the nearest hundred and then truncated (e.g., the cross section 15,080 feet upstream of the mouth would be labeled 151). Figure 2 on the next page shows an example of this proposed cross section numbering convention.

North Carolina is studying the flood hazards on a basinwide basis. Because all riverine flooding sources being studied are contained within a single river basin and each basin is assigned to one contractor, cross-section labeling will remain consistent for a particular stream. This labeling method will apply to the Floodway Data Tables (FDTs), which show all labeled cross sections, the distance from the mouth of the stream, and flood elevations. The new labeling will also apply to profiles.



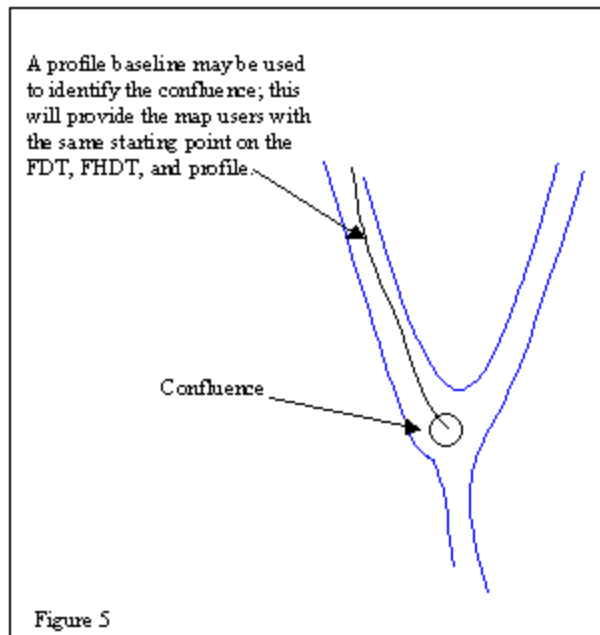
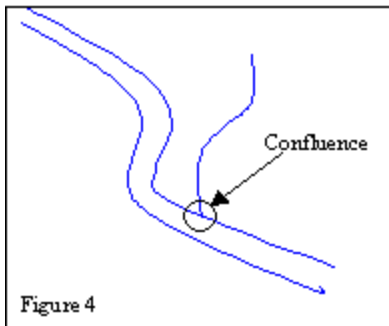
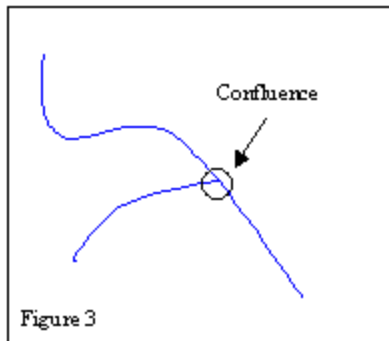
In addition, for most streams, the stationing that was used to develop the effective hydraulic model and the flood profile may disagree with the stream stationing depicted on a different data source, such as that used for the new digital FIRM. We have not determined whether the flood elevations on the effective flood profile should be re-stationed to minimize this discrepancy.

Recommendations

The North Carolina Statewide digital FIRM should use the proposed cross-section numbering convention for all stream reaches newly studied by detailed and limited detailed methods. The floodplains for some streams will be redelineated based on more up-to-date topographic information, rather than restudied. We suggest that the numbered labeling scheme be used for stream reaches that are not restudied, but redelineated; however, the effective lettered labeling scheme may be kept when necessary to save time and money. In addition, where a detailed studied stream crosses multiple counties, it is further suggested that the labeling scheme for a single flooding source remains consistent throughout the State.

The numbering system will typically be referenced to distance in feet above the mouth of the stream, rounded to the nearest hundred and then truncated. These cross-section numbers will be depicted on the FIRM, Flood Hazard Data Tables (FHDTs), FDTs, and profiles. On the FDTs, this change from FEMA's standard will be located in the first column. The second FDT column should still represent the actual distance above the mouth. On the FIRM, stretching of the hexagon, which is also shown within the FIS and on the profiles, used for labeling the cross section is acceptable.

Possible locations at which station labeling can be referenced include the confluence with another stream, a fixed point such as a road crossing, or the State/County boundary. The confluence of two single-line streams is where the two lines intersect, as illustrated in Figure 3. When a single-line stream joins a double-line stream, the confluence should be where the single-line stream intersects one of the lines of the double-line flooding source, as illustrated in Figure 4. However, when two double-line streams join, we recommend using a profile baseline to illustrate the confluence on which the stream stationing is based. For very large flooding sources, their confluence is often difficult to determine. We recommend that the method shown in Figure 5 on the following page be used in the latter situations.



In addition, we suggest that when channelization or natural changes occur to a streambed (thus altering the stationing of the cross sections located upstream of the changes), an equalization standard be established to document these changes in stream length. If information becomes available (either during the later stages of map production or after the FIRM goes effective), FEMA and the State should maintain this information so that a future map revision can fix this discrepancy, if warranted. Therefore, the overall stream distance may be updated after publication of the effective FIRM to account for straightening or meandering of a channel.

Recommendations on re-stationing to develop an updated flood profile are not included in this issue paper.

Discussion Summary

Date Discussed: 07/18/2001
Discussion Attendees: Contractors Meeting

Summary of Discussion

The State's mapping contractors explained that there were no cost considerations for showing lettered versus numbered cross sections. After much discussion the recommendations made in this paper were agreed upon. It was further decided that all mapped cross sections will be labeled with numbers located in a hexagon-shaped box. The hexagon will be standard FEMA size and typically on only one end of the cross section line, unless the SFHA for the stream is on multiple panels. The contractors should also align the labels to read horizontally

Final Guidelines

The North Carolina Statewide digital FIRM should use the cross-section numbering convention for all stream reaches newly studied by detailed and limited detailed methods, as well as for stream reaches that are not restudied; however, the effective lettered labeling scheme may be kept when necessary to save time and money. In addition, where a detailed studied stream crosses multiple counties, the labeling scheme should stay consistent throughout the State.

The numbering system will typically be referenced to distance in feet above the mouth of the stream, rounded to the nearest hundred and then truncated. These cross-section numbers will be depicted on the FIRM, FHDTs, FDTs, and profiles. On the FDTs, this change from FEMA's standard will be located in the first column. The second FDT column should still represent the actual distance above the mouth. On the FIRM, stretching of the hexagon, which is also shown within the FIS and on the profiles, used for labeling the cross section is acceptable.

In addition, when channelization or natural changes occur to a streambed (thus altering the stationing of the cross sections located upstream of the changes), an equalization standard should be established to document these changes in stream length.

Point of Contact

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