

Issue 42: Process for Modeling and Mapping Streams That Enter and Exit the North Carolina State Boundary

Background

The NCFMP flood mapping updates include study streams that intersect the North Carolina State boundary. Traditionally, FEMA FIRMs and hydraulic studies do not extend across jurisdictional boundaries, including City, County, and State limits. This creates the potential for inconsistency between flood studies from one jurisdiction to another. Previously, the NCFMP, in concert with FEMA's requirements, continued studies to the limit of flooding affecting the community (LOFAC) and trimmed mapping products to the State line. In an effort to meet the intent of FEMA's Map Modernization initiative; the NCFMP goals and to maintain consistency and continuity of hydrologic and hydraulic modeling, the NCFMP is considering extending the limits of H&H studies and mapping beyond the North Carolina State boundary.

Issue

Implementation of NCFMP studies and DFIRM mapping across the State boundary will require collection of applicable base data and coordination and sharing of results with a number of counties and municipalities in Virginia, Tennessee, Georgia and South Carolina. Along the Virginia border this will also require coordination with FEMA Region 3.

Currently, the NCFMP has authority to produce DFIRMs within the State boundary. The NCFMP does not have a mechanism for collecting base data for areas outside of North Carolina. The NCFMP has considered producing mapping outside of the State boundary as "best available data", however, FEMA does not have specifications for mapping Special Flood Hazard Areas (SFHAs) that are not intended for flood insurance purposes.

Actions to Date (January 2006)

During contracting of the Roanoke River basin, the NCFMP and its Engineering and Mapping Contractors (EMCs) agreed to extend several study reaches beyond the LOFAC along the VA border. The reaches were extended in one of the three following ways:

- 1) The study was extended 1,000 to 2,500 feet into VA;
- 2) The study was extended to include effects of a major hydraulic feature such as a road;
or
- 3) The study was extended to maintain a continuous model in locations where the study reach exited and returned to NC within a reasonable study length, typically less than one (1) to two (2) miles.

Additionally, to explore the cost and effectiveness of extensions of studies beyond the State boundary, the NCFMP has authorized a limited pilot study along the NC / VA border. Preliminary meetings with the NCFMP, the State of Virginia and FEMA Region 3 have resulted in

North Carolina Cooperating Technical State Mapping Program

an agreement between all parties to proceed with the NCFMP's efforts. The following action items were agreed to during the meetings:

- 1) Virginia will supply base data to the NCFMP.
- 2) The NCFMP will supply draft maps to the State of Virginia, showing both NC and VA Special Flood Hazard Areas (SFHAs) for specific streams that cross the State boundary.
- 3) The NCFMP agreed to "appropriately" label NCFMP studies within the State of Virginia on the maps, as these areas cannot be used for flood insurance purposes within Virginia.
- 4) Virginia will distribute the new maps to local units of government, as needed, for use as best available data.

Recommendations

PILOT STUDY EFFORTS

Roanoke River and the Virginia Border

The NCFMP will require the EMCs to produce DFIRM panels following existing specifications (i.e. trimmed to the State boundary) and to also provide DFIRM panels that including SFHAs mapped within Virginia as a separate deliverables. The NCFMP will use the NC / VA border DFIRMs, base data supplied by VA, and the EMCs mapping within VA to produce maps showing all flooding for the streams within the pilot study area. This data will be supplied to the State of Virginia and FEMA Region 3 after completion.

The following areas have been identified as potential pilot study areas:

- 1) The Dan River on DFIRM Panel 3711508200J in Stokes County;
- 2) The Little Dan River on DFIRM Panel 371159200J in Stokes County; and
- 3) Crooked Creek on DFIRM panels 3711606000J and 3711608000J in Stokes County.

Each of these areas will require base data and effective DFIRM data collection for Patrick County, Virginia, and Crooked Creek DFIRM Panel 3711608000J will require base data and effective DFIRM data collection for Henry County, Virginia.

Each of the three (3) alternatives present a unique view and tie-in data at the NC / VA border, so it is recommended the pilot area be expanded to include each of the three (3) study areas.

Catawba River Basin and the South Carolina Border

The NCFMP has currently developing DFIRMs in Gaston County along the NC / SC border. The State of South Carolina recently published preliminary DFIRMs along the NC / SC border at the Gaston County (NC) and York County (SC) boundary. South Carolina's DFIRM panels have digital base data and a pilot study could easily be implemented at minimal cost on the Gaston / York border.

North Carolina Cooperating Technical State Mapping Program

The following areas have been identified as potential pilot study areas:

- 1) South Fork Crowders Creek Trib 7 on DFIRM Panel 3710452200J; and
- 2) South Fork Crowder Creek and South Fork Crowder Creek Trib 2 on DFIRM Panels 3710354100J and 3710355100J.

The NCFMP should contact the South Carolina Floodplain Mapping Program to coordinate mapping on these reaches. Once agreement is reached, the NCFMP should acquire the digital mapping files from SC and produce the panels per the agreements reached with SC.

Scoping and Contracting

The NCFMP will review study reaches along the State border during scoping and Basin Plan development and modify both to require extensions of studies beyond the LOFAC to the following extents:

- 1) extend 1000 to 2500 feet in to the border state to establish backwater; or
- 2) extend the study to include the effects of a major hydraulic feature such as a road; or
- 3) extend the study to maintain a continuous model in locations where the study reach exit and reenter NC within a reasonable study length, typically less than one (1) to two (2) miles.

The EMC Delivery Order and contract will reflect the study length associated with these extensions. In areas, where the EMC cannot acquire adequate backup or base data, the NCFMP will coordinate with the border state to acquire the needed data.

Mapping

DFIRM panels shall be produced with existing DFRIM specifications, until the point in time that the specifications are modified to allow mapping outside of NC. Until that time, creation of mapping outside of NC should be considered and coordinated on a case-by-case basis.

Coordination

Since this effort includes generation of maps in areas outside of NC's jurisdiction, the approval of the border State and FEMA region shall be obtained prior to mapping efforts. The approval, scope of study and mapping products to be produced will be documented in a Memorandum of Agreement between the bordering States and the FEMA region.

Documentation

Since mapping outside of NC cannot be used for insurance purposes, the NCFMP should develop appropriate labeling of the SFHAs prior to publishing the pilot study maps to avoid confusion with effective FIRMs within the State of Virginia and South Carolina.

The NCFMP will document the procedures and data requirements needed to produce the mapping in border States. Once the pilot study is complete, the NCFMP will develop a

North Carolina Cooperating Technical State Mapping Program

guidance document for future studies and provide this document to FEMA for consideration in the Map Modernization effort.

FUTURE STUDY EFFORTS

During the coordination of the SC pilot study panel, SC expressed interest in petitioning FEMA Region IV to allow the NC / SC border panels to show the SFHAs from NC and SC. While this is a shift in traditional mapping specifications, it would allow for true "seamless" mapping. Expansion of this effort beyond the pilot panel(s) should be considered as SC shares the largest border with NC and has an active mapping program. Timely coordination could allow studies in the Yadkin, Broad, French Broad, Savannah, Little Tennessee, and Hiwassee river basins to be considered for additional pilot study-style mapping or for seamless mapping.

Several obstacles, including FEMA approval and legal issues regarding the State boundary, will need resolution prior to production of seamless border panels. To initiate the venture, NC and SC should enter in an MOA, which documents each State's support of the project and outlines the following:

- 1) Agreement between the States to pursue the joint mapping;
- 2) Agreements for data sharing;
- 3) Responsibility for map production;
- 4) Action plan for ordinance revisions for communities with border panels;
- 5) Outreach strategy; and
- 6) Funding responsibilities.

The guidance document produced as part of the pilot study should be amended and updated as needed for progress with the NC / SC MOA. Efforts beyond the MOA with SC should not be initiated prior to FEMA approval, as FEMA's input will have a wide influence on the scope and breadth of future study limits and agreements with border states.

Discussion Summary

Date Discussed: April 12, 2005
Discussion Attendees: Floodplain Mapping Core Group

Summary of Discussion

Initial Discussion: Issue Paper should be modified to reflect Pilot Study approach.
Discussion: Issue Paper should include text regarding MOAs between States and Regions with the NCFMP and should explore joint issuance between States.

Final Guidelines

Recommendations were accepted.

Points of Contact

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