Guidance for Flood Risk Analysis and Mapping

Combined Coastal and Riverine Floodplain

May 2015

FEMA

Requirements for the Federal Emergency Management Agency (FEMA) Risk Mapping, Assessment, and Planning (Risk MAP) Program are specified separately by statute, regulation, or FEMA policy (primarily the Standards for Flood Risk Analysis and Mapping). This document provides guidance to support the requirements and recommends approaches for effective and efficient implementation. The guidance, context, and other information in this document is not required unless it is codified separately in the aforementioned statute, regulation, or policy. Alternate approaches that comply with all requirements are acceptable.

For more information, please visit the FEMA Guidelines and Standards for Flood Risk Analysis and Mapping webpage (www.fema.gov/guidelines-and-standards-flood-risk-analysis-and-mapping), which presents the policy, related guidance, technical references, and other information about the guidelines and standards development process.

Document History

Affected Section or Subsection	Date	Description
First Publication	May 2015	Initial version of new transformed guidance. The content was derived from the Guidelines and Specifications for Flood Hazard Mapping Partners, Procedure Memoranda, and/or Operating Guidance documents. It has been reorganized and is being published separately from the standards.

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1.0 Combined Coastal and Riverine Floodplain Overview

Outlined in this guidance document is the process that Mapping Partners should follow in areas of combined coastal and riverine flooding. The impacts to the Flood Insurance Rate Map (FIRM) Panel graphics standards are provided in section 2.0. Changes to the Flood Insurance Study (FIS) Report, including Floodway Data Tables and Profiles, are provided in the *FIS Report Technical Reference* and *FIS Report Guidance* documents. A summary of the FIRM Database updates is provided in the *FIRM Database Technical Reference*. For guidance on metadata associated with the Coastal Guidance, please see the metadata section of the *FIRM Database Guidance* document.

2.0 Flood Insurance Rate Map (FIRM) Panels

Combining coastal and riverine flooding on the FIRM Panels should consider: differentiating between the Special Flood Hazard Areas (SFHAs), floodways, and cross sections or nodes. Related Standard IDs (SIDs) with this guidance include 106, 282, 297, 334, 338, 340, 342, and 346.

2.1 Mapping of Combined Coastal and Riverine Floodplain

The coastal floodplain, which includes areas that experience wave effects as well as areas that are at risk of stillwater flooding from storm surge and other coastal processes, are mapped as described in the guidance for coastal flood hazard mapping. Similarly, mapping of riverine flood hazards are also described in their respective guidance documents.

The transition area between coastal and riverine floodplains is often analyzed for the effects of the combined rate of occurrence for coastal and riverine flooding on the base flood elevation (BFE). The coastal floodplain should be mapped with static BFEs in areas subject to storm surge and/or wave effects, and to the farthest upstream location where the combined rate of occurrence results equal the coastal stillwater elevation, rounded to a tenth of a foot. The combined coastal-riverine floodplain is mapped similar to typical riverine floodplain mapping—as Zone AE with BFE lines and/or cross sections. The regulatory elevations for the BFE lines and/or cross sections in the combined coastal-riverine floodplain are based on the results of the combined rate of occurrence analysis.

An “SFHA/Flood Zone Boundary” line should be mapped marking the location of the change from coastal to combined coastal and riverine, or riverine-only, and separating the coastal floodplain with static BFEs from the riverine or combined coastal and riverine Zone AE with BFE lines. The boundary is not labeled on the FIRM, but its location should match the flooding type annotations along the FIS profile. Unless technically unjustified, an effort should be made to map the SFHA/Flood Zone Boundary approximately parallel to neighboring riverine cross sections and BFEs so as to avoid intersecting a cross section or BFE line.

The upstream limit of the combined coastal and riverine section of floodplain is located at the point where the combined rate of occurrence results equal the riverine water surface elevation for the base flood, rounded to a tenth of a foot. A second line should be mapped to mark the upstream limit of the combined coastal and riverine floodplain. This line is a source boundary and should be attributed “Other Boundary.” This line serves to split the Zone AE so that the

flood hazard area polygons can be attributed to differentiate flood types (e.g., “Combined Coastal and Riverine” vs. “Riverine”).

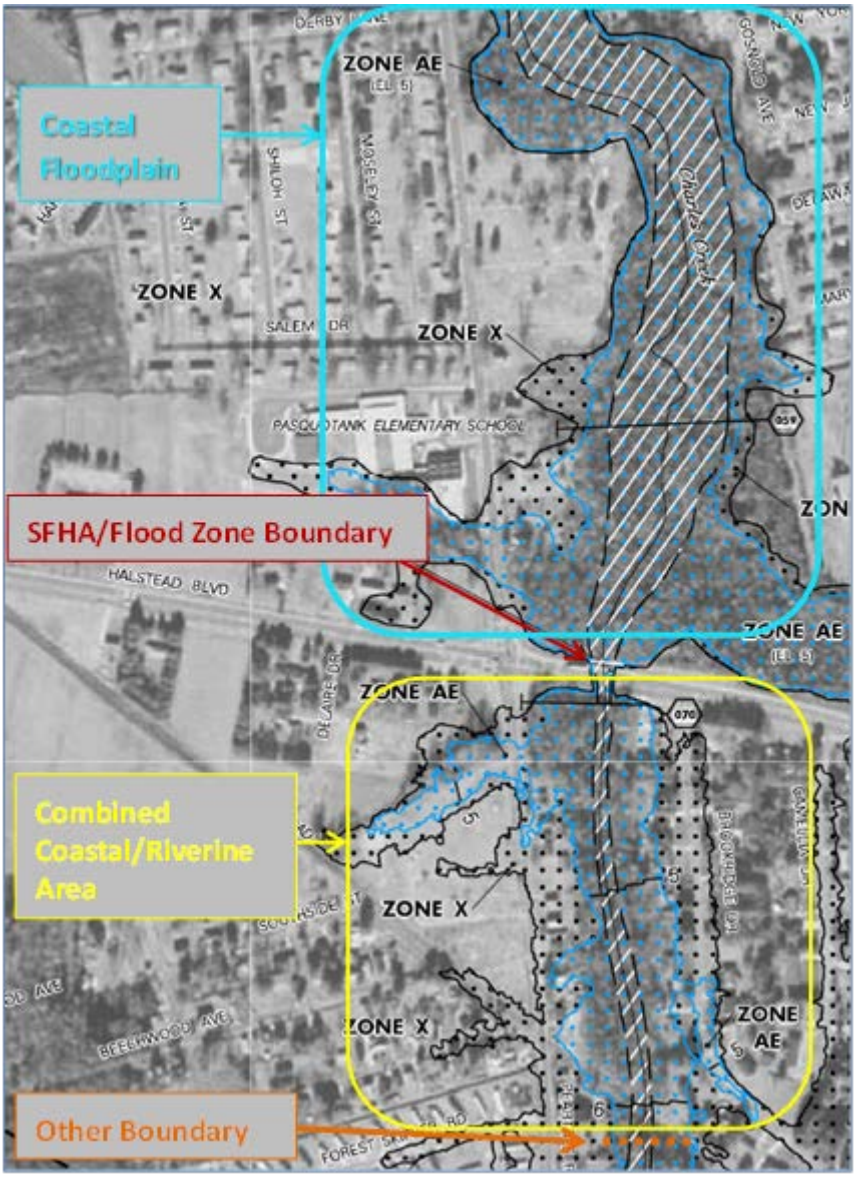

Figure 1: Annotated FIRM showing map features in coastal and combined coastal/riverine floodplains

2.2 Floodways

Previous guidance in FEMA’s Appendix C (pg. 47) states:

Regulatory floodways are not normally delineated in coastal high-hazard areas (i.e., Zones V1–V20, VE, and V). The computation of regulatory floodways on riverine flooding sources in coastal floodplains is based on the base flood discharge and elevations of the riverine flooding source only. The regulatory floodway should be terminated at the boundary of the V1–V30, VE, or V Zone or where the mean high tide exceeds the 1-percent-annual-chance riverine flood elevation, whichever occurs further upstream.

Legacy floodways should be retained in coastal and combined coastal and riverine flood zones upstream of the limit of moderate wave action (LiMWA). Even if the coastal flooding is shown to be the controlling flooding mechanism and the regulatory base flood elevations are based on the coastal water level or a combined rate of occurrence analysis with the coastal elevations, the legacy floodway should be shown on the FIRM upstream of the LiMWA. Floodways should be truncated at the LiMWA so as not to extend downstream of the LiMWA. In areas where the LiMWA is not mapped, the floodway should not be mapped in areas that are designated as the coastal high hazard area (Zone VE), and should therefore be truncated at the Zone AE/Zone VE boundary. If the floodway crosses multiple LiMWAs or alternating VE and AE Zones, the floodway should be retained to the farthest downstream LiMWA (or Zone VE/Zone AE boundary). A "Limit Line" is used to define the limit of the floodway even if the floodway is truncated at the LiMWA.

For ongoing Flood Risk Projects, community coordination should discuss where the floodway will be truncated in areas subject to flooding from both coastal and riverine sources. The guidance above should be followed to determine the farthest downstream that the floodway is mapped. Alternatively, the floodway may be truncated as far upstream as the location where the riverine Water Surface Elevation (WSEL) is 1 foot lower than the stillwater elevation or BFE (whichever is greater) of the coastal floodplain. Communities may also establish new or revise the existing floodway and request that the FIRM be updated to incorporate the changes at any time.

2.3 Cross Sections and Nodes

All cross sections (or nodes) should be retained within the S_XS (or S_NODES) feature classes, regardless of the flood zone they are located in. The selection of "lettered" cross sections in the combined coastal and riverine floodplain should be based on the same decision criteria used in the solely riverine portion of the floodplain. Additionally, an effort should be made to avoid intersecting coastal transects. Whether a cross section is shown on the map is controlled by the XS_LN_TYP attribute of the S_XS layer in the FIRM database. Mapped cross sections located in the coastal floodplain should remain mapped providing they do not cause overcrowding on the FIRM panel. If necessary to avoid overcrowding the FIRM panel, mapped cross sections may be changed to "not mapped" in the coastal-only floodplain. Nodes do not have the option to be "not mapped," therefore, all nodes will be mapped. Lettered, mapped and not lettered, mapped cross sections in the coastal floodplain should not be labeled with the regulatory WSEL value.