Appeals and Comments on Preliminary Maps and Reports for East Coast Central Florida Study Area: Supporting Data and Documentation

Introduction and Background

In support of the National Flood Insurance Program (NFIP), the Federal Emergency Management Agency (FEMA) has completed a coastal flood risk study for the East Coast Central Florida (ECCFL) Study Area. Based on the results of the study, FEMA has released Preliminary versions of the Flood Insurance Rate Map (FIRMs) and Flood Insurance Study (FIS) reports for Brevard, Indian River, Martin, and St. Lucie Counties and associated products displaying proposed flood hazard information.

When flood hazard information is proposed through the issuance of a Preliminary FIRM and FIS report and associated products, FEMA provides community officials and property owners with an opportunity to review and comment on the products provided before they become effective and request changes to the information shown. This statutorily required, formal review and comment period provided is referred to as the 90-day appeal period.

The type and amount of supporting data and/or documentation required will vary based on the type of appeal or comment that is submitted. This Fact Sheet clarifies the data and documentation requirements that community officials and/or property owners must submit to request changes to the information shown on the Preliminary FIRMs and/or FIS reports for the ECCFL Study Area.

Supporting Data and Documentation for Appeals

A valid appeal must be based on data and documentation which demonstrate that the proposed flood hazard information shown on a FIRM and/or in an FIS report are scientifically incorrect or technically incorrect. The distinction between scientifically incorrect and technically incorrect is important because of the differences in the types and amounts of data that a community (or a private appellant through the community) must submit to demonstrate one versus the other. Definitions of those terms are provided later in this document.
First, however, it is appropriate to discuss the meaning of the word *correct* as it applies to the flood hazard information. The flood hazard information presented on the FIRM and in the FIS report is the result of engineering methodologies and computer models that were used by the FEMA-led Project Team. Because numerous models and methodologies have been developed for determining flood elevations and flood hazard boundaries, the Project Team used their professional judgment in selecting models and methodologies that were appropriate for the study area.

For the coastal flood risk study for the ECCFL Study Area and other coastal studies in the Southeastern U.S., the Project Teams used the models below.

- **The Advanced Circulation model (ADCIRC)** is a computer program for solving time-dependent water levels and currents in two dimensions. Input to the ADCIRC model include tides and winds that simulate tropical or extratropical events. The model is built on detailed topographic, bathymetric, and land-use data.

- **The Simulating WAves Nearshore (SWAN) model** is used to simulate waves including those that are generated from landfalling hurricanes, tropical storms, and other meteorological events.

- **The Wave Height Analysis for Flood Insurance Studies (WHAFIS)** model uses representative transects to compute wave crest elevations in the study area. Transects are cross sections taken perpendicular to the shoreline that represent a segment of coast with similar characteristics. The WHAFIS model uses topographic data and other onsite conditions to develop the flood hazard areas presented on FIRMs.

In general, because the methodologies are the result of attempts to reduce complex physical processes to mathematical models, the methodologies may include simplifying assumptions. As is usual for FEMA coastal studies, methodologies were applied to the affected study area using data developed specifically for the project and specifically for the study area. Therefore, the results of the methodologies are affected by the amount of data collected and the precision of any measurements made.

Because of the judgments and assumptions that were made, the correctness of the flood hazard information is often a matter of degree, rather than absolute. For that reason, an appellant who contends that the flood hazard information was incorrect because better methodologies could have been used, better assumptions could have been made, or better data could have been used must provide alternative analyses that incorporate such methodologies, assumptions, or data.

The appellant must quantify the effect on the flood hazard information presented on the Preliminary FIRM and in the Preliminary FIS report. The data and documentation required to support various types of appeals are discussed below.

### Scientifically Incorrect Flood Elevations and/or Floodplain Boundaries

The flood elevations and floodplain boundaries shown on the Preliminary FIRM are said to be *scientifically incorrect* if the methodology/model(s) used in the determination of the elevations and/or boundaries is inappropriate or incorrect, or if the assumptions made as part of using the methodology/model(s) are inappropriate or incorrect. An appeal that is based on the flood elevations or floodplain boundaries being scientifically incorrect would, therefore, contend that the use of a different methodology/model or different assumptions would produce more accurate results.

To show that an inappropriate or incorrect coastal methodology has been used, a successful appellant must submit the following data as appropriate for the appeal:

- New coastal analyses based on the alternative methodology and original *stillwater flood elevations*, which are the projected elevations that floodwaters would assume in the absence of waves resulting from wind effects;
- Explanation for the superiority of the alternative methodology/model;
- Revised Flood Profiles, Transect Data Table, and/or Summary of Stillwater Elevations Table for the FIS report as applicable; and/or
- Revised 1-percent-annual-chance floodplain boundary delineations and/or 0.2-percent-annual-chance floodplain boundary delineations as appropriate.
Revised floodplain boundaries must be delineated on a topographic map with a scale and contour interval that meets FEMA standards.

**Technically Incorrect Flood Elevations and or Floodplain Boundaries**

The flood elevations and floodplain boundaries shown on the Preliminary FIRM are said to be technically incorrect if at least one of the following is true:

- The methodology or models used for the study were not applied correctly.
- The methodology or models used for the study were based on insufficient or poor-quality data.
- The application of the methodology or models included indisputable mathematical or measurement errors.
- The methodology or models used for the study did not account for the effects of physical changes that have occurred in the floodplain.

**Appeals Based on Contention That Methodology Has Not Been Applied Correctly**

To show that a coastal methodology was not applied correctly, an appellant would have to submit the following:

- New coastal analysis in which the methodology (i.e., ADCIRC model, SWAN model, WHAFIS model) used by the Project Team has been applied differently;
- Revised Summary of Stillwater Elevations Table;
- Revised 1-percent-annual-chance floodplain boundary delineations; and
- Revised 0.2-percent-annual-chance floodplain boundary delineations (if such boundaries are shown on the Preliminary FIRM for the flooding source in question).

Revised floodplain boundaries must be delineated on a topographic map with a scale and contour interval that meets FEMA standards.

**Appeals Based on Contention That Analysis Contains Indisputable Errors**

To show that a mathematical error was made, the appellant must identify the error. FEMA will then perform any required calculations and make the necessary changes to the FIRM, FIS report, and/or associated products.

To show that a measurement error (e.g., an incorrect surveyed elevation used in the study) was made, the appellant must identify the error and provide the correct measurement.

Any new survey data provided by the appellant must be certified by a Registered Professional Engineer or Licensed Land Surveyor. FEMA will then perform any required calculations and make the necessary changes to the FIRM, FIS report, and/or associated products.

**Appeals of Primary Frontal Dune Delineations in Coastal Areas**

The Project Team determined that a Primary Frontal Dune (PFD) exists in certain parts of the study area. A PFD is a continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward
slopes immediately landward and adjacent to the beach. The PFD is subject to erosion and overtopping from high tides and waves during major coastal storms.

The Project Team analyzed the dune to show how it will be affected by the 1-percent-annual-chance storm surge (i.e., the rise in water level associated with the passage of a major storm such as a hurricane) and wave hazards. The analysis considered whether the dune is large enough to survive a storm of this magnitude and estimated the extent of erosion expected during the storm. The Project Team also performed analyses to estimate the flooding expected landward of the eroded dune.

The landward toe of a PFD is located at the point where there is a distinct change from a relatively steep slope to a relatively mild slope. The VE zone, also known as the Coastal High Hazard Area (CHHA), was extended inland to the landward toe of the PFD toe. The CHHA is the area affected by high-velocity waves that are 3 feet or higher.

To change the delineation of the PFD, the appellant must submit the following:

- Written description of suggested changes to PFD mapping;
- Topographic data for the PFD area;
- Cross-shore survey transects of the PFD; and
- Revised mapping of the PFD.

Appeals of Limit of Moderate Wave Action Delineations in Coastal Areas

Another feature that only appears on FIRMs affected by coastal flood hazards is the Limit of Moderate Wave Action (LiMWA). The LiMWA marks the inland limit of the area inundated by the 1-percent-annual-chance, 1.5-foot breaking wave. See the figure below.

The LiMWA is provided on the FIRM, for informational purposes, because these moderate waves can cause significant damage to structures; the damage would not be as severe as the damage caused by the 1-percent-annual-chance, 3-foot breaking waves that occur in the CHHA.

To change the delineation of the LiMWA, the appellant must submit the following:

- Written description of suggested changes to the LiMWA;
- Topographic data for the LiMWA area;
- Wave modeling or other wave data analysis showing changes in the LiMWA; and
- Revised mapping of the LiMWA.

Appeals of Floodplain Boundary Delineations Based on Newer or More Detailed Topographic or Elevation Data

The Project Team made every effort to use the most accurate and up-to-date topographic data available in delineating the floodplain boundaries in areas studied by detailed methods. However, if topographic maps or other ground elevation data that are of greater detail than those used by the Project Team or that show more recent topographic conditions are available, FEMA will use those data to revise the floodplain boundaries shown on the FIRM.
The approximate floodplain boundaries shown on the Preliminary FIRM were delineated using the best available data. If more detailed data or analyses are available, FEMA would use the submitted data or analyses to revise the floodplain boundary delineations. Such data and analyses would include the following:

- Published flood maps that are more recent or more detailed than those used by FEMA; and
- Analyses that are more detailed than those performed by the Project Team or that are based on better data than those used by the Project Team.

All maps and other supporting data provided by the appellant must be certified by a Registered Professional Engineer or Licensed Land Surveyor and must reflect existing conditions. Maps prepared by an authoritative source, such as a Federal agency (e.g., U.S. Army Corps of Engineers, U.S. Geological Survey, U.S. Bureau of Reclamation) or a State department of highways or transportation, are acceptable without certification as long as the sources and dates of the maps are identified.

For appeal submittals that involve topographic data, the following additional guidelines must be followed:

- The data must be submitted in a digital Geographic Information System (GIS) format.
- The appeal must clearly state which flooding source(s) are the subject of the appeal.
- Updated 1-percent-annual-chance floodplain boundaries, in digital GIS format.

All topographic data must adhere to the current FEMA data capture standards for such data. The appellant must provide a data sharing agreement, when necessary.

Supporting Data and Documentation for Comments

Challenges of the Preliminary FIRM and/or FIS report submitted during the 90-day appeal period that do not relate to new or modified flood hazard information are considered comments. Comments include, but are not limited to, the following:

- Impacts of changes that have occurred in the floodplain that should have previously been submitted in accordance with Section 65.3 of the NFIP regulations;
- Corporate limit changes;
- Road name and configuration changes;
- Requests that changes effected by Letter of Map Change – i.e., Letter of Amendment (LOMA), Letter of Map Revision Based on Fill (LOMR-F), or Letter of Map Revision (LOMR) – be incorporated;
- Base map errors; or
- Other possible omissions or potential improvements to the mapping.

The data and documentation that must be submitted to support comments are discussed below.

Impacts of Changes in a Floodplain That Were Not Submitted Previously to FEMA

As noted in Section 65.3 of the NFIP regulations, the flood elevations in a community may increase or decrease as a result of physical changes affecting flooding conditions. Therefore, as soon as practicable, but not later than 6 months after the date such information becomes available, the community is to notify FEMA of the changes by submitting technical or scientific data in accordance with Part 65 of the NFIP regulations.

For comments based on the effects of physical changes that have occurred in the 1-percent-annual-chance floodplain, appellants must identify the changes that have occurred and provide the data FEMA needs to perform a revised analysis. Required data might include the following:

- Topographic maps;
- Grading plans;
- New stream channel and floodplain cross sections; or
- Dimensions of structures.

Corporate Limit Changes

The corporate limits shown on the Preliminary FIRM were taken from community maps or other authoritative source materials obtained by the Project Team from community officials or other non-Federal sources, which must meet FEMA criteria, or U.S. Geological Survey
Digital Orthophoto Quadrangles. The Project Team used the Digital Orthophoto Quadrangles where community base map data either were not submitted or did not meet FEMA criteria.

If a community submits a comment to change the corporate limits shown on the FIRM, the community CEO, FPA, or other designated official must submit appropriate updates to the previously provided base map data or a geospatially accurate map that can be considered for revising the digital base map.

**Road Name and Configuration Changes**

On the preliminary version of the FIRM, the Project Team shows all roads that are in or adjacent to the mapped 1-percent-annual-chance floodplain. If a community or individual appellant chooses to submit a comment to change the locations and names of roads in or adjacent to the mapped 1-percent-annual-chance floodplains, the community CEO, FPA, or other designated official must submit appropriately registered maps or updates to the community-supplied base map data showing the names and locations of the new or revised roads.

**Changes to Incorporate Effective Letters of Map Change**

As part of the development of the Preliminary FIRM and FIS report, the Project Team incorporates all mappable amendments and revisions that were effected by FEMA through the issuance of LOMAs, LOMR-Fs, and LOMRs. To request that the results of an effective, mappable LOMA, LOMR-F, or LOMR be reflected on the FIRM and/or in the FIS report in the area where new or modified flood hazard information has been proposed, the CEO, FPA, or other designated community official must submit a written request indicating the case number and effective date of the LOMA, LOMR-F, or LOMR and/or a written request transmitting a copy of the LOMA, LOMR-F, or LOMR.

**Changes to Correct Base Map Errors**

To support a request that FEMA correct an error in the base map used for the FIRM, the community must submit appropriate updates to the previously provided base map data or a geospatially accurate map that can be considered for revising the digital base map.

**General Technical Guidance**

When developing technical support data or documentation, appellants need to consider the information below.

- Unless appeals are based on indisputable mathematical or measurement errors or the effects of physical changes that have occurred in the floodplain, they must be accompanied by all data that FEMA needs to revise the Preliminary FIRM panel(s) and FIS report materials. Therefore, for coastal flood hazard areas, appellants should be prepared to perform coastal analyses and to provide revised floodplain boundary delineations as necessary.

- New flood hazard information cannot be added to a FIRM panel in such a way as to create mismatches with the flood hazard information shown for adjacent FIRM panels. Therefore, in performing new analyses and developing revised flood hazard information, appellants must use good engineering judgment to tie the new flood elevations and floodplain boundaries into the new flood elevations and floodplain boundaries into those shown on FIRM panel(s) for areas that are not affected by the appeal.

- For appeals involving new coastal surge values, extensive changes in hydraulic conditions, or complex situations in which changes made to the flood hazard information developed for one flooding source will affect the flood hazard information developed for others, appellants may be required to provide new information for a large portion of the mapped area.

- All analyses and data submitted by appellants, including those that show mathematical or measurement errors, must be certified by a Registered Professional Engineer or Licensed Land Surveyor, as appropriate.

- Appeals and comments cannot be based on the effects of proposed projects or future conditions.

- If coastal storm surge analyses are performed, they must be performed for the same recurrence interval floods as those performed for the study.
Unless appeals are based on the use of alternative models or methodologies, the coastal analyses that appellants submit must be performed using the coastal models used by the Project Team. The analysis methods used to study coastal flooding sources are documented in Section 5.3 of the Preliminary FIS report.

Information on the models used for the analysis of the hazards associated with coastal storm surge and wave action, including wave height and wave runup, are documented in Section 5.3 of the Preliminary FIS report.

As required by Paragraph 65.6(a)(6) of the NFIP regulations, when appeals are based on the use of an alternative hydrologic or hydraulic model, the appellant must show that several conditions have been met.

- The model used must have been reviewed and accepted for general use by a Federal agency responsible for floodplain identification or regulation or a notable scientific body.
- The model has been well documented (with a user's manual that includes source codes).
- The model must be available to all present and future parties affected by the FIRM that has been developed or amended through the use of the model.

If appeals involve changing the floodplain boundaries shown on the Preliminary FIRM, the appellant is required to submit delineations of both the 1- and 0.2-percent-annual-chance floodplain boundaries because both 1- and 0.2-percent-annual-chance floodplain boundary delineations are shown on the Preliminary FIRM.

Community officials may request that FEMA provide them with copies of the input and output data from the model(s) used by the Project Team or copies of other calculations or analyses performed by the Project Team.

The community CEO, FPA, or other community official designated by the CEO should submit such requests, in writing, to the attention of Mark A. Viera, the FEMA Coastal Flood Risk Study Lead, at the address below.

Federal Emergency Management Agency
Mitigation Division
3003 Chamblee Tucker Road
Atlanta, GA 30341

For More Information

Technical questions regarding the appeal process in general, and the coastal flood risk study for the ECCFL Study Area in particular, can be sent via email to Mark A. Viera, the FEMA Coastal Flood Risk Study Lead, at mark.viera@fema.dhs.gov.

For more information on the coastal flood risk study for the ECCFL Study Area, please visit www.southeastcoastalmaps.com/pages/projects/east-coast-central-florida.aspx.