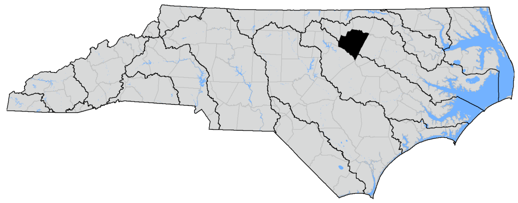
PRELIMINARY FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

A Report of Flood Hazards in

FRANKLIN COUNTY, NORTH CAROLINA AND INCORPORATED AREAS



Community Name	Community Number
FRANKLIN COUNTY	370377
TOWN OF BUNN	370329
TOWN OF CENTERVILLE	370357
TOWN OF FRANKLINTON	370497
TOWN OF LOUISBURG	370098
TOWN OF YOUNGSVILLE	370494

NORTH CAROLINA
Cooperating Technical State
FEMA'S COOPERATING TECHNICAL PARTNER

PRELIMINARY: 3/31/2015

REVISED: 3/31/2015

Federal Emergency Management Agency

State of North Carolina

Flood Insurance Study Number

37069CV000

www.fema.gov and www.ncfloodmaps.com

FOREWORD

This countywide Flood Insurance Study (FIS) Report was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long-term approach to floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the state level. As a part of this effort, the State of North Carolina has joined with FEMA in a Cooperating Technical State (CTS) agreement to produce and maintain this FIS Report and the accompanying digital Flood Insurance Rate Map (FIRM) for North Carolina.

NOTICE TO FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

The following is a list of the publication dates of this Countywide FIS Report starting with the initial Report accompanying the North Carolina Statewide FIRM:

Date	Reason
1/16/2004	Initial Countywide FIS Report Effective Date

This FIS has been produced as part of the North Carolina Floodplain Mapping Program. Franklin County, North Carolina, falls under the administrative jurisdiction of Region IV of the Federal Emergency Management Agency (FEMA). Questions concerning this FIS may be directed to the North Carolina Floodplain Mapping Program at www.ncfloodmaps.com, the FEMA Map Assistance Center by calling the toll-free information line at 1-877-FEMA MAP (1-877-336-2627), or by contacting the FEMA Regional Office at the following address:

FEMA, Federal Insurance and Mitigation Administration

Koger Center - Rutgers Building

3003 Chamblee Tucker Road

Atlanta, Georgia 30341

(770) 220-5400

Table of Contents

Figures **Page**

1.0 Introduction

1.1 The National Flood Insurance Program

In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer-funded disaster relief for flood victims and the increasing amount of damage caused by floods. The NFIP makes federally backed flood insurance available in communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage. Federally backed flood insurance is available in more than 19,000 communities across the United States and its territories.

The NFIP is managed by the Federal Insurance and Mitigation Administration of the Federal Emergency Management Agency (FEMA). The Federal Insurance and Mitigation Administration manages the insurance component of the NFIP and oversees the flood hazard mapping and the floodplain management aspects of the program.

The NFIP, through involvement with communities, the insurance industry, and the lending industry, helps reduce flood damage by nearly $800 million a year. Further, buildings constructed in compliance with NFIP building standards suffer approximately 80% less damage annually than those not built in compliance. In addition, every $3 paid in flood insurance claims saves $1 in disaster assistance payments. The NFIP is self-supporting for the average historical loss year, which means that operating expenses and flood insurance claims are not paid by the taxpayer, but through premiums collected for flood insurance policies.

Additional information of interest to homeowners, community officials, insurance companies, lenders, and study contractors is available in Section 9.0 of this FIS Report and on the NFIP Internet homepage at http://www.fema.gov/business/nfip/.

1.2 Purpose of this Flood Insurance Study

Flood Insurance Studies (FISs) are one of the primary means by which the NFIP administers the National Flood Insurance Act of 1968, the Flood Disaster Protection Act of 1973, and the National Flood Insurance Reform Act of 1994. FISs develop flood risk data that are used to establish actuarial flood insurance rates. The information in this FIS Report will also be used by Franklin County and the jurisdictions therein (hereinafter referred to collectively as Franklin County) to facilitate the adoption and maintenance of floodplain management ordinances, which form the basis of communities' continued participation in the NFIP. Minimum requirements for participation in the NFIP are set forth in Title 44, Part 60, Section 3 of the Code of Federal Regulations (44 CFR 60.3). In some States and/or communities, floodplain management criteria or regulations may exist that are more restrictive than the minimum Federal requirements. In such cases, the more restrictive criteria will take precedence, and the State and/or community (or other jurisdictional agency) will be able to explain them.

This FIS investigates the existence and severity of flood hazards in, or revises and updates previous FISs for, the geographic area of Franklin County, North Carolina, including the jurisdictions listed in Table 1.

Table 1 - Jurisdictions in Franklin County

Community	Included in this FIS	If Not Included, Location of Flood Hazard/Flood Insurance Rate Data
FRANKLIN COUNTY	Yes	*
TOWN OF BUNN	Yes	*
TOWN OF CENTERVILLE	Yes	*
TOWN OF FRANKLINTON	Yes	*
TOWN OF LOUISBURG	Yes	*
TOWN OF WAKE FOREST	No	
TOWN OF YOUNGSVILLE	Yes	*

1.3 FIS Components

A Flood Insurance Study (FIS) is an analysis of flood hazards, typically presented as a set of Flood Insurance Rate Map (FIRM) panels and the FIS Report, which includes a set of Flood Profiles and/or Water-surface elevation rasters.

Flood Insurance Study Report

The FIS Report provides a context for the information shown on the FIRM, as well as a summary of the data upon which the analyses are based. It also includes an index of sources of additional information on the NFIP.

1.4 Considerations for Using this Flood Insurance Study Report

The NFIP encourages State and local governments to implement sound floodplain management programs. To assist in this endeavor, each FIS Report provides floodplain data, which may include a combination of the following: 10-, 4-, 2-, 1-, and 0.2-percent annual chance flood elevations (the 1% annual chance flood elevation is also referred to as the Base Flood Elevation (BFE)); delineations of the 1% annual chance and 0.2% annual chance floodplains; and 1% annual chance floodway. This information is presented on the FIRM and/or in many components of the FIS Report, including Flood Profiles, Floodway Data tables, Summary of Non-Coastal Stillwater Elevations tables, and Coastal Transect Parameters tables (not all components may be provided for a specific FIS).

It is, therefore, the responsibility of the user to consult with community officials by contacting the community repository to obtain the most current FIS Report components. Communities participating in the NFIP have established repositories of flood hazard data for floodplain management and flood insurance purposes. Community map repository addresses are provided in Table 27, “Map Repositories,” within this FIS Report.

New FIS Reports are frequently developed for multiple communities, such as entire counties. A countywide FIS Report incorporates previous FIS Reports for individual communities and the unincorporated area of the county (if not jurisdictional) into a single document and supersedes those documents for the purposes of the NFIP.

The Initial Countywide FIS Report for Franklin became Effective on 1/16/2004. Refer to Table XX for information about subsequent revisions to FIRMs.

Selected FIRM panels for the community may contain information (such as floodways and cross sections) that was previously shown separately on the corresponding Flood Boundary and Floodway Map panels. In addition, former flood hazard zone designations have been changed as follows:

Old Zone	New Zone
A1 through A30	AE
V1 through V30	VE
B	X (shaded)
C	X (unshaded)

FEMA does not impose floodplain management requirements or special insurance ratings based on Limit of Moderate Wave Action (LiMWA) delineations at this time. The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. If the LiMWA is shown on the FIRM, it is being provided by FEMA as information only. For communities that do adopt Zone VE building standards in the area defined by the LiMWA, additional Community Rating System (CRS) credits are available. Refer to Section 2.5.4 for additional information about the LiMWA.

The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Visit the FEMA Web site at http://www.fema.gov or contact your appropriate FEMA Regional Office for more information about this program.

Previous FIS Reports and FIRMs may have included levees that were accredited as reducing the risk associated with the 1% annual chance flood based on the information available and the mapping standards of the NFIP at that time. For FEMA to continue to accredit the identified levees, the levees must meet the criteria of the Code of Federal Regulations, Title 44, Section 65.10 (44 CFR 65.10), titled

“Mapping of Areas Protected by Levee Systems.

Since the status of levees is subject to change at any time, the user should contact the appropriate agency for the latest information regarding levees presented in Table 9 of this FIS Report. For levees owned or operated by the U.S. Army Corps of Engineers (USACE), information may be obtained from the USACE national levee database. For all other levees, the user is encouraged to contact the appropriate local community.

FEMA has developed a Guide to Flood Maps (FEMA 258) and online tutorials to assist users in accessing the information contained on the FIRM. These include how to read panels and step-by-step instructions to obtain specific information. To obtain this guide and other assistance in using the FIRM, visit the FEMA Web site at http://www.fema.gov.

2.0 Floodplain Management Applications

Flood events of a magnitude expected to occur with a 10%, 2%, 1%, or 0.2% annual chance have been selected as having special significance for developing sound floodplain management programs. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10%, 2%, 1%, and 0.2% chance, respectively, of being equaled in any given year. Therefore, FIS Reports typically determine water-surface elevations for floods with these probabilities. The FIRM delineates 1% and 0.2% annual chance floodplains and 1% annual chance floodway boundaries, and depicts 1% annual chance flood elevations, rounded to the nearest foot, to assist in developing floodplain management measures.

2.1 Floodplains

To provide a national standard without regional discrimination, the 1% annual chance flood has been adopted by FEMA as the base flood for floodplain management purposes. A 1% annual chance flood, or base flood, is defined as that having a 1% chance of being equaled or exceeded in any given year. The 1% annual chance floodplains shown on the FIRM identify areas that are expected to be inundated by the 1% annual chance flood. This 1% annual chance floodplain is also called a Special Flood Hazard Area (SFHA), where the NFIP’s floodplain management regulations must be enforced by the community as a condition of participation in the NFIP. The 0.2% annual chance floodplain is employed to indicate additional areas of flood risk associated with exceptionally severe floods.

2.2 Floodways

Encroachment on floodplains such as that caused by placement of structures and fill reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, floodways are provided as a tool to assist local communities in this aspect of floodplain management. Under this concept, the 1% annual chance riverine floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. Figure 1, “Floodway Schematic,” illustrates this principle. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this FIS are presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional encroachment studies.

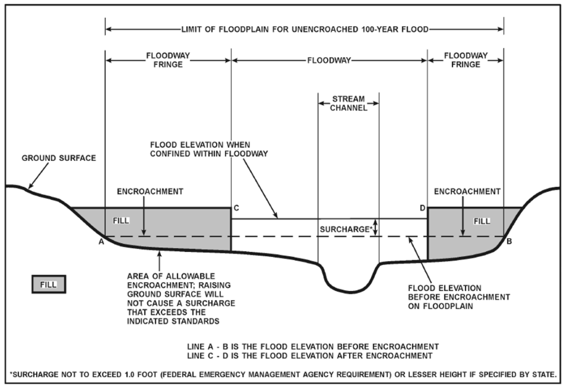


Figure 1- Floodway Schematic

2.3 Base Flood Elevations

The hydraulic characteristics of flooding sources were analyzed to provide estimates of the elevations of floods of the selected recurrence intervals. The Base Flood Elevation (BFE) is the elevation of the 1% annual chance flood. These BFEs are most commonly rounded to the whole foot, as shown on the FIRM, but in certain circumstances or locations they may be rounded to 0.1 foot. Cross section lines shown on the FIRM may also be labeled with the BFE rounded to 0.1 foot. Whole-foot BFEs derived from engineering analyses that apply to coastal areas, areas of ponding, or other static areas with little elevation change may also be shown at selected intervals on the FIRM. Cross sections with BFEs shown on the FIRM correspond to the cross sections shown in the Floodway Data table and Flood Profiles in this FIS Report. BFEs are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS Report in conjunction with the data shown on the FIRM.

2.4 Watershed Characteristics

Because a FIS is a probability analysis that may not account for some of the factors listed below, communities are strongly encouraged to consider adopting more restrictive or higher floodplain management criteria or ordinances than the minimum Federal requirements. Communities may also increase the validity of their flood hazard data by investing in continuous maintenance of river gages (see the Data Validity and Reliability paragraph below). If the U.S. Geological Survey (USGS) or other agencies do not maintain gages on the flooding sources of interest, partnerships with the USGS may be pursued, or local gages may be installed. For more information, see Section 9.0 of this report.

This flood hazard study represents an analysis of certain watershed characteristics, some of which are summarized as follows:

Drainage Area
In general, streams that drain larger areas have greater flood hazards. FISs, in North Carolina, do not typically analyze flood hazards in places with rural drainage areas of less than one square mile and within urban drainage areas of less than ½ square mile.

Soil Permeability and Infiltration
Differences in the types of soil and the amount of vegetation in a watershed have a significant effect on the amount of water that the soil can absorb; soils with a high sand content absorb much more water than soils with a high clay content. The presence of vegetation increases infiltration; the presence of pavement decreases infiltration and also speeds runoff to receiving waters. As soil permeability and infiltration decrease, the volume and rate of overland flow increases.

Soil Moisture Conditions
In addition to soil permeability and infiltration, the level of the water table helps determine the saturation point, beyond which no water is absorbed. As rainfall duration increases, the height of the water table increases.

Channel and Floodplain Geometry
The geometric contour of a streambed, termed channel geometry, and the geometric contour of a floodplain determine the volume of water that a channel can hold and partially determine the rate at which water flows through it.

Channel and Floodplain Roughness

The roughness of a surface affects the characteristics of runoff whether the water is on the surface of the watershed or in the channel.

FIS Reports include analyses of how these factors will combine to produce overland flow patterns during floods that have a certain probability of occurring in any given year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at shorter intervals or even within the same year. The risk of experiencing a rare flood increases when longer periods are considered. For example, the risk of having a flood which equals or exceeds the 1% annual chance flood (1% chance of annual exceedence) in any 50-year period is approximately 40% (4 in 10), but for any 90-year period, the risk increases to approximately 60% (6 in 10).

It is important to note that the 1% annual chance flood is used as the national standard to allow a consistent approach to floodplain management, flood hazard assessment, and flood hazard mapping. In any given community, a number of factors may result in flooding characteristics that do not conform to predicted conditions. Therefore, the determination that an area is not shown on the FIRM as being within a Special Flood Hazard Area is no guarantee that it will not flood during a 1% annual chance flood. Examples of these factors include Data Validity and Reliability; Developmental and Topographic Changes Over Time; Erosion, Deposition, and Debris Flow; and Meandering and Lateral Migration.

Data Validity and Reliability

Certain types of analysis methods yield more justifiable characterizations of flood hazards. For example, a gage analysis, to determine peak discharges, is based on actual measurements of watershed conditions over time and, therefore, is typically considered the most accurate method of hydrologic analysis. However, it is not feasible to install enough gages to gather data on every stream. In addition, for many of the gage sites that do exist, there are interruptions in the period of record. The usefulness of gage data for the purpose of predicting flooding behavior decreases with interruptions in the period of record; predicted flooding conditions over a 100-year period based on 20 years of measurements spread over a 35-year period are less valid than those based on 30 years of continuous measurements. A regression analysis is typically considered the best method in the absence of gage data, as it uses gage data from watersheds with similar characteristics to estimate flood frequency and magnitude in an ungaged watershed. Regression equations reflect average conditions for a region; therefore, the results will not exactly match the results of a gage analysis at a particular location. The standard errors of the North Carolina rural regression equations range from 44 to 51 percent for estimates of the 1% annual chance flood. That means the difference between the results of the regression equation and the gage analysis for approximately two-thirds of the locations that gage data exists are within 44 to 51 percent of the gage analysis results. A rainfall-runoff hydrologic analysis may be used for gaged or ungaged watersheds, and can estimate the effects of storage areas and flood control structures and measures. This method is most valid when calibrated against historical data.

Developmental and Topographic Changes Over Time

A FIRM is based on the best topographic and planimetric information available to FEMA and the State of North Carolina at the time the study is produced. In time, however, development and/or natural phenomena can alter the physical characteristics of a watershed and its drainage channels, resulting in changes in the flood hazards in those areas. For example, constructing a housing subdivision reduces the amount of soil that is available to absorb water; this in turn causes an increase in the volume of surface water that flows into the channel.

Erosion, Deposition, and Debris Flow

The flood hazards shown on a FIRM are based on the assumption of unobstructed flow. The FIRM does not reflect an analysis of areas that are subject to erosion caused by the increased water-surface elevations and velocities that occur during flooding. In addition to the risks of landslides or a weakening of the ground underneath roads or structures, any sediment that is removed from one location will be deposited in another; accumulated deposits may have a pronounced effect on flood hazards in those areas. Similarly, debris such as fallen trees or branches, litter, or other items may obstruct stream channels or hydraulic structures, increasing water-surface elevations, velocities, and floodplain width.

Meandering and Lateral Migration

FISs are based on the assumption that channel geometry will remain stable during normal drainage and during flood events. This assumption is valid for most streams, which flow over bedrock or between bedrock outcroppings that form non-alluvial channels. However, alluvial streams change the channel geometry with time, significantly so during flood events. Alluvial streams are subject to erosion and deposition, which may result in braided or meandering channels. Streams of this type may be characterized by lateral migration, or channel shifting, in which the stream may change course entirely during a flood. Whenever clear evidence is available, a FIRM will identify the alluvial nature of a studied flooding source and designate wider floodways to allow for potential migration. However, these floodways are based on qualitative assessments and not on quantitative geomorphic and engineering analyses.

2.5 Coastal Flood Hazard Areas

For most areas along rivers, streams, and small lakes, BFEs and floodplain boundaries are based on the amount of water expected to enter the area during a 1% annual chance flood and the geometry of the floodplain. Floods in these areas are typically caused by storm events. However, for areas on or near ocean coasts, large rivers, or large bodies of water, BFE and floodplain boundaries may need to be based on additional components, including storm surges and waves. Communities on or near ocean coasts face flood hazards caused by offshore seismic events as well as storm events.

Coastal flooding sources that are included in this Flood Risk Project are shown in Table XX.

2.5.1 Water Elevations and the Effects of Waves

Specific terminology is used in coastal analyses to indicate which components have been included in evaluating flood hazards.

The stillwater elevation (SWEL or still water level) is the surface of the water resulting from astronomical tides, storm surge, and freshwater inputs, but excluding wave setup contribution or the effects of waves.

- *Astronomical tides* are periodic rises and falls in large bodies of water caused by the rotation of the earth and by the gravitational forces exerted by the earth, moon and sun.
- *Storm surge* is the additional water depth that occurs during large storm events. These events can bring air pressure changes and strong winds that force water up against the shore.
- *Freshwater inputs* include rainfall that falls directly on the body of water, runoff from surfaces and overland flow, and inputs from rivers.

The 1% annual chance stillwater elevation is the stillwater elevation that has been calculated for a storm surge from a 1% annual chance storm. The 1% annual chance storm surge can be determined from analyses of tidal gage records, statistical study of regional historical storms, or other modeling approaches. Stillwater elevations for storms of other frequencies can be developed using similar approaches.

The total stillwater elevation (also referred to as the mean water level) is the stillwater elevation plus wave setup contribution but excluding the effects of waves.

- *Wave setup* is the increase in stillwater elevation at the shoreline caused by the reduction of waves in shallow water. It occurs as breaking wave momentum is transferred to the water column.

Like the stillwater elevation, the total stillwater elevation is based on a storm of a particular frequency, such as the 1% annual chance storm. Wave setup is typically estimated using standard engineering practices or calculated using models, since tidal gages are often sited in areas sheltered from wave action and do not capture this information.

Coastal analyses may examine the effects of overland waves by analyzing storm-induced erosion, overland wave propagation, wave runup, and/or wave overtopping.

- *Storm-induced erosion* is the modification of existing topography by erosion caused by a specific storm event, as opposed to general erosion that occurs at a more constant rate.
- *Overland wave propagation* describes the combined effects of variation in ground elevation, vegetation, and physical features on wave characteristics as waves move onshore.
- *Wave runup* is the uprush of water from wave action on a shore barrier. It is a function of the roughness and geometry of the shoreline at the point where the stillwater elevation intersects the land.
- *Wave overtopping* refers to wave runup that occurs when waves pass over the crest of a barrier.

Figure 5: Wave Runup Transect Schematic

2.5.2 Floodplain Boundaries and BFEs for Coastal Areas

For coastal communities along the Atlantic and Pacific Oceans, the Gulf of Mexico, the Great Lakes, and the Caribbean Sea, flood hazards must take into account how storm surges, waves, and extreme tides interact with factors such as topography and vegetation. Storm surge and waves must also be considered in assessing flood risk for certain communities on rivers or large inland bodies of water.

Beyond areas that are affected by waves and tides, coastal communities can also have riverine floodplains with designated floodways, as described in previous sections.

Floodplain Boundaries

In many coastal areas, storm surge is the principle component of flooding. The extent of the 1% annual chance floodplain in these areas is derived from the total stillwater elevation (stillwater elevation including storm surge plus wave setup) for the 1% annual chance storm. The methods that were used for calculation of total stillwater elevations for coastal areas are described in Section 5.3 of this FIS Report. Location of total stillwater elevations for coastal areas are shown in Figure 8, “1% Annual Chance Total Stillwater Levels for Coastal Areas.

In some areas, the 1% annual chance floodplain is determined based on the limit of wave runup or wave overtopping for the 1% annual chance storm surge. The methods that were used for calculation of wave hazards are described in Section 5.3 of this FIS Report.

Table 18 and 18P presents the types of coastal analyses that were used in mapping the 1% annual chance floodplain in coastal areas.

Coastal BFEs

CWhere they apply, coastal BFEs are calculated along transects extending from offshore to the limit of coastal flooding onshore. Results of these analyses are accurate until local topography, vegetation, or development type and density within the community undergoes major changes.

Parameters that were included in calculating coastal BFEs for each transect included in this FIS Report are presented in Table 20, “Coastal Transect Parameters.” The locations of transects are shown in Figure 9, “Transect Location Map.” More detailed information about the methods used in coastal analyses and the results of intermediate steps in the coastal analyses are presented in Section 5.3 of this FIS Report. Additional information on specific mapping methods is provided in Section 6.4 of this FIS Report.

2.5.3 Coastal High Hazard Areas

Certain areas along the open coast and other areas may have higher risk of experiencing structural damage caused by wave action and/or high-velocity water during the 1% annual chance flood. These areas will be identified on the FIRM as Coastal High Hazard Areas.

- *Coastal High Hazard Area (CHHA)* is a SFHA extending from offshore to the inland limit of the primary frontal dune (PFD) or any other area subject to damages caused by wave action and/or high-velocity water during the 1% annual chance flood.
- *Primary Frontal Dune (PFD)* is a continuous or nearly continuous mound or ridge of sand with relatively steep 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.

CHHAs are designated as “V” zones (for “velocity wave zones”) and are subject to more stringent regulatory requirements and a different flood insurance rate structure. The areas of greatest risk are shown as VE on the FIRM. Zone VE is further subdivided into elevation zones and shown with BFEs on the FIRM.

The landward limit of the PFD occurs at a point where there is a distinct change from a relatively steep slope to a relatively mild slope; this point represents the landward extension of Zone VE. Areas of lower risk in the CHHA are designated with Zone V on the FIRM. More detailed information about the identification and designation of Zone VE is presented in Section 6.4 of this FIS Report.

Areas that are not within the CHHA but are SFHAs may still be impacted by coastal flooding and damaging waves; these areas are shown as “A” zones on the FIRM.

Figure 6, “Coastal Transect Schematic,” illustrates the relationship between the base flood elevation, the 1% annual chance stillwater elevation, and the ground profile as well as the location of the Zone VE and Zone AE areas in an area without a PFD subject to overland wave propagation. This figure also illustrates energy dissipation and regeneration of a wave as it moves inland.

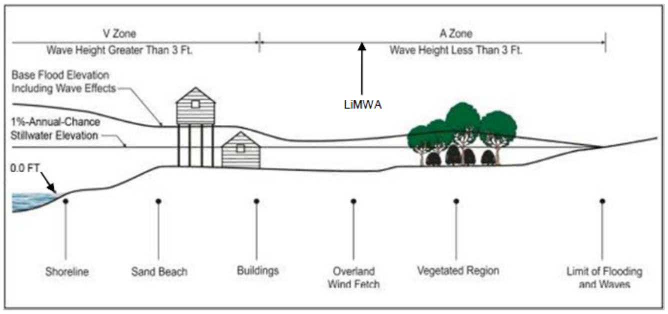


Figure 6: Coastal Transect Schematic

Methods used in coastal analyses in this Flood Risk Project are presented in Section 5.3 and mapping methods are provided in Section 6.4 of this FIS Report.

Coastal floodplains are shown on the FIRM using the symbology described in Figure 3, “Map Legend for FIRM.” In many cases, the BFE on the FIRM is higher than the stillwater elevations shown in Table 17 due to the presence of wave effects. The higher elevation should be used for construction and/or floodplain management purposes.

2.5.4 Limit of Moderate Wave Action

Laboratory tests and field investigations have shown that wave heights as little as 1.5 feet can cause damage to and failure of typical Zone AE building construction. Wood-frame, light gage steel, or masonry walls on shallow footings or slabs are subject to damage when exposed to waves less than 3 feet in height. Other flood hazards associated with coastal waves (floating debris, high velocity flow, erosion, and scour) can also damage Zone AE construction.

Therefore, a LiMWA boundary may be shown on the FIRM as an informational layer to assist coastal communities in safe rebuilding practices. The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. The location of the LiMWA relative to Zone VE and Zone AE is shown in Figure 6.

The effects of wave hazards in Zone AE between Zone VE (or the shoreline where Zone VE is not identified) and the limit of the LiMWA boundary are similar to, but less severe than, those in Zone VE where 3-foot or greater breaking waves are projected to occur during the 1% annual chance flooding event. Communities are therefore encouraged to adopt and enforce more stringent floodplain management requirements than the minimum NFIP requirements in the LiMWA. The NFIP Community Rating System provides credits for these actions.

Where wave runup elevations dominate over wave heights, there is no evidence to date of significant damage to residential structures by runup depths less than 3 feet. Examples of these areas include areas with steeply sloped beaches, bluffs, or flood protection structures that lie parallel to the shore. In these areas, the FIRM shows the LiMWA immediately landward of the VE/AE boundary. Similarly, in areas where the zone VE designation is based on the presence of a primary frontal dune or wave overtopping, the LiMWA is delineated immediately landward of the Zone VE/AE boundary.

3.0 Insurance Applications

3.1 National Flood Insurance Program Insurance Zones

For flood insurance applications, the FIRM designates flood insurance rate zones and, in 1% annual chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies. Table 2, “Flood Zone Designations,” includes a description of each type of flood hazard zone.

Table 2 - Flood Designations

Zone	Description
A	Zone A is the flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined in the FIS Report by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no Base Flood Elevations or depths are shown within this zone.
AE	Zone AE is the flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined in the FIS Report by detailed methods. In most instances, whole-foot Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.
AH	Zone AH is the flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.
AO	Zone AO is the flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.
AR	Zone AR is the flood insurance rate zone that corresponds to areas that were formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
A99	Zone A99 is the flood insurance rate zone that corresponds to areas of the 1% annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No Base Flood Elevations or depths are shown within this zone.
V	Zone V is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no Base Flood Elevations are shown within this zone.
VE	Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Whole-foot Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.
X	Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2% annual chance floodplain, areas within the 0.2% annual chance floodplain, and to areas of 1% annual chance flooding where average depths are less than 1 foot, areas of 1% annual chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1% annual chance flood by levees. No Base Flood Elevations or depths are shown within this zone.
X (Future)	Zone X (Future Base Flood) is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined based on future-conditions hydrology. No BFEs or base flood depths are shown within this zone.
D	Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

3.2 Coastal Barrier Resources System

3.2 Coastal Barrier Resources System

This section is not applicable to this FIS project.

4.0 Area Studied

Franklin County is found in the Piedmont region of North Carolina. It is surrounded by Vance and Warren Counties to the north, Nash County to the east, Johnston and Wake Counties to the south, and Granville County to the west.

4.1 Basin Description

Table 3, “Basin Description” contains a description of the characteristics of the HUC-8 sub-basins within which each community falls. The table includes the main flooding sources within each basin, a brief description of the basin, and its area.

Table 3 - Basin Description

HUC-8 Sub-Basin Name	HUC-8 Sub-Basin Number	Primary Flooding Source	Description	HUC Area (square miles)
Contentnea	03020203	Contentnea Creek	The Contentnea Creek Basin begins in southern Franklin County and drains southeast through significant portions of Greene, Nash, Pitt, Wayne, and Wilson Counties. The basin ends at the confluence with Neuse River in Craven County.	1,008
Fishing	03020102	Fishing River	The Fishing River Basin begins in eastern Vance County and drains southeast through Warren and Halifax Counties. The basin ends in Edgecombe County where Fishing River confluences with Tar River.	894
Upper Neuse	03020201	Neuse River	The Upper Neuse Basin is initially drained by the Eno and Flat Rivers in Orange County. Once they confluence near Falls Lake, the basin is then drained by the Neuse River which flows through Durham, Wake, and Johnston Counties.	2,406
Upper Tar	03020101	Tar River	The Upper Tar River Basin begin in east Person County and drains significant portions of Edgecombe, Franklin, Granville, Nash, and Vance Counties along the Tar River.	1,305

4.2 Principal Flood Problems

Table 4, “Principal Flood Problems” contains a list of principal flooding problems in Franklin County.

Table 4 - Principal Flood Problems

Flooding Source	Problem
All Sources	Major flooding in the area is caused primarily by runoff from rain and thunderstorms, but occasionally large floods are caused by hurricanes and tropical storms. In 1996, Hurricane Fran caused extensive countywide flooding and wind damage.
All Sources	Major flooding in the area is caused primarily by runoff from rain and thunderstorms, but occasionally large floods are caused by hurricanes and tropical storms. In 1996, Hurricane Fran caused extensive countywide flooding and wind damage.

4.3 Historic Flood Elevations

Hurricane Floyd

(9/16/1999)

Hurricane Floyd made landfall near Wilmington with category two winds of 105 to 110 mph. Rainfall totals from Floyd were as high as 15 to 20 inches over portions of eastern North Carolina; with a record of 23.45 inches of rain falling in the month of September at Wilmington, NC. This breaks the previous record of 21.12 inches set in July 1886. These rains combined with saturated ground from previous rain events, including Hurricane Dennis, to produce an inland flood disaster. There were 74 deaths in the United States, including 52 in North Carolina, due to drowning from flood waters. This makes Floyd the deadliest U.S. hurricane since Agnes in 1972. Data from the USGS indicate that eleven of their stream gage monitoring sites in North Carolina (Ahoskie, Rocky Mount, Hilliardston, White Oak, Enfield, Tarboro, Lucama, Hookerton, Trenton, Chinquapin, and Freeland) exceeded 0.2% annual chance flood levels due to Floyd. Total losses in North Carolina approach $5 billion with an estimated $3.5 billion in damages to North Carolina homes, businesses, roads, and infrastructure. Floyd passed relatively close to the entire U.S. east coast, justifying hurricane warnings from Florida to Massachusetts and requiring an estimated two million people to evacuate. The last hurricane to require warnings for as large a stretch of coastline was Hurricane Donna in 1960.

Hurricane Bonnie

(8/26/1998)

The landfall location of Bonnie was in southern North Carolina near Cape Fear very close to landfall of both Hurricanes Bertha and Fran in 1996. Even though a powerful storm, damage from Bonnie was much less than Fran, which was also Category 3. Winds gusted up to 100 knots and storm tides of 5 to 8 feet above normal were reported mainly in eastern beaches of Brunswick County, while a storm surge of 6 feet was reported at Pasquotank and Camden Counties in the Albemarle Sound.

Hurricane Fran

(9/5/1996)

The landfall location of Fran near the city of Wilmington and its progression into the Raleigh-Durham area caused an estimated $1.275 billion in damage in North Carolina alone. Fran hit with gusts up to 105 mph and a storm surge of approximately 16 feet. Over $1 billion in damage was reported in North Topsail Beach and Surf City and 23 people were killed.

Hurricane Bertha

(7/12/1996)
1996 was a damaging year in the hurricane history of North Carolina. Tropical Storm Arthur, Hurricane Bertha, and Hurricane Fran all made direct landfall on the North Carolina coastline. It was the most active tropical cyclone season in the state since 1955, when Hurricanes Connie, Diane, and Ione all hit the coast. Bertha entered North Carolina in North Topsail Beach with 105 mph gust and a storm surge of approximately 5 feet.

Hurricane Gloria
(9/26/1985)
The landfall location of Gloria was Cape Hatteras, with 90 knot winds and a storm surge of approximately 6-8 feet.

Hurricane Diana
(9/13/1984)
The landfall location of Diana was 38 miles south of Wilmington with 90 mph winds at its closest approach to Wilmington. Diana had 115 mph sustained winds before landfall. Storm surge was approximately 5-6 feet.

Table 5, “Historic Flood Elevations”, lists selected flooding sources in Franklin County with records of past stages. The table shows the historic peak, a location description, approximate stream station, the date of the historic peak, and approximate recurrence interval of the flood elevation. The approximate recurrence interval for a flood is often estimated based on an analysis of rainfall amounts from a storm and /or stream gage data.

Table 5 - Historic Flood Elevations

Flooding Source/Tropical Storm	Location Description	Approx. Stream Station	Historic Peak (Feet NAVD 88)	Date	Approximate Recurrence Interval (in years)
Buffalo Creek Tributary 1 / Unknown storm	Tollie Weldon Road station	6094	325.0	9/1/1999	100
Little River / Hurricane Floyd	Just upstream of Zebulon Road	416200	307.0	9/1/1996	100
Little River / Hurricane Floyd	4811 NC 231, Zebulon	334089	202.8	9/1/1999	100
Little River / Hurricane Floyd	Approximately 0.3 mile downstream of Wheeler Creek	366000	229.5	9/1/1999	100
Little River / Hurricane Floyd	Upstream of Highway 98	457531	342.4	9/1/1999	100
Little River / Hurricane Fran	Just upstream of State Highway 97	372000	236.1	9/1/1996	100
Moccasin Creek / Hurricane Floyd	Downstream of Pearces Road	111461	262.2	9/1/1999	100
Richland Creek / Hurricane Floyd	Approximately 900 feet downstream of West Stadium Drive	24330	260.2	9/1/1999	100
Tar River / Unknown storm	Princeville	*	33.0	7/1/1919	100
Tar River / Unknown storm	Tarboro - U.S. Weather Bureau Stream Gage	*	43.4	7/1/1919	100
Tar River / Unknown storm	Upstream face of Enon Road, Oxford	952391	392.2	9/1/1996	100
Tar River / Unknown storm	Upstream face of Goochs Mill Road	960799	402.5	9/1/1996	100
Tar River / Unknown storm	Upstream face of Tar River Dam, 5109 Goochs Mill Road, Oxford	961210	405.3	9/1/1996	100
Tar River / Unknown storm	Upstream face of Moriah Road	980814	427.3	9/1/1996	100
Tar River / Unknown storm	Unknown	182350	39.4	9/1/1999	500

* Data Not Available

4.4 Flood Protection Measures

Flood protection measures may be structural (such as levees, dams, and reservoirs) or non-structural (such as land-use management ordinances, policies, or practices).

Table 6, “Non-Levee Flood Protection Measures” is not applicable in Franklin County.

Table 7, “Levees” is not applicable in Franklin County.

4.5 Scope of Study

For this map maintenance revision, a scoping meeting was held in Franklin County to present the results of initial research to the county and communities within the county and to discuss their floodplain mapping needs. The county and communities were asked to provide input on proposed study priorities and analysis methods. These meetings resulted in the identification of flooding sources having a floodplain mapping need. Map Maintenance Plans were developed based on the results of the scoping meetings and were both mailed to each jurisdiction within Franklin County and posted to the State's website at www.ncfloodmaps.com.

Draft basin plans were developed based on the results of the initial scoping meetings. Final scoping meetings were held by the State and FEMA to provide counties and communities an overview of the draft basin plans, including the proposed scope and schedule for the project, and to provide an opportunity for additional county and community input. After the final scoping meeting was held, the Final Basin Plans were produced.

This FIS covers the geographic area of Franklin County, North Carolina, and all jurisdictions therein. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction. Limits of detailed study are indicated on the Flood Profiles and/or Water-surface elevation rasters and/or the FIRM.

Table 8P, "Scope of Revisions: Revised or New Detailed Study -Preliminary", lists flooding sources that were newly studied by detailed methods or were previously studied by detailed methods and had a change in backwater elevation due to flooding effects from a newly studied flooding source.

Table 8P - Scope of Revisions: Revised or New Detailed Study - Preliminary

Source	Riverine Sources		Affected Communties
	From	To	
Horse Creek	At the confluence with Falls Lake	Approximately 0.5 mile upstream of Purnell Road	Town Of Wake Forest

Table 9P, "Scope of Revisions: Redelineated - Preliminary" is not applicable in Franklin County.

Table 10P, "Scope of Revisions: Limited Detailed - Preliminary" is not applicable in Franklin County.

Table 8, "Flooding Sources Studied by Detailed Methods", lists all flooding sources within the county that were studied by detailed methods for this FIS and previous FISs.

Table 8 - Flooding Sources Studied by Detailed Methods: Revised or Newly Studied

Source	Riverine Sources		Affected Communties
	From	To	
Horse Creek	At the confluence with Falls Lake	Approximately 0.5 mile upstream of Purnell Road	Town Of Wake Forest
Moccasin Creek	Approximately 400 feet downstream of U.S. Highway 264A	Approximately 0.7 mile upstream of Henry Baker Road	Franklin County
Richland Creek	The confluence with Neuse River (Basin 15, Stream 1)	The Wake/Franklin County boundary	Town Of Wake Forest
Tar River	Approximately 0.5 mile downstream of the confluence of Sapony Creek	Approximately 80 feet upstream of the confluence of Fork Creek	Franklin County Town Of Bunn Town Of Louisburg

Table 9, "Flooding Sources Studied by Detailed Methods: Redelineated" is not applicable in Franklin County.

Table 10, "Flooding Sources Studied by Detailed Methods: Limited Detailed", lists all flooding sources within the county that were studied by limited detailed methods for either this FIS or previous FISs.

Table 10 - Flooding Sources Studied by Detailed Methods: Limited Detailed

Source	Riverine Sources		Affected Communties
	From	To	
Basin 10, Stream 14	The confluence with Little River (Basin 10, Stream 1)	Approximately 1.4 miles upstream of the Franklin/Wake county boundary	Franklin County
Billys Creek	Approximately 1.1 miles upstream of Montgomery Road (SR 1210)	Approximately 2.5 miles upstream of Montgomery Road (SR 1210)	Franklin County
Billys Creek	Confluence with the Tar River	Approximately 1.1 miles upstream of Montgomery Road (SR 1210)	Franklin County
Buffalo Creek	Confluence with Sandy Creek	Approximately 2.5 miles upstream of U.S. Highway 401 crossing	Franklin County
Buffalo Creek Tributary 1	Confluence with Buffalo Creek	Approximately 700 feet upstream of Tollie Weldon Road crossing	Franklin County

Table 10 - Flooding Sources Studied by Detailed Methods: Limited Detailed

Source	Riverine Sources		Affected Communties
	From	To	
Cedar Creek	Approximately 1.0 mile upstream of Pocomoke Road	Approximately 1.3 mile upstream of Pocomoke Road	Franklin County
Cedar Creek	Confluence with the Tar River	Approximately 1.0 mile upstream of Pocomoke Road	Franklin County Town Of Franklinton
Devils Cradle Creek	Confluence with Sandy Creek	Approximately 1.7 miles upstream of Highway 39 crossing	Franklin County
Flatrock Creek	Confluence with Devils Cradle Creek	Approximately 4.0 miles upstream of U.S. Highway 401 crossing	Franklin County
Fork Creek	The confluence with Tar River	Approximately 0.1 mile upstream of State Route 56	Franklin County
Giles Creek	Confluence with Tooles Creek	Approximately 0.8 mile upstream of the confluence with Tooles Creek	Franklin County
Hattles Branch	Confluence with Richland Creek	Approximately 0.9 mile upstream of Youngsville Boulevard	Town Of Youngsville
Horse Creek	Approximately 0.5 mile upstream of Purnell Road	Approximately 225 feet upstream of Nottingham Court	Franklin County
Horse Creek Tributary 1	The confluence with Horse Creek	Approximately 1.0 mile upstream of Holden Road (SR 1147)	Franklin County
Little River	Approximately 300 feet upstream of confluence of Perry Creek (Basin 10, Stream 19)	Approximately 900 feet upstream of Martindale Drive	Franklin County Town Of Youngsville
Little River Tributary 1	The confluence with Little River	Approximately 0.4 mile upstream of the confluence with Little River	Franklin County
Little River Tributary 2	The confluence with Little River	Approximately 300 feet upstream of Williamston Ridge Drive	Franklin County
Little River Tributary 3	The confluence with Little River	Approximately 0.3 mile upstream of NC Highway 98	Franklin County
Little River Tributary 3A	The confluence with Little River Tributary 3	Approximately 0.4 mile upstream of the confluence with Little River Tributary 3	Franklin County
Little River Tributary 3B	The confluence with Little River Tributary 3A	Approximately 250 feet upstream of NC Highway 98	Franklin County
Little River Tributary 8	The confluence with Little River	Approximately 560 feet upstream of Oak Grove Church Road	Franklin County
Lynch Creek	Confluence with the Tar River	Approximately 0.69 mile upstream of Gillburg Road	Franklin County
Middle Creek	The confluence with the Tar River	Approximately 1.9 miles upstream of Green Hill Road (SR 1203)	Franklin County
Moccasin Creek Tributary 3	Confluence with Moccasin Creek	Approximately 0.4 mile upstream of Old Halifax Road	Franklin County
Norris Creek	Confluence with Crooked Creek	Approximately 450 feet upstream of Bethlehem Church Road	Franklin County
Richland Creek	The Franklin/Wake County boundary	Approximately 0.3 mile upstream of Holden Road	Town Of Wake Forest Town Of Youngsville
Richland Creek Tributary 2	The confluence with Richland Creek	Approximately 0.4 mile upstream of the confluence with Richland Creek	Town Of Wake Forest
Sandy Creek	Confluence with Swift Creek	Approximately 0.25 mile upstream of US Highway 1 Bypass	Franklin County
Smith Creek	The Franklin/Wake County boundary	Approximately 0.6 mile upstream of the Franklin/Wake County boundary	Franklin County
Taylors Creek	Approximately 1.6 miles upstream of the confluence with Tar River	Approximately 237 feet upstream of West Green Street	Franklin County Town Of Franklinton
Taylors Creek	The confluence with Tar River	Approximately 1.6 miles upstream of the confluence with the Tar River	Franklin County
Tooles Creek	Confluence with Lynch Creek	Approximately 1.4 miles upstream of Rocky Ford Road crossing	Franklin County

Table 11, “Stream Name Changes” is not applicable in Franklin County.

Table 12, “Letters of Map Revision” is not applicable in Franklin County.

5.0 Engineering Methods

For the flooding sources in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded at least once on the average during any 10-, 25-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 25-, 50-, 100-, and 500-year floods, have a 10-, 4-

, 2-, 1-, and 0.2% annual chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedance) during the term of a 30-year mortgage is approximately 26 percent (about 3 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

5.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak elevation-frequency relationships for floods of the selected recurrence intervals for each flooding source studied. Hydrologic analyses are typically performed at the watershed level. Depending on factors such as watershed size and shape, land use and urbanization, and natural or man-made storage, various models or methodologies may be applied. For details on the county's hydrologic analyses, the hydrologic report is available by request.

A summary of the drainage area-peak discharge relationships for the flooding sources studied by detailed methods is shown in Table 13, "Summary of Discharges".

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Basin 10, Stream 14					
Approximately 0.16 mile upstream of the Franklin/ Wake County Boundary	1.17	*	*	821	*
Approximately 1.2 miles upstream of Halifax Road	1.17	901	1560	1848	2661
Approximately 1.3 miles upstream of Halifax Road	0.70	*	*	1380	*
Approximately 1.9 miles upstream of Halifax Road	0.13	212	389	471	709
Billys Creek					
Confluence with the Tar River	6.87	1197	2048	2486	3724
Approximately 1.1 miles upstream of Montgomery Road	4.00	836	1451	1771	2683
Buffalo Creek					
Confluence of Buffalo Creek Tributary 1	2.89	*	*	1440	*
Approximately 0.8 mile upstream of U.S. Highway 401	1.14	*	*	809	*
Buffalo Creek Tributary 1					
Confluence with Buffalo Creek	1.62	*	*	1010	*
Tollie Weldon Road	0.91	*	*	701	*
Devils Cradle Creek					
Approximately 1.8 miles upstream of N.C. Highway 39	1.11	*	*	794	*
Flatrock Creek					
Approximately 1.9 miles upstream of U.S. Highway 401	2.13	*	*	1190	*
Approximately 0.5 mile downstream of Henry Ayscue Road	1.05	*	*	770	*
Fork Creek					
At the confluence with the Tar River	10.67	*	*	3270	*
Giles Creek					
Confluence with Tooles Creek	3.76	*	*	1710	*
Approximately 0.8 mile upstream of the confluence with Tooles Creek	3.31	*	*	1570	*
Hattles Branch					

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Confluence with Richland Creek	1.83	*	*	1090	*
Approximately 500 feet upstream of U.S. Route 1AH	1.35	*	*	900	*
Horse Creek					
Approximately 286 feet upstream of Holden Road	4.69	*	*	1960	*
Approximately 204 feet downstream of John Mitchell Road	1.20	376	674	833	1292
Approximately 337 feet upstream of John Mitchell Road	0.84	297	538	667	1042
Approximately 0.4 mile upstream of John Mitchell Road	0.65	252	460	571	897
Horse Creek Tributary 1					
Approximately 0.4 mile upstream of Keighley Forrest Drive	1.17	370	664	820	1273
Approximately 782 feet downstream of Holden Road	1.03	340	613	758	1180
Approximately 0.4 mile upstream of Holden Road	0.59	235	429	534	840
Little Creek					
Approximately 179 feet upstream of U.S. Highway 264A	2.51	614	1080	1325	2025
Approximately 381 feet downstream of U.S. Highway 264	2.07	541	956	1174	1802
Approximately 0.7 mile upstream of U.S. Highway 264	1.80	493	875	1077	1657
Approximately 1.0 mile upstream of U.S. Highway 264	1.50	437	779	960	1483
Approximately 0.4 mile downstream of Debnam Road (SR 1142)	1.25	387	693	856	1326
Approximately 211 feet downstream of Debnam Road (SR 1142)	1.00	335	604	747	1163
Approximately 911 feet upstream of Debnam Road (SR 1142)	0.58	232	425	529	833
Little River					
Approximately 0.93 mile upstream of the Franklin/Wake County boundary	12.93	*	*	3690	*
Approximately 1.14 miles upstream of the Franklin/Wake County boundary	12.00	*	*	3520	*
Approximately 1.0 mile downstream of U.S. Highway 401	11.84	*	*	3490	*
Approximately 0.20 mile upstream of U.S. Highway 401	9.32	*	*	3010	*
Approximately 0.37 mile upstream of U.S. Highway 96	8.34	*	*	2810	*
Approximately 0.36 mile upstream of U.S. Highway 96	7.29	*	*	2580	*
Approximately 0.74 mile downstream of Moores Pond Road	6.87	*	*	2480	*
Approximately 0.34 mile upstream of Moores Pond Road	4.26	*	*	1840	*
Approximately 1.04 miles upstream of Moores Pond Road	3.49	*	*	1630	*
Approximately 1.35 miles upstream of Moores Pond Road	2.74	*	*	1400	*
Approximately 2.1 miles upstream of Moores Pond Road	2.06	*	*	1170	*
Little River Tributary 1					
The confluence with Little River	0.70	264	481	597	936
Approximately 0.3 mile upstream of the confluence with Little River	0.58	234	427	532	837
Little River Tributary 2					
The confluence with Little River	0.88	308	557	690	1077
Little River Tributary 3					
The confluence with Little River	2.52	616	1083	1328	2029
The confluence of Little River Tributary 3A	0.70	264	481	597	937
Approximately 40 feet downstream of U.S. Highway 401	0.60	238	436	542	852
Approximately 0.2 mile upstream of N.C. Highway 98	0.46	200	367	458	724
Little River Tributary 3A					
The confluence with Little River Tributary 3	0.54	222	407	506	798

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Little River Tributary 3B					
The confluence with Little River Tributary 3A	0.91	315	569	704	1099
Approximately 613 feet downstream of N.C. Highway 98	0.84	297	538	667	1042
Approximately 250 feet upstream of N.C. Highway 98	0.38	176	326	407	647
Little River Tributary 8					
The confluence with Little River	0.55	224	410	510	804
Lynch Creek					
Approximately 0.1 mile upstream of Rocky Ford Road	15.80	*	*	4180	*
Approximately 1.1 miles upstream of Rocky Ford Road	14.80	*	*	4010	*
Approximately 1.7 miles upstream of Rocky Ford Road	6.19	*	*	2330	*
Approximately 0.2 mile downstream of the Vance and Franklin County lines	5.81	*	*	2240	*
Approximately 0.2 mile downstream of Franklin/Vance County Boundary	5.19	*	*	2090	*
Middle Creek					
Confluence with the Tar River	9.04	*	*	2950	*
Approximately 1.5 miles upstream of the confluence with the Tar River	7.94	*	*	2720	*
Moccasin Creek					
Approximately 0.41 mile upstream of the Franklin/Nash County boundary	27.96	*	*	7470	*
Approximately 0.8 mile upstream of NC 97	20.10	*	*	6070	*
Approximately 0.81 mile upstream of Highway 97	20.10	*	*	6070	*
Approximately 1,580 feet upstream of US Highway 64	13.95	*	*	4840	*
Approximately 0.29 mile upstream of U.S. Highway 64	13.95	*	*	4840	*
Approximately 0.24 mile downstream of Williams-White Road	10.54	*	*	4060	*
Approximately 1,060 feet downstream of Williams-White Road	10.54	*	*	4060	*
Approximately 0.6 mile downstream of Pearces Road	8.19	*	*	3470	*
Approximately 0.62 mile downstream of Pearces Road	8.19	*	*	3470	*
Approximately 0.12 mile downstream of Henry Baker Road	2.05	*	*	1520	*
Approximately 530 feet downstream of Henry Baker Road	2.05	*	*	1520	*
Moccasin Creek Tributary 3					
Confluence with Moccasin Creek	3.74	*	*	1699	*
Approximately 0.32 mile upstream of confluence with Moccasin Creek	3.56	*	*	1650	*
Approximately 0.18 mile downstream of Henry Baker Road	3.11	*	*	1510	*
Approximately 0.19 mile upstream of Henry Baker Road	2.93	*	*	1460	*
Approximately 0.18 mile downstream of Pilot-Riley Road	2.59	*	*	1350	*
Approximately 188 feet upstream of Pilot-Riley Road	2.28	*	*	1250	*
Approximately 0.38 mile upstream of Pilot-Riley Road	1.94	*	*	1130	*
Approximately 0.71 mile upstream of Pilot-Riley Road	1.76	*	*	1060	*
Approximately 0.77 mile downstream of Horace Baker Road	1.41	*	*	924	*
Approximately 0.40 mile downstream of Horace Baker Road	1.02	*	*	755	*
Approximately 0.15 mile downstream of Old Halifax Road	0.37	*	*	397	*
Richland Creek					
Approximately 0.7 mile downstream of Holden Road	1.51	762	1337	1590	2310
Approximately 20 feet upstream of Holden Road	1.05	649	1143	1360	1975
Approximately 0.2 mile upstream of Holden Road	0.59	443	793	949	1394

Table 13 - Summary of Discharges

Flooding Source		Discharges (cfs)			
Location	Drainage Area (square miles)	10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Smith Creek					
Approximately 0.2 mile upstream of the Franklin\Wake County boundary	1.00	334	602	745	1160
Tar River					
Approximately 240 feet upstream of the confluence of Billys Creek	352.81	12733	20439	24472	35738
Approximately 1.7 miles upstream of the confluence of Billys Creek	341.63	12723	20373	24355	35435
Approximately 810 feet upstream of U.S. Highway 1	265.40	12642	19863	23458	33143
Approximately 120 feet upstream of the confluence of Taylors Creek	255.79	12630	19789	23330	32822
Approximately 1.5 miles downstream of Green Hill Road (SR 1203)	244.74	12616	19702	23177	32440
Taylors Creek					
Approximately 0.8 mile upstream of the confluence with Tar River	8.80	*	*	2900	*
Approximately 1.5 miles upstream of the confluence with Tar River	7.84	1306	2226	2698	4032
Approximately 1.7 miles upstream of the confluence with Tar River	5.55	1038	1787	2174	3270
Tooles Creek					
Confluence of Giles Creek	5.10	*	*	2060	*
Approximately 1.1 miles downstream of Joe Ward Road	2.69	*	*	1380	*
Joe Ward Road	1.14	*	*	811	*

Table 14, “Summary of Stillwater Elevations” is not applicable in Franklin County.

Table 15, “Gage Information” is not applicable in Franklin County.

5.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the flood elevations for the selected recurrence intervals. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles and/or Water-surface elevation rasters. For stream segments for which BFEs were computed, selected cross-section locations are also shown on the FIRM. Flood Profiles and/or Water-surface elevation rasters were developed showing computed water-surface elevations for floods of the selected recurrence intervals.

Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles and/or Water-surface elevation rasters or in the Floodway Data tables in the FIS Report. For construction and/or floodplain management purposes, users are encouraged to use the flood elevation data presented in the FIS in conjunction with the data shown on the FIRM.

The hydraulic analyses for this FIS were based on unobstructed flow. The flood elevations shown on the Flood Profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

For details on the county’s hydraulic analyses, the hydraulic report is available by request.

For the streams studied by detailed methods, water surface elevations of floods of the selected recurrence intervals were computed through use of the Army Corps of Engineers' HEC RAS step backwater computer program . The hydraulic analyses were based on unobstructed flow. The flood elevations shown on the Profiles and/or Water-surface elevation rasters are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail. The computer models were calibrated using historic high water data collected during field investigations.

The cross section geometries were obtained from a combination of digital elevation data obtained by Light Detection and Ranging (LIDAR) and field surveys. All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry. Natural floodplain cross sections were surveyed approximately every 4000 feet along the detail study reaches to obtain the channel geometry between bridges and culverts. Overbank cross section data for the backwater analyses were obtained from recently flown LIDAR data.

Channel roughness factors (Manning's "n") used in the hydraulic computations were made in the field by an engineer where stream access was possible, with orthophotos used to supplement areas that could not be accessed. The channel and overbank "n" values for all of the streams studied by detailed methods are shown in Table 16, "Roughness Coefficients".

Table 16 - Roughness Coefficients

Stream	Channel "n"	Overbank "n"
Basin 10, Stream 14	0.035 to 0.050	0.080 to 0.150
Billys Creek	0.048 to 0.055	0.080 to 1.000
Buffalo Creek	0.043	0.110
Buffalo Creek Tributary 1	0.045	0.120
Cedar Creek	0.050 to 0.055	0.110 to 1.000
Devils Cradle Creek	0.041 to 0.049	0.110 to 0.150
Flatrock Creek	0.048	0.140 to 1.000
Fork Creek	0.055	0.131 to 0.150
Giles Creek	0.050	0.040 to 0.130
Hattles Branch	0.046 to 0.047	0.140 to 0.150
Horse Creek	0.032 to 0.055	0.060 to 0.150
Horse Creek Tributary 1	0.048	0.120 to 0.150
Little River	0.040 to 0.066	0.070 to 0.240
Little River Tributary 1	0.035 to 0.040	0.060 to 0.140
Little River Tributary 2	0.048	0.080 to 0.150
Little River Tributary 3	0.035 to 0.045	0.035 to 0.150
Little River Tributary 3A	0.050	0.070 to 0.150
Little River Tributary 3B	0.035 to 0.045	0.035 to 0.150
Little River Tributary 8	0.045	0.120 to 0.150
Lynch Creek	0.050 to 0.055	0.120 to 1.000
Middle Creek	0.055	0.130 to 0.150
Moccasin Creek	0.030 to 0.070	0.070 to 0.220
Moccasin Creek Tributary 3	0.047	0.130
Norris Creek	0.050 to 0.055	0.130 to 1.000
Richland Creek	0.035 to 0.070	0.035 to 0.200
Richland Creek Tributary 2	0.050	0.070 to 0.130
Sandy Creek	0.042 to 0.050	0.080 to 0.168
Smith Creek	0.032 to 0.050	0.080 to 0.150
Tar River	0.020 to 0.080	0.030 to 1.000
Taylors Creek	0.050	0.040 to 0.150
Tooles Creek	0.050 to 0.055	0.130 to 1.000

For flooding sources studied by limited detailed methods in the county, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this report and the FIRM panels. This method entails developing a HEC-RAS hydraulic model, resulting in the calculation of BFEs and the delineation of the 1% annual chance floodplain (designated as Zone AE). Cross sections for the flooding sources studied by limited detailed methods were obtained using digital elevation data obtained with LIDAR technology developed as part of the North Carolina Statewide Floodplain Mapping Program. The hydraulic model is prepared using this digital elevation data, without surveying bathymetric or structural data. Where bridge or culvert data are readily available, such as from the North Carolina Department of Transportation, these data have been reflected in the hydraulic model. If these structural data are not readily available, field measurements of these structures were made to approximate their geometry in the hydraulic models. In addition, this method does not include field surveys that determine specifics on channel and floodplain characteristics. A limited detailed study is a "buildable" product that can be upgraded to a fully detailed study at a later date by verifying stream channel characteristics, bridge and culvert opening geometry, and by analyzing multiple recurrence intervals.

The results of the HEC-RAS computations are tabulated for all cross sections (Table 17, "Limited Detailed Flood Hazard Data"). Flood Profiles have not been developed for streams studied by limited detailed methods. Water-surface elevation rasters were developed for steams studied by limited detailed methods. In addition, floodways for streams studied by limited detailed methods are not delineated on the FIRM. However, the 1% annual chance water-surface elevations, flood discharges, and non-encroachment widths from the limited detailed studies for every modeled cross section are given in Table 17. The non-encroachment widths given at modeled cross sections can be used by communities to enforce floodplain management ordinances that meet the requirement defined in 44 CFR 60.3(c)(10).

Between cross sections for streams studied by limited detailed methods, 1% annual chance water-surface elevations can be calculated by mathematical interpolation using the distance along the stream centerline. Non-encroachment widths and, therefore, the location of a non-encroachment area boundary between cross sections should be determined based on either 1) mathematical interpolation, or 2) the non-encroachment width at the upstream or downstream cross section, whichever is larger. If the width determined by this second method is wider than the Special Flood Hazard Area (SFHA) or the 1% annual chance floodplain delineated on the FIRM for this location along the stream, the non-encroachment area shall be considered to be coincident with the SFHA. A full detailed study incorporating field survey data in the HEC-RAS hydraulic model may be submitted for a Letter of Map Revision (LOMR) request to map a regulatory floodway along a section of a stream in lieu of applying the non-encroachment widths listed in Table 17.

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Basin 10, Stream 14				
138	13,799	2,432	307.1	13 / 180
141	14,126	2,432	309.5	7 / 125
144	14,409	2,432	318.6	35 / 150
150	15,011	1,848	323.8	80 / 40
155	15,451	1,848	325.9	125 / 10
161	16,085	1,848	330.4	70 / 20
166	16,553	1,848	334.3	55 / 55
172	17,236	1,848	340.1	60 / 55
178	17,794	1,848	344.9	70 / 55
183	18,293	471	347.7	35 / 15
186	18,608	471	351.4	10 / 10
189	18,869	471	357.3	25 / 10
190	18,990	471	359.3	55 / 65
192	19,168	471	359.3	55 / 90
194	19,350	471	360.1	25 / 40
196	19,621	471	364.5	30 / 10
197	19,730	471	371.3	220 / 115
199	19,943	471	371.3	190 / 225
203	20,250	471	371.3	100 / 25
204	20,368	471	374.1	235 / 8
205	20,452	471	379.9	238 / 100
207	20,695	471	379.9	96 / 128
211	21,066	471	386.6	10 / 40
Billys Creek				
005	498	2,518	225.4[1]	73 / 100
010	998	2,518	225.4[1]	225 / 85
015	1,498	2,518	225.4[1]	206 / 109
020	1,997	2,518	225.4[1]	254 / 130
025	2,497	2,518	225.4[1]	88 / 260
030	2,997	2,518	225.4[1]	75 / 165
035	3,497	2,414	225.4[1]	106 / 124
041	4,120	2,414	225.4[1]	139 / 52
043	4,299	2,414	225.4[1]	70 / 51
043	4,344	2,414	225.4[1]	70 / 51
050	4,998	2,414	225.4[1]	33 / 99
055	5,498	2,414	227.0	96 / 85

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
060	5,998	2,414	228.4	255 / 67
065	6,499	2,414	228.9	30 / 112
070	6,998	2,030	232.4	102 / 72
075	7,498	2,030	233.6	162 / 114
080	7,998	2,030	235.2	118 / 76
085	8,499	1,941	237.1	137 / 26
090	8,999	1,941	238.8	192 / 28
095	9,499	1,941	240.6	252 / 110
100	9,999	1,941	242.5	205 / 48
100	10,000	1,941	242.5	205 / 48
105	10,500	1,771	245.2	70 / 20
110	11,000	1,771	248.7	24 / 111
115	11,500	1,771	249.8	36 / 174
120	12,000	1,771	251.0	96 / 11
Buffalo Creek				
006	556	2,190	271.4[1]	77 / 254
015	1,475	2,190	271.4[1]	46 / 248
018	1,834	2,190	271.6	21 / 89
025	2,500	2,190	274.5	249 / 17
029	2,939	2,190	275.5	169 / 73
035	3,540	2,190	276.6	252 / 139
040	3,998	2,190	277.6	17 / 320
044	4,355	2,190	283.1	26 / 110
050	4,999	1,440	283.4	184 / 146
057	5,697	1,440	283.7	65 / 52
066	6,576	1,440	285.5	26 / 235
075	7,500	1,440	287.5	14 / 253
081	8,092	1,440	290.0	14 / 291
088	8,761	1,440	293.0	28 / 169
096	9,587	1,440	296.2	152 / 26
104	10,424	1,240	300.5	36 / 13
111	11,059	1,240	302.6	221 / 40
120	12,003	1,240	306.1	42 / 13
126	12,581	1,240	311.5	70 / 100
135	13,467	1,240	316.4	96 / 75
140	14,034	1,240	318.7	96 / 38
147	14,684	1,240	324.4	57 / 42
155	15,506	1,240	327.5	10 / 145
163	16,344	1,240	332.7	56 / 14
170	16,981	809	337.3	49 / 12
176	17,637	809	346.4	13 / 12
181	18,088	809	354.8	45 / 12
Buffalo Creek Tributary 1				
006	608	1,010	284.9	12 / 120
011	1,100	1,010	286.5	173 / 12

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
016	1,638	1,010	288.7	130 / 12
020	2,011	1,010	291.7	12 / 183
027	2,659	1,010	295.4	23 / 12
034	3,383	1,010	300.6	12 / 142
040	4,041	1,010	303.3	12 / 83
046	4,591	871	308.0	45 / 33
053	5,331	871	313.1	12 / 133
060	6,019	871	319.2	6 / 60
062	6,175	871	326.6	12 / 100
069	6,881	701	326.8	14 / 92
Cedar Creek				
1110	111,017	487	427.0	16 / 22
1110	111,018	649	427.0	16 / 22
1112	111,246	487	430.0	13 / 13
1115	111,516	487	432.8	16 / 24
1118	111,806	487	435.3	16 / 14
1121	112,054	487	438.0	26 / 8
Devils Cradle Creek				
405	40,513	1,350	362.3	49 / 106
415	41,455	1,020	365.5	166 / 3
419	41,943	1,020	367.3	150 / 5
426	42,592	1,020	369.8	73 / 35
431	43,089	1,020	371.7	143 / 12
435	43,458	1,020	372.9	170 / 12
445	44,460	794	378.5	12 / 41
Flatrock Creek				
213	21,285	1,440	329.5	14 / 14
220	21,961	1,440	340.5	15 / 100
227	22,691	1,440	341.2	28 / 101
235	23,524	1,440	348.0	80 / 45
244	24,400	1,440	352.5	14 / 141
252	25,222	1,440	353.6	85 / 154
258	25,791	1,440	354.4	201 / 16
264	26,368	1,190	358.0	44 / 13
270	26,960	1,190	364.5	29 / 13
277	27,651	1,190	368.7	14 / 55
280	27,975	1,190	370.2	13 / 37
288	28,838	1,190	373.6	13 / 181
295	29,534	1,190	374.8	13 / 166
300	30,048	1,190	376.6	114 / 27
305	30,516	1,190	379.7	31 / 34
312	31,202	1,190	382.6	39 / 71
321	32,103	1,190	384.0	195 / 13
326	32,624	1,190	384.9	11 / 135
336	33,593	1,190	388.7	13 / 146
342	34,215	884	391.3	12 / 108

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
348	34,845	884	394.2	44 / 66
353	35,344	884	395.5	82 / 94
361	36,100	770	398.0	14 / 14
Fork Creek				
005	501	3,315	244.6[1]	31 / 220
010	1,002	3,315	244.6[1]	19 / 40
Giles Creek				
005	500	1,735	238.5	36 / 77
010	1,003	1,735	239.6	11 / 205
015	1,502	1,735	241.1	35 / 69
020	2,002	1,735	243.9	118 / 92
025	2,503	1,638	245.9	34 / 103
030	3,005	1,638	248.1	128 / 30
035	3,506	1,638	250.0	59 / 140
040	4,008	1,638	251.4	57 / 36
045	4,509	1,602	253.6	18 / 49
Hattles Branch				
027	2,652	1,088	338.2	25 / 30
039	3,870	900	347.0	16 / 40
043	4,329	900	350.9	119 / 16
048	4,784	900	352.8	35 / 2
053	5,283	900	357.5	25 / 4
058	5,838	900	362.9	104 / 12
065	6,505	900	370.7	18 / 7
069	6,927	900	384.2	107 / 107
075	7,453	900	391.2	6 / 64
079	7,875	900	395.7	84 / 4
Horse Creek Tributary 1				
004	412	900	340.5[1]	37 / 56
005	540	900	344.2	49 / 51
008	796	900	344.4	100 / 99
011	1,124	900	344.7	92 / 113
016	1,635	900	347.6	49 / 92
021	2,089	900	351.2	188 / 12
025	2,496	900	353.5	73 / 51
031	3,083	820	357.4	126 / 12
035	3,548	820	359.9	117 / 12
040	3,975	820	363.1	114 / 12
045	4,517	758	367.4	78 / 17
049	4,852	758	370.2	43 / 49
052	5,181	758	371.2	27 / 20
053	5,262	758	371.7	27 / 21
054	5,355	758	374.0	20 / 46
057	5,660	758	378.5	63 / 12
060	5,997	758	381.0	74 / 12
065	6,519	758	385.2	48 / 12

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
Little River				
4249	424,949	3,985	324.6	311 / 38
4254	425,385	3,985	324.8	63 / 82
4259	425,949	3,985	326.1	77 / 64
4264	426,364	3,985	326.8	211 / 93
4274	427,449	3,864	327.4	107 / 224
4279	427,949	3,864	327.6	124 / 478
4287	428,722	3,864	327.8	112 / 424
4293	429,287	3,864	328.0	283 / 415
Little River Tributary 1				
005	494	597	327.2[1]	120 / 20
011	1,063	597	327.2[1]	10 / 85
014	1,355	532	328.6	10 / 125
016	1,566	532	335.0	75 / 220
018	1,772	532	335.0	50 / 115
022	2,226	532	338.1	45 / 10
Little River Tributary 2				
005	499	690	328.1[1]	15 / 69
010	1,000	690	330.5	63 / 57
015	1,476	690	333.8	45 / 20
020	2,000	690	340.3	9 / 23
Little River Tributary 3				
007	684	1,328	329.4[1]	60 / 300
016	1,648	1,328	329.4[1]	110 / 80
022	2,183	1,328	329.6	13 / 150
026	2,591	1,328	330.4	100 / 100
029	2,866	1,328	335.5	80 / 80
031	3,113	1,328	335.7	115 / 80
034	3,374	1,328	335.9	75 / 150
037	3,723	1,328	336.1	100 / 110
040	4,018	1,328	336.3	110 / 35
043	4,262	1,328	336.7	36 / 50
045	4,487	1,328	338.0	270 / 167
048	4,768	1,328	338.0	570 / 146
056	5,573	1,328	338.1	484 / 200
059	5,904	597	339.2	80 / 42
064	6,364	597	342.7	24 / 65
066	6,643	597	344.0	28 / 39
068	6,845	597	345.8	26 / 30
071	7,085	597	346.8	26 / 50
073	7,279	597	352.6	72 / 68
074	7,438	542	352.6	115 / 40
076	7,618	542	352.6	70 / 100
078	7,839	542	353.9	61 / 89
080	7,990	542	354.0	35 / 100
083	8,311	542	354.2	35 / 46

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
086	8,639	542	355.4	40 / 20
090	9,038	458	358.4	22 / 30
093	9,321	458	360.0	32 / 38
Little River Tributary 3A				
008	755	506	338.1[1]	45 / 90
011	1,143	506	340.8	60 / 47
013	1,331	506	342.4	30 / 75
015	1,461	506	343.2	13 / 100
015	1,532	506	343.5	26 / 90
017	1,651	506	346.2	7 / 58
018	1,802	506	347.4	60 / 25
020	1,989	506	348.4	50 / 25
021	2,139	506	350.2	35 / 20
Little River Tributary 3B				
003	253	704	338.1[1]	100 / 80
007	701	704	338.7	26 / 135
010	953	704	339.3	75 / 80
011	1,139	704	340.5	45 / 48
014	1,364	704	342.0	80 / 25
016	1,606	704	342.7	42 / 51
019	1,933	704	344.2	30 / 67
023	2,275	704	346.0	80 / 35
025	2,529	704	347.4	52 / 28
026	2,634	704	352.6	108 / 186
028	2,812	667	352.7	101 / 192
031	3,140	667	352.8	50 / 155
033	3,266	667	358.2	80 / 120
035	3,451	407	358.2	50 / 70
Little River Tributary 8				
003	332	510	370.8[1]	100 / 25
006	567	510	370.8	24 / 34
008	818	510	372.5	80 / 10
010	1,002	510	373.5	100 / 5
013	1,253	510	375.6	85 / 5
015	1,534	510	375.9	21 / 25
018	1,752	510	376.6	25 / 25
020	1,980	510	380.0	15 / 20
022	2,222	510	385.6	60 / 5
Lynch Creek				
154	15,438	5,293	222.9	338 / 70
160	16,000	5,293	223.8	462 / 65
165	16,500	5,293	224.3	197 / 55
169	16,892	5,293	225.5	222 / 120
175	17,500	5,147	226.6	373 / 111
180	17,997	5,147	227.4	203 / 47
185	18,497	5,147	228.8	94 / 162

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
190	18,997	5,147	230.0	36 / 163
195	19,496	5,147	231.2	36 / 162
200	19,995	5,147	232.4	77 / 53
210	20,994	4,574	234.3	233 / 79
215	21,494	4,574	234.8	201 / 50
220	21,992	4,574	235.8	122 / 105
225	22,491	4,574	237.0	31 / 159
230	22,992	4,574	238.1	110 / 80
235	23,490	4,574	239.2	95 / 60
240	23,989	4,574	252.1	53 / 27
245	24,487	4,574	259.4	26 / 42
250	24,987	4,483	263.6	15 / 29
255	25,487	4,483	265.4	18 / 30
260	25,987	4,483	266.9	39 / 21
265	26,488	4,483	268.8	31 / 24
270	26,988	4,483	271.0	55 / 23
275	27,542	4,483	273.9	28 / 37
280	27,987	4,483	276.2	36 / 17
282	28,235	4,483	277.2	35 / 23
290	28,988	4,483	279.8	45 / 24
295	29,543	4,483	281.4	30 / 39
300	29,991	4,483	282.7	28 / 31
305	30,490	4,483	284.2	32 / 58
310	30,988	4,483	285.1	49 / 35
315	31,486	4,483	286.2	72 / 57
320	31,986	4,483	286.7	72 / 16
325	32,484	4,256	287.6	27 / 33
330	32,980	4,256	290.8	32 / 46
336	33,602	4,256	293.0	23 / 38
340	34,016	4,256	297.0	51 / 44
345	34,484	4,256	299.2	79 / 22
350	34,982	4,230	300.3	73 / 108
355	35,483	4,230	300.8	29 / 160
360	35,982	4,230	301.5	70 / 128
365	36,481	4,230	302.2	207 / 89
370	36,980	4,230	302.6	52 / 369
375	37,479	4,230	302.9	28 / 206
380	37,977	4,230	303.6	18 / 134
385	38,477	4,230	304.6	34 / 182
390	38,977	4,230	305.5	36 / 95
395	39,476	4,230	307.2	31 / 132
400	39,976	4,230	308.1	32 / 175
405	40,478	4,062	308.8	70 / 301
410	40,977	4,062	309.1	93 / 433
415	41,479	4,062	309.4	37 / 346

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
420	41,980	4,062	309.8	54 / 274
436	43,567	2,364	312.5	98 / 21
440	43,977	2,364	314.5	23 / 61
445	44,477	2,364	316.0	55 / 118
450	44,977	2,364	316.7	220 / 40
455	45,477	2,364	316.6	20 / 14
460	45,977	2,364	320.7	80 / 120
465	46,477	2,272	322.6	24 / 169
470	46,977	2,272	323.8	37 / 150
475	47,477	2,272	325.4	43 / 48
480	47,977	2,272	327.4	73 / 8
484	48,364	2,272	328.4	75 / 136
490	48,978	2,272	328.8	286 / 101
494	49,414	2,272	329.1	62 / 223
500	49,979	2,119	329.7	49 / 283
505	50,478	2,119	330.5	37 / 235
510	50,978	2,119	332.4	41 / 229
Middle Creek				
005	501	2,991	241.3[1]	101 / 57
010	1,000	2,991	241.3[1]	44 / 228
014	1,427	2,991	241.3[1]	40 / 39
020	2,002	2,991	241.3[1]	331 / 34
025	2,501	2,991	241.3[1]	142 / 94
030	3,000	2,991	241.3[1]	259 / 42
035	3,502	2,991	241.3[1]	238 / 84
045	4,502	2,991	241.3[1]	198 / 35
050	5,002	2,991	241.3[1]	284 / 42
055	5,502	2,991	241.3[1]	26 / 85
060	6,000	2,838	241.3[1]	63 / 93
065	6,500	2,838	241.3[1]	64 / 25
070	6,999	2,838	242.2	117 / 99
075	7,499	2,838	243.3	100 / 70
080	7,999	2,838	245.0	66 / 40
085	8,498	2,759	247.8	67 / 125
090	8,997	2,759	249.3	52 / 112
095	9,497	2,759	251.0	27 / 134
100	9,997	2,759	252.4	167 / 69
105	10,498	2,759	253.8	131 / 60
110	10,998	2,759	255.5	195 / 33
115	11,498	2,759	257.0	139 / 48
Moccasin Creek Tributary 3				
006	557	1,699	269.0[1]	223 / 10
009	941	1,699	269.0[1]	137 / 10
012	1,210	1,699	269.0[1]	10 / 267
019	1,912	1,648	271.9	42 / 10

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
023	2,326	1,648	274.4	69 / 242
030	2,969	1,513	275.1	31 / 400
035	3,542	1,513	275.8	186 / 26
046	4,643	1,513	280.2	39 / 22
053	5,313	1,458	282.7	190 / 155
060	6,022	1,458	283.6	106 / 116
067	6,677	1,351	285.9	253 / 9
071	7,060	1,351	287.2	248 / 9
077	7,745	1,246	293.9	550 / 665
083	8,273	1,246	295.0	176 / 109
087	8,721	1,246	295.9	80 / 60
091	9,133	1,246	297.2	23 / 134
095	9,545	1,127	298.9	102 / 83
100	9,950	1,127	300.0	195 / 8
104	10,443	1,127	301.3	90 / 39
Sandy Creek				
1851	185,053	11,100	272.8	454 / 239
1867	186,655	11,100	273.8	189 / 211
1875	187,487	11,100	274.5	231 / 28
1882	188,227	11,100	275.4	220 / 37
1888	188,821	11,100	276.3	150 / 86
1901	190,147	11,100	277.2	461 / 45
1911	191,119	11,100	278.1	239 / 388
1920	191,989	11,100	278.4	422 / 417
1931	193,122	11,100	278.9	302 / 247
1943	194,343	7,630	279.8	40 / 423
Smith Creek				
010	1,000	890	334.8	50 / 50
013	1,252	890	336.5	53 / 25
015	1,500	890	338.9	40 / 8
017	1,741	745	340.7	24 / 29
019	1,917	745	341.6	8 / 20
022	2,248	745	345.9	23 / 17
025	2,475	745	347.0	30 / 19
027	2,741	745	348.5	14 / 30
030	3,000	745	350.3	17 / 17
032	3,208	745	352.1	26 / 28
034	3,368	745	352.6	12 / 22
Taylors Creek				
005	500	3,066	236.9[1]	37 / 112
010	1,000	3,066	236.9[1]	37 / 128
020	2,000	3,066	236.9[1]	137 / 28
025	2,501	2,174	245.0	135 / 15
030	3,002	2,174	245.7	90 / 50
035	3,501	2,174	246.7	35 / 120
040	4,001	3,021	236.9[1]	198 / 45

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
045	4,500	3,021	236.9[1]	198 / 122
050	5,002	3,021	236.9[1]	63 / 37
055	5,502	3,021	236.9[1]	65 / 71
060	6,002	3,021	236.9[1]	49 / 37
065	6,502	3,021	236.9[1]	34 / 138
070	7,002	1,863	259.2	90 / 60
075	7,503	1,863	262.6	42 / 30
080	8,003	2,861	238.6	32 / 203
085	8,503	2,861	240.1	57 / 55
085	8,503	2,861	240.1	57 / 55
088	8,788	3,066	236.9[1]	37 / 128
091	9,067	2,174	242.7	42 / 40
094	9,379	3,066	236.9[1]	137 / 28
098	9,808	2,174	245.0	135 / 15
102	10,210	2,174	245.7	90 / 50
106	10,630	2,174	246.7	35 / 120
Tooles Creek				
115	11,507	3,181	228.5	463 / 58
120	12,008	3,181	229.7	330 / 23
125	12,507	3,181	230.6	654 / 12
130	13,008	3,054	231.6	270 / 54
135	13,508	3,054	233.8	209 / 52
140	14,008	3,054	235.5	197 / 53
145	14,506	3,054	237.0	153 / 211
155	15,500	2,096	239.5	36 / 143
160	16,000	2,096	241.3	36 / 120
165	16,500	2,096	243.3	24 / 75
170	17,001	2,096	245.4	21 / 35
175	17,500	2,096	247.5	30 / 34
180	18,000	2,096	249.1	94 / 24
185	18,500	2,096	250.1	30 / 20
195	19,498	1,859	258.1	92 / 17
200	19,996	1,859	261.0	278 / 38
205	20,497	1,859	262.5	154 / 65
210	20,998	1,859	264.3	247 / 98
215	21,500	1,859	265.2	151 / 281
220	22,000	1,859	266.6	78 / 274
225	22,500	1,859	268.3	17 / 250
230	23,003	1,779	270.8	41 / 135
235	23,502	1,779	273.1	28 / 191
237	23,667	1,779	275.0	15 / 16
240	24,000	1,779	276.8	100 / 28
245	24,503	1,779	278.0	144 / 35
255	25,500	1,454	279.6	188 / 44
260	26,000	1,454	281.2	130 / 20

Table 17 - Limited Detailed Flood Hazard Data

Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width (feet) Left/Right from Stream Centerline
265	26,502	1,454	283.8	54 / 233
270	27,003	1,408	285.0	39 / 175
275	27,503	1,408	287.3	142 / 68
280	28,000	1,037	288.8	245 / 89
290	29,002	1,037	293.5	28 / 64
295	29,502	992	297.4	28 / 126
300	30,002	992	299.4	66 / 139
305	30,503	992	302.1	92 / 69
310	31,004	907	305.1	26 / 117
316	31,612	907	309.8	29 / 71

[1]Elevation includes backwater effects

5.3 Coastal Analyses

This section is not applicable to this FIS project. Table 18 “Summary of Coastal Analyses” does not apply to Franklin County.

6.0 Mapping Methods

6.1 Vertical and Horizontal Control

Vertical Datum

All FISs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. With the finalization of the North American Vertical Datum of 1988 (NAVD 88), all North Carolina FISs have been prepared using NAVD 88 as the referenced vertical datum.

All flood elevations shown on the FIRM for Franklin County are referenced to NAVD 88. Structure and ground elevations in the county must, therefore, be referenced to NAVD 88. It is important to note that FISs for adjacent communities in neighboring states may be referenced to NGVD 29. This may result in BFE differences across political boundaries between the communities.

As noted above, the elevations shown in this FIS are referenced to NAVD 88. Ground, structure, and flood elevations may be compared and/or referenced to NGVD 29 by applying a standard conversion factor. The conversion factor for Franklin County is # feet. The locations used to establish the conversion factor were USGS quadrangle corners that fell within the county, as well as those that were within 2.5 miles outside the county. The benchmarks are referenced to NAVD 88. Table 21, “Datum Conversion Locations and Values,” is shown below.

Table 21, “Datum Conversion Locations and Values.”

Table 21 - Datum Conversion Locations and Values

Latitude	Longitude	Conversion from NGVD29 to NAVD88 (feet)
36.25	-78.25	-0.95
36.13	-78.50	-0.93
36.13	-78.38	-0.95
36.13	-78.25	-0.96
36.12	-78.12	-0.98
36.00	-78.37	-0.92
36.00	-78.25	-0.98
35.87	-78.25	-0.98
Average conversion in Franklin County from NGVD 29 to NAVD 88 = -0.96 feet		

The vertical datum conversion factor for all flooding sources which run along a county boundary are in accordance with the conversion factor used in those contiguous counties.

BFEs shown on the FIRM represent whole-foot rounded values. For example, a 1% annual chance water-surface elevation of 102.4 feet will appear as 102 on the FIRM and 102.6 feet will appear as 103. Therefore, users who wish to convert the elevations in this FIS to NGVD 29 should apply the stated conversion factor(s) to elevations shown on the Flood Profiles and/or Water-surface elevation rasters and supporting data tables in the FIS Report, which are shown, at a minimum, to the nearest 0.1 foot.

For more information on NAVD 88, see Converting the National Flood Insurance Program to the North American Vertical Datum of 1988, or contact the Vertical Network Branch, National Geodetic Survey, Coast and Geodetic Survey, National Oceanic and Atmospheric Administration, Rockville, Maryland 20910 (http://www.ngs.noaa.gov).

Vertical Control Monuments

Qualifying bench marks within Franklin County that are cataloged by the National Geodetic Survey (NGS) and entered into the National Spatial Reference System (NSRS) as First or Second Order Vertical, with a vertical stability classification of A, B, or C, are shown and labeled on the FIRM with their 6-character NSRS Permanent Identifier (PID).

The National Geodetic Survey establishes precisely located monuments on the North Carolina Grid System and Bench Marks referenced to a vertical datum (NGVD 1929 and NAVD 1988).

Bench marks cataloged by the NGS and entered into the NSRS vary widely in vertical stability classification. NSRS vertical stability classifications are as follows:

- Stability A: Monuments of the most reliable nature, expected to hold position/elevation well (e.g., mounted in bedrock)
- Stability B: Monuments which generally hold their position/elevation well (e.g., concrete bridge abutment)
- Stability C: Monuments which may be affected by surface ground movements (e.g., concrete monument below frost line)
- Stability D: Mark of questionable or unknown vertical stability (e.g., concrete monument above frost line, or steel witness post)

Monuments with a Stability D classification may be used as Elevation Reference Marks (ERMs) when a Stability C or better monument is not an option. These ERMs must be approved by NCGS and can be set and used as elevation bench marks to establish vertical control and produce NC DFIRMs. Including such ERMs will greatly augment North Carolina’s useable vertical control network.

In addition, when local jurisdictions have established their own vertical monument network, these monuments may also be shown on the FIRM with the appropriate designations. Local monuments will be placed on the FIRM if the community has requested that they be included and if the monuments meet the aforementioned criteria.

North Carolina Geodetic Survey (NCGS) and contractor surveyed vertical control monuments will be shown on the FIRM panels. Those cataloged by NCGS meet similar requirements to the NGS monuments as described above. Most monuments that have been cataloged by NCGS have been established to NGS standards, but have not been submitted to NGS for inclusion into the NSRS. The qualifying criteria for depicting bench marks established by the State’s contractors on the new digital FIRM panels include:

- GPS surveying of permanent 3-D survey monuments to 5-centimeter or better local network accuracy guidelines, in accordance with NOAA Technical Memorandum NOS NGS-58 “Guidelines for Establishing GPS-Derived Ellipsoid Heights (Standards: 2 cm and 5 cm),” and conversion to NAVD 88 orthometric heights using NGS’ latest geoid mode;
- Requiring a stability classification of “C” or better; and
- Submitting GPS files and station descriptions to NCGS.

To obtain current information for cataloging local bench marks in the NSRS, please visit the Data Sheet page of the NGS website at http://www.ngs.noaa.gov/cgi-bin/datasheet.prl, or contact the NGS Information Services Branch at:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-32822
(301) 713-3242

Information regarding the NCGS or State contractor bench marks can be obtained through the NCGS website at www.ncgs.state.nc.us, or by phone at (919) 733-3836.

It is important to note that temporary vertical monuments, sometimes called Elevation Reference Marks, are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, interested individuals may contact FEMA to access this information.

Horizontal Datum and Control
The digital files that comprise the FIRM are georeferenced to an established coordinate system. The coordinate system used for the production of this FIRM is North Carolina State Plane (FIPSZONE 3200) referenced to the North American Datum of 1983 (NAD83), GRS80 ellipsoid.

6.2 Base Map

The FIRMs and FIS Report for this project have been produced in a digital format. The flood hazard information was converted to a Geographic Information System (GIS) format that meets FEMA's FIRM database specifications and geographic information standards. This information is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community. The FIRM Database includes most of the tabular information contained in the FIS Report in such a way that the data can be associated with pertinent spatial features.

The projection used in the preparation of this map was the North Carolina State Plane Coordinate System. The horizontal datum was NAD83, GRS80 spheroid. Differences in datum, spheroid, or projection used in the production of FIRMs for adjacent states may result in slight positional differences in map features across the state boundary. These differences do not affect the accuracy of this FIRM.

As part of the North Carolina CTS Initiative, North Carolina digital FIRM panel numbers are consistent with the North Carolina Land Records Management Program (LRMP).

The 11-digit digital FIRM panel numbering system for North Carolina is: SS MM LLLL PP X, where SS = State Federal Information Processing Code (37); MM = Easting-Northing (EN) 1,000,000-foot coordinates; LLLL = LRMP map numbers to include the EN 100,000-foot coordinates, and the EN 10,000-foot coordinates; PP = place holders for additional EN 1,000-foot coordinates; and X = suffix ("J" for the initial edition). North Carolina's State Plane Coordinate System origin is outside the State boundary to the southwest (in Georgia), the eastings range from approximately 0,404,000 (Tennessee border) to 3,040,000 (Atlantic Ocean); and the northings range from approximately 0,045,000 (South Carolina border) to 1,043,000 (Virginia border). Digital FIRM panels were compiled at either 1"=1,000', covering an area of 20,000 feet x 20,000 feet (20" x 20" panels); or at 1"=500', covering an area of 10,000 feet x 10,000 feet (20" x 20" panels). An additional 2 digits (both zeros) are held in reserve as a "place holder" in the event that future FIRMs are printed at a larger scale; e.g., 1"=250', covering an area of 5,000 feet x 5,000 feet for which the 1,000-foot coordinates would either be 0 or 5.

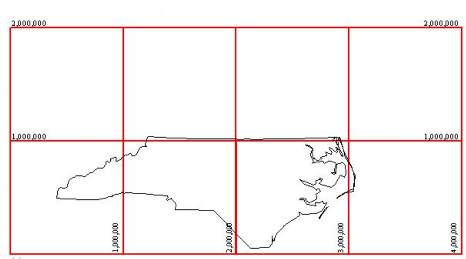


Figure 3 - North Carolina's State Plane Coordinate System

6.3 Floodplain and Floodway Delineation

Floodplain Boundaries

For streams restudied by detailed and limited detailed methods, the 1% and 0.2% annual chance floodplains were delineated using flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic data acquired using airborne Light Detection and Ranging (LIDAR). This LIDAR data was acquired during the (insert date from basin plan and update for map maintenance, if necessary) flying season.

The topographic data satisfies a vertical root-mean-square error (RMSE) accuracy standard of 20 cm (1.3 feet accuracy at the 95% confidence limit) for the Outer Banks and 25 cm (1.6 feet accuracy at the 95% confidence limit) for those portions of the basin lying west of the Outer Banks. These data could be contoured at roughly a 2-foot vertical contour interval. All elevations were referenced to the NAVD 88 and reflect orthometric heights. Variably spaced, bare-earth digital topographic data in ASCII point file format were combined with imagery (either flown concurrently with the LIDAR data or using existing digital orthophotos) to establish a Triangulated Irregular Network (TIN) of digital elevation points, which include selected breaklines to be used for hydraulic modeling. Furthermore, a uniformly spaced sampling of the TIN resulted in uniformly spaced Digital Elevation Models (DEMs), with 20 ft x 20 ft post spacing, which was generated in multiple file formats.

The 1% annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones VE, AO, AH, A99, AR, A, and AE), and the 0.2% annual chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1% and 0.2% annual chance floodplain boundaries are close together, only the 1% annual chance floodplain boundaries have been shown.

Floodway Delineation

The floodways presented in this FIS were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 22, “Floodway Data”). The computed floodway is shown on the FIRM. In cases where the floodway and 1% annual chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown. In areas where the top of the bridge or road is higher than the 1.0-percent annual chance (100-year) flood, the FIRM will show the flood discharge as contained within the structure for emergency management purposes. It is important to note that FEMA and community floodway regulations still apply in and around those areas.

Table 22 - Floodway Data

Floodway Source		Floodway			Water Surface Elevation			
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	Without Floodway	With Floodway	Increase
Smith Creek								
429	42,909	64	232	10.0	332.3	332.3	332.8	0.5
Tar River								
8036	803,648	934	14,867	1.7	224.1	224.1	225.1	0.9
8052	805,222	751	9,502	2.6	224.3	224.3	225.3	0.9
8072	807,167	886	12,174	2.0	225.3	225.3	226.2	0.9
8086	808,623	805	9,921	2.5	225.5	225.5	226.4	0.9
8094	809,415	462	6,568	3.7	225.7	225.7	226.6	0.9
8118	811,785	466	8,424	2.9	227.4	227.4	228.2	0.9
8134	813,360	421	7,515	3.3	228.0	228.0	228.9	0.9
8150	814,956	1,223	19,498	1.3	228.9	228.9	229.8	0.9
8157	815,727	1,071	17,005	1.4	229.0	229.0	230.0	0.9
8173	817,310	627	9,542	2.6	229.3	229.3	230.3	0.9
8181	818,144	761	10,848	2.2	229.7	229.7	230.6	1.0
8198	819,841	933	13,993	1.7	230.4	230.4	231.3	0.9

Table 22 - Floodway Data

Floodway Source		Floodway			Water Surface Elevation			
Cross Section	Distance (Feet Above Mouth)	Width (Feet)	Section Area (Square Feet)	Mean Velocity (Feet Per Second)	Regulatory	Without Floodway	With Floodway	Increase
8213	821,259	564	10,117	2.4	230.8	230.8	231.7	0.9
8229	822,906	1,248	20,321	1.2	231.5	231.5	232.4	0.9
8247	824,686	1,483	22,341	1.1	231.7	231.7	232.7	0.9
8260	825,992	1,077	16,824	1.4	231.9	231.9	232.8	0.9
8272	827,152	428	6,702	3.6	231.9	231.9	232.8	0.9
8290	828,993	419	7,502	3.2	233.8	233.8	234.7	1.0
8310	830,993	436	7,078	3.3	235.8	235.8	236.6	0.8
8317	831,662	274	5,546	4.2	235.7	235.7	236.6	0.8
8328	832,786	504	8,638	2.7	236.8	236.8	237.8	0.9
8343	834,280	424	8,256	2.8	237.4	237.4	238.4	0.9
8353	835,296	340	6,331	3.7	237.6	237.6	238.5	0.9
8367	836,701	774	14,661	1.6	238.8	238.8	239.8	1.0
8380	837,995	421	8,428	2.8	239.0	239.0	239.9	1.0
8393	839,321	346	7,133	3.3	239.4	239.4	240.4	1.0
8411	841,080	304	6,571	3.6	240.2	240.2	241.2	1.0
8429	842,907	287	6,078	3.8	241.0	241.0	242.0	1.0
8436	843,638	308	6,065	3.8	241.6	241.6	242.5	0.9
8449	844,939	503	8,689	2.7	242.3	242.3	243.2	0.9
8463	846,348	676	12,585	1.8	243.2	243.2	244.1	1.0
8476	847,607	907	15,796	1.5	243.4	243.4	244.4	1.0
8497	849,701	370	6,981	3.3	243.4	243.4	244.4	1.0

6.4 Coastal Flood Hazard Mapping

Flood insurance zones and BFEs including the wave effects were identified on each transect based on the results from the onshore wave hazard analyses. Between transects, elevations were interpolated using topographic maps, land-use and land-cover data, and knowledge of coastal flood processes to determine the aerial extent of flooding. Sources for topographic data are shown in Table 23.

Zone VE is subdivided into elevation zones and BFEs are provided on the FIRM.

The limit of Zone VE shown on the FIRM is defined as the farthest inland extent of any of these criteria (determined for the 1% annual chance flood condition):

- *The primary frontal dune* zone is defined in 44 CFR Section 59.1 of the NFIP regulations. The primary frontal dune represents a continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes that occur immediately landward and adjacent to the beach. The primary frontal dune zone is subject to erosion and overtopping from high tides and waves during major coastal storms. The inland limit of the primary frontal dune zone occurs at the point where there is a distinct change from a relatively steep slope to a relatively mild slope.
- *The wave runup zone* occurs where the (eroded) ground profile is 3.0 feet or more below the 2-percent wave runup elevation.
- *The wave overtopping splash zone* is the area landward of the crest of an overtopped barrier, in cases where the potential 2-percent wave runup exceeds the barrier crest elevation by 3.0 feet or more.
- *The breaking wave height zone* occurs where 3-foot or greater wave heights could occur (this is the area where the wave crest profile is 2.1 feet or more above the total stillwater elevation).

- *The high-velocity flow zone* is landward of the overtopping splash zone (or area on a sloping beach or other shore type), where the product of depth of flow times the flow velocity squared (hv2) is greater than or equal to 200 ft3/sec2. This zone may only be used on the Pacific Coast.

The SFHA boundary indicates the limit of SFHAs shown on the FIRM as either “V” zones or “A” zones.

Table 23, “Summary of Coastal Transect Mapping Considerations” is not applicable in Franklin County.

A LiMWA boundary has also been added in coastal areas subject to wave action for use by local communities in safe rebuilding practices. The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. In areas where the Zone VE designation is based on the presence of a primary frontal dune the LiMWA was not delineated.

7.0 Revising the FIS

7.1 Letters of Map Amendment and Letters of Map Revision - Based on Fill

LOMAs and LOMR-Fs are documents issued by FEMA that officially remove a property and/or a structure from a Special Flood Hazard Area (SFHA), if data supporting the removal are submitted. LOMAs and LOMR-Fs are generally determinations regarding areas that are too small to be shown on a FIRM panel; consequently, the changes they describe become official without revising the FIRM or the FIS Report.

NFIP regulations require that the lowest adjacent grade (the lowest ground touching the structure) be at or above the 1% annual chance flood elevation for a LOMA to be issued. Currently, there is no fee for FEMA’s review of a LOMA request, but the requester of a LOMA is responsible for providing all the information needed for the review, which may include structure and/or property elevations certified by a licensed land surveyor or professional engineer. Therefore, LOMA requesters may need to retain the services of a land surveyor or engineer.

A LOMA cannot be used for property on which fill has been placed. For those situations, a LOMR-F must be used. As a participant in the NFIP, a local government must adopt ordinances that meet the minimum Federal floodplain management standards, which are outlined in Section 60.3 of the NFIP regulations. For a number of reasons, these ordinances generally vary from community to community. Nonetheless, because the placement of fill within the floodplain can affect flood hazards in the surrounding area, additional information is needed before FEMA can process a LOMR-F request. Among the data required for a LOMR-F is the community acknowledgment form. This form is FEMA’s assurance that all appropriate Federal, State, and local floodplain management requirements have been met. Furthermore, NFIP regulations require that the lowest adjacent grade (the lowest ground touching the structure) be at or above the 1% annual chance flood elevation for a LOMR-F to be issued removing the structure from the floodplain. Because LOMR-F requests are the result of changed physical conditions rather than limitations of scale or topographic definition, FEMA charges a fee for the review of a LOMR-F request. As with the LOMA, the requester of a LOMR-F is responsible for providing all supporting information, including structure and/or property elevation data.

In cases where property owners plan to add fill in the SFHA, NFIP regulations require plans and technical information to be submitted for review by FEMA before construction takes place. FEMA will issue a conditional LOMR-F stating how flood hazards would change and what portions of the property, if any, would remain in the SFHA if the project were built according to the submitted plans.

The issuance of a LOMA or LOMR-F ends the property owner’s obligation to purchase flood insurance as a condition of Federal or federally backed financing. However, the property owner’s mortgage company maintains the prerogative to require flood insurance as a condition of providing financing. Before attempting to obtain a LOMA or LOMR-F, property owners are advised to consult their mortgage companies regarding this policy. Even if the mortgage company indicates that it will require flood insurance if a LOMA or LOMR-F is issued, it may be advantageous for property owners to request a LOMA or LOMR-F because flood insurance premiums are lower for properties removed from the SFHA than for properties that remain within the SFHA.

For additional information regarding LOMAs, LOMR-Fs, conditional LOMR-Fs, or current application fees, please call the FEMA Map Information eXchange (FMIX) toll-free information line at 1-877-FEMA MAP (1-877-336-2627).

7.2 Letters of Map Revision

A Letter of Map Revision (LOMR) is a document issued by FEMA and the NCFMP that revises an FIS Report and/or FIRM. A LOMR is used to change flood risk zones, floodplain and/or floodway delineations, flood elevations, or planimetric features such as road systems or corporate limits. A LOMR provides FEMA and the NCFMP with a cost-effective means of revising the FIS information without physically changing and reprinting the map or report itself. A portion of the FIRM panel or FIS Report showing the revised information is issued with the LOMR. The LOMR is sent to all affected communities and is archived in the communities' NFIP map repository for public reference.

In cases where a proposed project (such as construction in the 1% annual chance floodplain) would result in a significant rise in 1% annual chance water-surface elevations, NFIP regulations require the community to submit plans and technical information for review by FEMA and the NCFMP before construction takes place. This assures communities participating in the NFIP that proposed projects meet minimum NFIP requirements. The result of FEMA and the NCFMP reviews is documented in a conditional LOMR.

For additional information regarding LOMRs, conditional LOMRs, or current application fees, please call the FEMA Map Assistance Center toll-free information line at 1-877-FEMA MAP (1-877-336-2627) or the NCFMP at 919-715-5711.

7.3 Physical Map Revisions

Physical Map Revisions (PMRs) are processed to incorporate information concerning conditions present in the community that are not reflected in the FIS, and involve distributing republished FISs that supersede the most current NFIP data in the community repository. PMRs may be initiated by a request from a community resident or agency, or FEMA may initiate a PMR to incorporate one or more LOMRs, to reflect significant changes in corporate limits, to correct errors, or to update flood hazards to match new information from an adjacent community's FIS. Due to the costs associated with updating and distributing FISs, map revisions will be processed as LOMRs rather than PMRs whenever possible. For more information regarding PMRs, please contact the FEMA Map Information eXchange (FMIX) toll-free information line at 1-877-FEMA MAP (1-877-336-2627), the FEMA Regional Office at the address listed on the Notice to Flood Insurance Study Users page at the front of this report, or the NCFMP at 919-715-5711.

7.4 Contracted Restudies

The NFIP provides for a periodic review and restudy of flood hazards in a given community. FEMA accomplishes this through a national mapping needs assessment process that assigns priorities and allocates funds to sponsor or subsidize new flood hazard analyses used to update FIS Reports. For map maintenance restudies within the state of North Carolina, scoping will be performed by county approximately 2.5-3.5 years after the previous effective date. Scoping will focus on streams with restudy needs within those previously effective counties rather than on full countywide restudies. A restudy refers specifically to updating or reevaluating engineering analyses that were performed for a flood mapping project that directly impact BFEs and/or flood hazard boundary extents or analysis of previously unstudied flood prone areas. Restudy project evaluation triggers and prioritization values are an essential component of the map maintenance program. For more information regarding NCFMP-contracted restudies, please contact the NCFMP at 919-715-5711 or at www.ncfloodmaps.com. For more information regarding FEMA-contracted restudies, please contact the FEMA Map Information eXchange (FMIX) toll-free information line at 1-877-FEMA MAP(1-877-336-2627) or the FEMA Regional Office at the address listed on the Notice to Flood Insurance Study Users page at the front of this report.

7.5 Map Revision History

The current FIRM is a subset of the Statewide FIRM, showing flood hazard information for the entire geographic area of Franklin County. Previously, separate Flood Hazard Boundary Maps (FHBMs), Flood Boundary and Floodway Maps (FBFMs), and/or FIRMs were prepared for each identified flood prone jurisdiction within the county. Historical data relating to the NFIP maps prepared for each community prior to and including the 1/16/2004 North Carolina Statewide FIRM, which includes Franklin County, are presented in Table 22, "Community Map History."

Information pertaining to revised and unrevised flood hazards for each jurisdiction within Franklin County has been compiled into this FIS. Therefore, this FIS supersedes all previously printed FIS Reports, FHBMs, FIRMs, and/or FBFMs for all of the incorporated and unincorporated jurisdictions within Franklin County.

Table 24 - Map Revision History

Community	Initial Identification Date	Initial FIRM Effective Date	FIS Revision Date
FRANKLIN COUNTY	9/15/1978	5/1/2000	04/16/2013
TOWN OF BUNN	1/19/2001	1/19/2001	04/16/2013
TOWN OF CENTERVILLE	1/19/2001	1/19/2001	04/16/2013
TOWN OF FRANKLINTON	1/19/2001	1/19/2001	04/16/2013
TOWN OF LOUISBURG	6/14/1974	3/4/1988	04/16/2013
TOWN OF WAKE FOREST	3/15/1974	7/3/1978	04/16/2013
TOWN OF YOUNGSVILLE	1/19/2001	1/19/2001	04/16/2013

8.0 Study Contracting and Community Coordination

8.1 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

This FIS revises and updates the previous countywide FIS for the geographic area of Franklin County and Incorporated Areas. Table 25, "Authority and Acknowledgments," includes information for the previous countywide FIS and for this revision. This table also includes information for the single-jurisdiction FISs published for each community included in this countywide FIS (if available) as compiled from their previously printed FIS Reports

Table 25 — Authority and Acknowledgments

Community	FIS Dated	Study Contracted By	Data Source	Contract or IAA Number	Work Completed In
FRANKLIN COUNTY	1/16/2004	NCFMP	NCFMP	286-000022	8/16/2013
FRANKLIN COUNTY	1/16/2004	NCFMP	NCFMP	19-000017	10/29/2012
FRANKLIN COUNTY	1/16/2004	NCFMP	NCFMP	286-000022	12/1/2012
TOWN OF BUNN	1/16/2004	NCFMP	NCFMP	286-000022	8/16/2013
TOWN OF BUNN	1/16/2004	NCFMP	NCFMP	19-000017	10/29/2012
TOWN OF BUNN	1/16/2004	NCFMP	NCFMP	286-000022	12/1/2012
TOWN OF CENTERVILLE	1/16/2004	NCFMP	NCFMP	286-000022	8/16/2013
TOWN OF CENTERVILLE	1/16/2004	NCFMP	NCFMP	19-000017	10/29/2012
TOWN OF CENTERVILLE	1/16/2004	NCFMP	NCFMP	286-000022	12/1/2012
TOWN OF FRANKLINTON	1/16/2004	NCFMP	NCFMP	286-000022	8/16/2013
TOWN OF FRANKLINTON	1/16/2004	NCFMP	NCFMP	19-000017	10/29/2012
TOWN OF FRANKLINTON	1/16/2004	NCFMP	NCFMP	286-000022	12/1/2012
TOWN OF LOUISBURG	1/16/2004	NCFMP	NCFMP	286-000022	8/16/2013
TOWN OF LOUISBURG	1/16/2004	NCFMP	NCFMP	19-000017	10/29/2012
TOWN OF LOUISBURG	1/16/2004	NCFMP	NCFMP	286-000022	12/1/2012
TOWN OF WAKE FOREST	1/16/2004	NCFMP	NCFMP	286-000022	8/16/2013
TOWN OF WAKE FOREST	1/16/2004	NCFMP	NCFMP	19-000017	10/29/2012
TOWN OF WAKE FOREST	1/16/2004	NCFMP	NCFMP	286-000022	12/1/2012
TOWN OF YOUNGSVILLE	1/16/2004	NCFMP	NCFMP	286-000022	8/16/2013
TOWN OF YOUNGSVILLE	1/16/2004	NCFMP	NCFMP	19-000017	10/29/2012
TOWN OF YOUNGSVILLE	1/16/2004	NCFMP	NCFMP	286-000022	12/1/2012

This FIS Report was produced through a unique cooperative partnership between the State of North Carolina and FEMA. The State of North Carolina, through FEMA's Cooperating Technical Partner (CTP) Initiative, has become the first Cooperating Technical State (CTS) and will assume primary ownership of the NFIP FIRM panels for all North Carolina communities. This role has traditionally been fulfilled by FEMA. The North Carolina Floodplain Mapping Program is conducting flood hazard analyses and producing updated, digital FIRM panels. The hydrologic and hydraulic analyses and the FIRM panels for the initial statewide mapping for Franklin County were produced by NCFMP under contract with the State of North Carolina and issued on effective 3/31/2015.   For this revision, the hydrologic and hydraulic analyses and the FIRM panels were produced by NCFMP, under contract with the State of North Carolina.

8.2 Consultation Coordination Officer's Meetings/Scoping Meetings

In general, for each FIS an initial Consultation Coordination Officer's (CCO) meeting is held with representatives from FEMA, the communities, and the study contractors to explain the nature and purpose of the FIS and to identify the streams to be studied by detailed methods. A final CCO meeting is held with representatives from FEMA, the communities, and the study contractors to review the results of the study

The dates of the initial and final CCO meetings held for Franklin County and Incorporated Areas were compiled from the previous countywide FIS Report and are shown in Table 26, "Consultation Coordination Officer's Meetings

Table 26 — Consultation Coordination Officer's Meetings

Community	For FIS Dated	Initial CCO Date	Attended By	Final CCO Date	Attended By
FRANKLIN COUNTY	5/1/2000	11/24/1997	NP	7/19/1999	Representatives of Franklin County, the Town of Louisburg, USACE, NCDEM, and FEMA
TOWN OF LOUISBURG	3/4/1988	2/26/1985	NP	4/8/1987	NP
TOWN OF LOUISBURG ETJ	3/4/1988	2/26/1985	NP	4/8/1987	NP

For each FIS produced during the initial phase of statewide, an Initial Scoping Meeting was held with representatives from FEMA, the county, the incorporated communities, and the State of North Carolina. A Final Scoping meeting was held to review the Draft Basin Plan and finalize the streams to be studied by detailed methods. This information was then used to create the Final Basin Plan.

For map maintenance revisions, only one scoping meeting was held to identify the streams to be newly studied by detailed methods, redelineated, or to be studied by limited detailed methods. This information was then used to create the Map Maintenance Plan.

The historical dates of the Initial and Final Scoping Meetings held during the first round of statewide mapping for Franklin County are shown in Table 27, "Scoping Meetings." Meetings held for the map maintenance revision are also included below for Franklin County.

Table 27 — Scoping Meetings

Community	Riverbasin	Initial Scoping Date	Attended By	Final Scoping Date	Attended By
FRANKLIN COUNTY	NEUSE	10/3/2000	Representatives of the State, FEMA, Dewberry, and Franklin County	1/31/2001	Representatives of the State, FEMA, Dewberry, and Franklin County
FRANKLIN COUNTY	NEUSE	10/3/2000	Representatives of the State, FEMA, Dewberry, and Franklin County	4/23/2001	Representatives of the State, FEMA, Dewberry, and Franklin County
FRANKLIN COUNTY	TAR-PAMLICO	10/3/2000	Representatives of the State, FEMA, Dewberry, and Franklin County	1/31/2001	Representatives of the State, FEMA, Dewberry, and Franklin County
FRANKLIN COUNTY	TAR-PAMLICO	10/3/2000	Representatives of the State, FEMA, Dewberry, and Franklin County	4/23/2001	Representatives of the State, FEMA, Dewberry, and Franklin County
FRANKLIN COUNTY	TAR-PAMLICO	8/8/8888	Representatives of the State, FEMA, Dewberry, and Franklin County	5/3/2006	Representatives of the State, FEMA, Dewberry, and Franklin County
TOWN OF FRANKLINTON	TAR-PAMLICO	10/3/2000	Representatives of the State, FEMA, Dewberry, and Franklin County	1/31/2001	Representatives of the State, FEMA, Dewberry, and Franklin County
TOWN OF FRANKLINTON ETJ	TAR-PAMLICO	10/3/2000	Representatives of the State, FEMA, Dewberry, and Franklin County	1/31/2001	Representatives of the State, FEMA, Dewberry, and Franklin County
TOWN OF WAKE FOREST	NEUSE	11/29/2000	Representatives of the State, FEMA, Dewberry, and the Towns of Rolesville and Wake Forest	4/23/2001	State,FEMA,Dewberry,county,Raleigh,Apex,Cary,Garner,HollySprings,Knightdale,WakeForest,Wndell,Zebuln

Preliminary Meetings are held in each county to disseminate and review the FIS Report and FIRM panels. This meeting is required by FEMA. Public Participation Meetings are not required by FEMA, but provide an opportunity to review and discuss the FIS Report and FIRM panels for each jurisdiction in a public setting. The dates for the preliminary and public participation meetings are shown in Table

28, “Preliminary and Public Participation Meetings.”

Table 28 — Preliminary and Public Participation Meetings

Community	For FIS Dated	Meeting Location	Preliminary Meeting Date	Attended By	Public Meeting Date	Attended By
FRANKLIN COUNTY	1/16/2004	Louisburg	12/12/2002	Representatives of the State, Dewberry, and Franklin County	9/5/2002	NP
FRANKLIN COUNTY	1/16/2004	Louisburg	12/12/2002	Representatives of the State, Dewberry, and Franklin County	1/14/2003	NP
FRANKLIN COUNTY	4/16/2013	Louisburg	7/15/2010	Representatives of the State, Franklin County and Incorporated Communities, and Dewberry	8/10/2010	Representatives of the State, Franklin County and Incorporated Communities
FRANKLIN COUNTY	4/16/2013	Louisburg	7/15/2010	Representatives of the State, Franklin County and Incorporated Communities, and Dewberry	8/10/2010	Representatives of the State, Granville County, and Dewberry
FRANKLIN COUNTY	4/16/2013	Louisburg	7/15/2010	Representatives of the State, Franklin County and Incorporated Communities, and Dewberry	8/10/2010	Representatives of the State, Vance County and Incorporated Communities, and Dewberry
FRANKLIN COUNTY	4/16/2013	Louisburg	7/15/2010	Representatives of the State, Franklin County and Incorporated Communities, and Dewberry	8/10/2010	Representatives of the State, Wake County and Incorporated Communities, and Dewberry
FRANKLIN COUNTY	4/16/2013	Louisburg	7/15/2010	Representatives of the State, Franklin County and Incorporated Communities, and Dewberry	11/15/2010	Representatives of the State, Nash County and Incorporated Communities, and Dewberry
FRANKLIN COUNTY	4/16/2013	Louisburg	7/15/2010	Representatives of the State, Franklin County and Incorporated Communities, and Dewberry	1/16/2011	Representatives of the State, Nash County and Incorporated Communities, and Dewberry
FRANKLIN COUNTY	4/16/2013	Louisburg	7/15/2010	Representatives of the State, Franklin County and Incorporated Communities, and Dewberry	4/18/2011	Representatives of the State, FEMA, Dewberry, and Wilson County and Incorporated Areas
FRANKLIN COUNTY	4/16/2013	Louisburg	7/15/2010	Representatives of the State, Franklin County and Incorporated Communities, and Dewberry	10/19/2011	Representatives of the State, FEMA, Dewberry, and Pitt County and Incorporated Areas
FRANKLIN COUNTY	4/16/2013	Louisburg	7/15/2010	Representatives of the State, Franklin County and Incorporated Communities, and Dewberry	10/20/2011	Representatives of the State, FEMA, Dewberry, and Lenoir County and Incorporated Areas
FRANKLIN COUNTY	4/16/2013	Louisburg	7/15/2010	Representatives of the State, Franklin County and Incorporated Communities, and Dewberry	12/2/2011	Representatives of the State, FEMA, Dewberry, and Greene County and Incorporated Areas
FRANKLIN COUNTY	4/16/2013	Louisburg	7/15/2010	Representatives of the State, Franklin County and Incorporated Communities, and Dewberry	12/2/2012	Representatives of the State, FEMA, Dewberry, and Greene County and Incorporated Areas

9.0 Guide to Additional Information

Information concerning the pertinent data used in the preparation of this FIS Report can be obtained by submitting an order with any required payment to the FEMA Engineering Library. For more information on this process, see http://www.fema.gov.

The Map Repositories table below lists locations where FIRMs for Franklin County can be viewed. Please note that the maps at these locations are for reference only and are not for distribution. Also, please note that only the maps for the community listed in the table are available at that particular repository. A user may need to visit another repository to view maps from an adjacent community.

Table 27 — Map Repositories

Community	Address	City	State	Zip Code
Town of Franklinton	Franklinton Town Hall, West Mason Street	Franklinton	NC	27525
Town of Centerville	Town Hall, 2589 Laurel Mill Road	Louisburg	NC	27549
Town of Bunn	Bunn Town Hall, 601 Main Street	Bunn	NC	27508
Town of Youngsville	Youngsville Town Hall, 118 North Cross Street	Youngsville	NC	27596
Town of Wake Forest	Wake Forest Planning Department, 301 South Brooks Street, 3rd Floor	Wake Forest	NC	27587
Franklin County	Franklin County Planning and Inspections, 215 East Nash Street	Louisburg	NC	27549
Town of Louisburg	Franklin County Planning and Inspections, 215 E. Nash St	Louisburg	NC	27549

9.1 Additional Information

All FIRM panels created for the State of North Carolina are produced in a seamless statewide format; however, FIS Reports are produced for individual counties.

Copies of FIRM panels are available for a nominal fee. To obtain a copy of the current flood map for a specific community, contact the FEMA Map Service Center at 1-800-358-9616. To facilitate the processing of your request, please review the current flood map on file at your local community repository and obtain the panel number in which you are interested. If necessary, users may also order a FIRM Index from the Map Service Center to determine the appropriate panel numbers. The Map Service Center also accepts orders for the Community Status Book and the Flood Insurance Manual. The FIS Report, FIRM panels, and digital data used to produce the FIRM panels are available online at www.ncfloodmaps.com.

Information concerning the data used in the preparation of this FIS, contained in an Engineering Study Data Package, may be obtained by contacting the FEMA Regional Office at the address listed on the Notice to Flood Insurance Study Users page at the front of this report.

Table 28, “Additional Information” is not applicable in Franklin County.

10.0 Appendix

10.1 Bibliography

All bibliography and reference information associated within this Flood Insurance Study are maintained and accessible within the geodatabase structure and associated metadata. Users requiring more specific information should contact the North Carolina Floodplain Mapping Program (NCFMP) at www.ncfloodmaps.com under the Contacts menu