

Prepared for the Federal Emergency Management Agency, Region 1

# Scoping of Flood Hazard Mapping Needs for Carroll County, New Hampshire

Open-File Report 2006–1236

U.S. Department of the Interior  
U.S. Geological Survey



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By Robert H. Flynn

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**U.S. Department of the Interior  
U.S. Geological Survey**

**U.S. Department of the Interior**  
DIRK KEMPTHORNE, Secretary

**U.S. Geological Survey**  
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## CONVERSION FACTORS AND ABBREVIATIONS

<b>Multiply</b>	<b>By</b>	<b>To obtain</b>
<b>Length</b>		
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
<b>Area</b>		
square foot (ft <sup>2</sup> )	0.09290	square meter (m <sup>2</sup> )
square inch (in <sup>2</sup> )	6.452	square centimeter (cm <sup>2</sup> )
square mile (mi <sup>2</sup> )	2.590	square kilometer (km <sup>2</sup> )
<b>Volume</b>		
cubic foot (ft <sup>3</sup> )	0.02832	cubic meter (m <sup>3</sup> )
<b>Slope</b>		
foot per mile (ft/mi)	0.1894	meter per kilometer (m/km)
<b>Velocity and Flow</b>		
foot per second (ft/s)	0.3048	meter per second (m/s)
cubic foot per second (ft <sup>3</sup> /s)	0.02832	cubic meter per second (m <sup>3</sup> /s)

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

## OTHER ABBREVIATIONS USED IN REPORT

APFO	Aerial Photography Field Office
BFE	Base Flood Elevation
CAC	Community Assistance Contact
CAV	Community Assistance Visit
cfs	cubic feet per second
CID	Community Identification
CIS	Community Information System
COTR	Contracting Officer's Technical Representative
CTP	Cooperating Technical Partner
DEM	Digital Elevation Model
DFIRM	Digital Flood Insurance Rate Map
DOQ	Digital Orthophoto Quadrangle
DOQQ	Digital Ortho Quarter Quadrangle
DTM	Digital Terrain Model
FBFM	Flood Boundary and Floodway Map
FEMA	Federal Emergency Management Agency
FHBM	Flood Hazard Boundary Map
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study

GIS	Geographic Information System
GRANIT	Geographically Referenced ANalysis and Information Transfer system
GSP	Ground Sample Distance
H&H	Hydrologic and Hydraulic
LiDAR	Light Detection and Ranging
LOMA	Letter of Map Amendment
LOMC	Letters of Map Change
LOMR	Letter of Map Revision
LOMR-F	Letter of Map Revision based on Fill
MNA	Mapping Needs Assessment
MNUSS	Mapping Needs Update Support System
MrSID	Multi-resolution Seamless Image Database
NAIP	National Agriculture Imagery Program
NDOP	National Digital Ortho Program
NED	National Elevation Dataset
NFIP	National Flood Insurance Program
NHD	National Hydrography Dataset
NHDOT	New Hampshire Department of Transportation
NHOEM	New Hampshire Office of Emergency Management
NHOEP	New Hampshire Office of Energy and Planning
NSSDA	National Standard for Spatial Data Accuracy
RMC	Regional Management Center
SFHA	Special Flood Hazard Area
TIN	Triangulated Irregular Network
UNH	University of New Hampshire
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
WISE	Watershed Information System



# Scoping of Flood Hazard Mapping Needs for Carroll County, New Hampshire

By Robert H. Flynn

## Section 1. Introduction

This report was prepared by the U.S. Geological Survey (USGS) New Hampshire/Vermont Water Science Center for scoping of flood-hazard mapping needs for Carroll County, New Hampshire, under Federal Emergency Management Agency (FEMA) Inter-Agency agreement Number HSFE01-05X-0018. This section of the report explains the objective of the task and the purpose of the reports.

### Background

FEMA is embarking on a map modernization program nationwide to:

1. Gather and develop updated data for all flood prone areas in support of flood plain management.
2. Provide maps and data in a digital format for the improvement in the efficiency and precision of the mapping program.
3. Integrate FEMA's community and state partners into the mapping process.

One of the priorities for FEMA, Region 1, is to develop updated Digital Flood Insurance Rate Maps (DFIRMs) and Flood Insurance Studies (FIS) for Carroll County, New Hampshire. The information provided in this report will be used to develop the scope for the first phase of a multiyear project that will ultimately result in the production of new DFIRMs and FIS for the communities and flooding sources in Carroll County.

The average age of the FEMA flood plain maps in Carroll County, New Hampshire is 18 years. Most of these studies were computed in the late 1970s to the mid 1980s. However, in the ensuing 20–30 years, development has occurred in many of the watersheds, and the rivers and streams and their flood plains have changed as a result. In addition, as development has occurred, peak flooding has increased downstream of the development from increased flows across impervious surfaces. Therefore, many of the older studies may not depict current conditions nor accurately estimate risk in terms of flood heights.

Carroll County gained 3,773 residents between 2000 and 2005. This represents a growth of 8.6 percent compared to 6.0 percent for the state as a whole. Carroll County ranks second (from highest to lowest) out of New Hampshire's 10 counties in terms of rate of population increase. Since 1990, Carroll County has gained 12,029 residents (University of New Hampshire, 2006).

## Scope of Work

The following is the scope of work as defined in the FEMA/USGS Statement of Work:

Task 1: Collect data from a variety of sources including community surveys, other Federal and State Agencies, National Flood Insurance Program (NFIP) State Coordinators, Community Assistance Visits (CAVs) and FEMA archives. Lists of mapping needs will be obtained from the Mapping Needs Update Support System (MNUSS) database, community surveys, and CAVs, if available. FEMA archives will be inventoried for effective Flood Insurance Rate Maps (FIRM) panels, FIS reports, and other flood hazard data or existing study data. Best available base map information, topographic data, flood hazard data, and hydrologic and hydraulic (H&H) data will be identified and obtained. FEMA Letters of Map Change (LOMC) areas will also be identified.

Task 2: Contact communities in Carroll County to notify them that FEMA and the State have selected them for a map update, and that a project scope will be developed with their input. Topics to be reviewed with the communities include (1) Purpose of the Flood Map Project (for example, the update needs that have prompted the map update); (2) The community's mapping needs; (3) The community's available mapping, hydrologic, hydraulic, and flooding information; (4) Target schedule for completing the project; and (5) The community's engineering, planning, and geographic information system (GIS) capabilities. When requested by the community, or when needed to obtain information on mapping needs and available information, the USGS will schedule meetings with individual communities.

Based on the collected information from Task 1 and community contacts/meetings in Task 2, the USGS will develop a Draft Project Scope for the identified mapping needs of the communities in Carroll County. The following items will be addressed in the Draft Project Scope: review of available information; determine if and how the currently effective FIS data can be used in new project; identify other data needed to complete the Project and its source; and the DFIRM format. The Draft Project Scope will establish priority levels for flooding sources to be analyzed and mapped, and estimate schedules for completion of the components of flood mapping.

The USGS is to supply the FEMA Contracting Officer's Technical Representative (COTR) with a report summarizing the following:

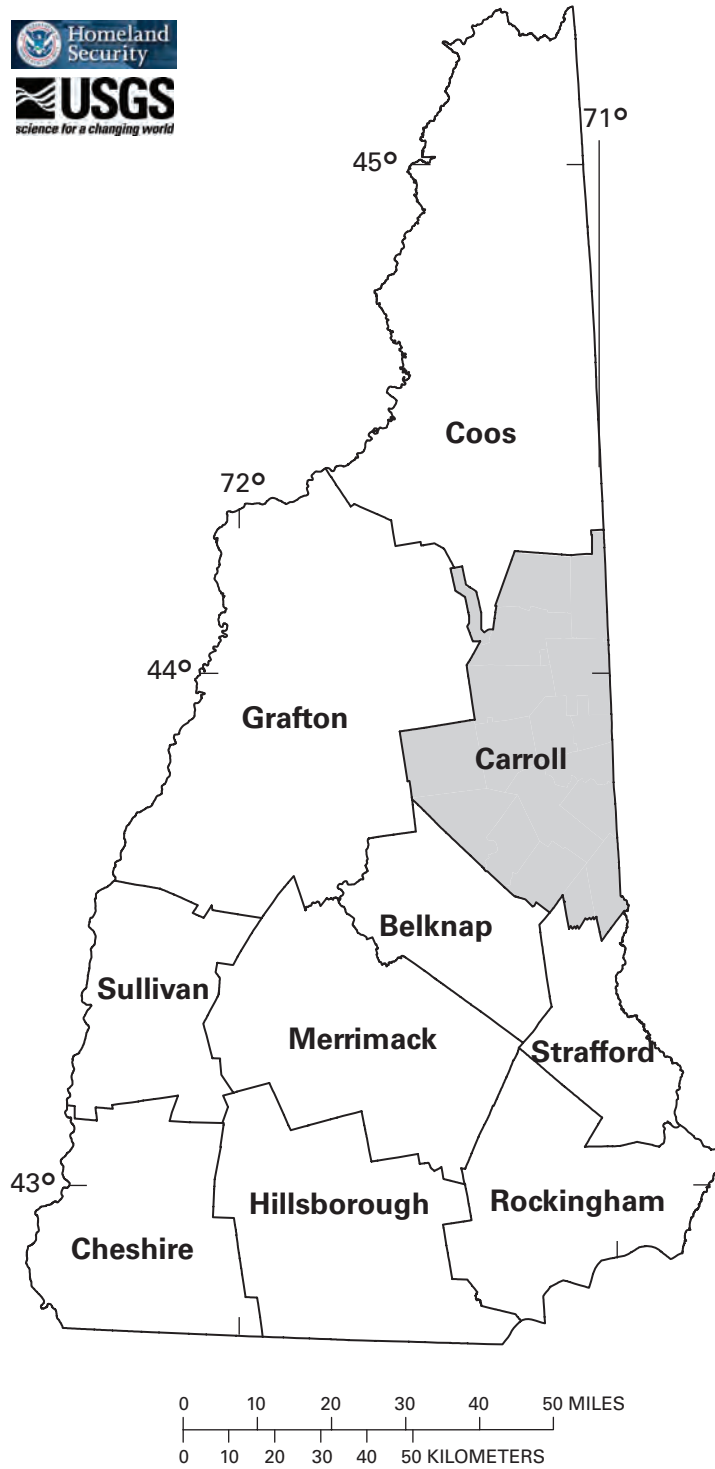
1. Available data and collected information on mapping needs.
2. Documentation of meetings and contacts.
3. Suitability of existing data and options for future mapping.
4. Restudy needs and priorities.
5. Recommended project scope and cost.

This report provides a summary of data-collection efforts conducted for this task, as well as information on available mapping/remote sensing data. The report includes recommendations for providing needed mapping/remote sensing data to accomplish the ultimate goal of producing new DFIRMs. It also provides options for accomplishing this goal within the context of FEMA's Cooperating Technical Partner (CTP) Program. The report begins the process of establishing restudy priorities in Carroll County.

The communities of Carroll County and their populations are listed in table 1, and the location of Carroll County in New Hampshire is shown in figure 1. The Carroll County Hydrography and FEMA DFIRM Data, county communities, rivers and streams and flood zones are shown in figure 2.

**Table 1.** Carroll County, New Hampshire, communities and populations.

<b>County/Town</b>	<b>Year 2000 population</b>	<b>Land area (square mile)</b>	<b>Population per square mile</b>
<b>Carroll County</b>	<b>43,666</b>	<b>934</b>	<b>46.8</b>
Albany	654	74.7	8.8
Bartlett	2,705	75.3	35.9
Brookfield	604	22.9	26.4
Chatham	260	56.7	4.6
Conway	8,604	69.7	123.4
Eaton	375	24.4	15.4
Effingham	1,273	38.5	33.1
Freedom	1,303	34.7	37.6
Hale's Location	58	2.4	24.2
Hart's Location	37	18.6	2.0
Jackson	835	66.9	12.5
Madison	1,984	38.7	51.3
Moultonborough	4,484	59.8	75.0
Ossipee	4,211	71.2	59.1
Sandwich	1,286	90.6	14.2
Tamworth	2,510	59.9	41.9
Tuftonboro	2,148	41.1	52.3
Wakefield	4,252	39.3	108.2
Wolfeboro	6,083	48.3	125.9

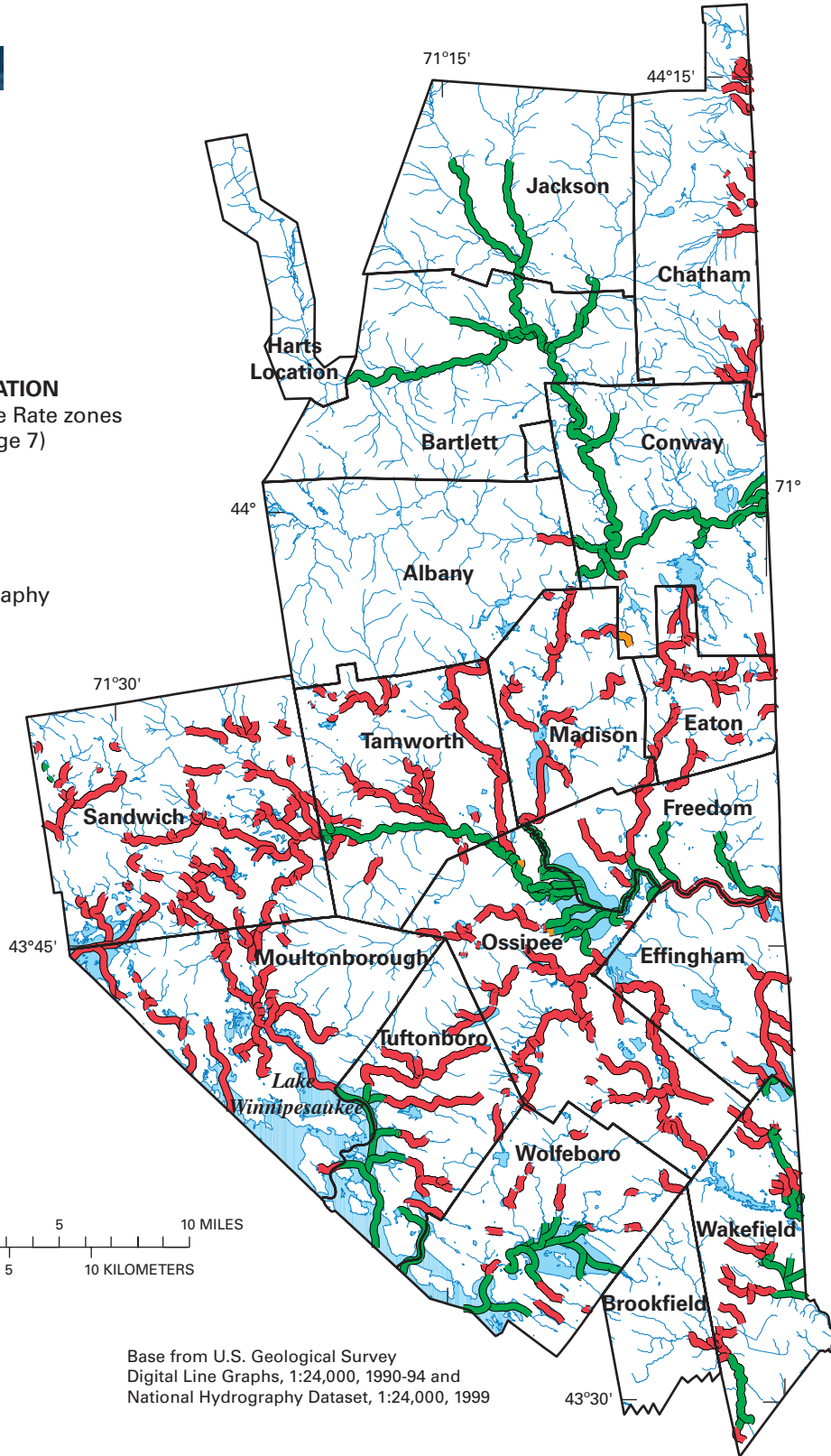


**Figure 1.** Carroll County, New Hampshire, location map.



**EXPLANATION**  
Flood Insurance Rate zones  
(See page 7)

- A
- AE
- X
- Hydrography



Base from U.S. Geological Survey  
Digital Line Graphs, 1:24,000, 1990-94 and  
National Hydrography Dataset, 1:24,000, 1999

**Figure 2.** Carroll County, New Hampshire, hydrography and FEMA Digital Flood Insurance Rate Map (DFIRM) data.

## Section 2. Data Collected from Carroll County Communities

This section provides a summary of the data-collection efforts for communities in Carroll County relating to the most recent community FISs and FIRMs; Letter of Map Amendments (LOMAs) and Letter of Map Revisions (LOMRs); information from the MNUSS database; and state and community meetings, and information on the location of existing remote-sensing data.

The flood-hazard information obtained in the data-collection efforts are summarized in figure 2, and include:

- State, county, and community boundaries.
- Water features.
- Limits of existing detailed and approximate study within Carroll County.

These maps can be continually updated in the future as new information becomes available.

### Community Flood Insurance Studies and Flood Insurance Rate Maps

A summary of FIS and FIRM dates for the communities located in Carroll County are listed in table 2.

**Table 2.** FIS and FIRM information for communities.

[FIS, Flood Insurance Studies; FIRM, Flood Insurance Rate Map; FHBM, Flood Hazard Boundary Map; NSFHA, No Special Flood Hazard Area; --, no data]

Community	Date of entry	FIRM/FHBM date	FIS date
Albany	3/1/1995	3/1/1995	--
Bartlett	5/1/1979	3/1/1984	3/1/1984
Brookfield	5/17/1977	5/17/1977	--
Chatham	1/3/1975	1/3/1976	--
Conway	4/16/1979	6/3/2002	6/3/2002
Eaton	1/17/1975	1/17/1976	--
Effingham	1/17/1975	1/17/1976	--
Freedom	12/1/1992	7/3/1995	7/3/1995
Hart's Location	3/2/1998	(NSFHA)	--
Jackson	7/2/1979	7/2/1979	7/2/1979
Madison	8/1/2005	11/29/1977	--
Moultonborough	3/1/2000	3/1/2000	--
Ossipee	6/17/1991	7/3/1995	7/3/1995
Sandwich	7/17/1986	9/2/1993	--
Tamworth	7/16/1991	7/16/1991	7/16/1991
Tuftonboro	5/4/1989	5/4/1989	5/4/1989
Wakefield	6/17/1991	6/17/1991	6/17/1991
Wolfeboro	5/17/1989	5/17/1989	5/17/1989

The effective map dates range from 1976 in the Towns of Chatham, Eaton and Effingham to 2002 in the Town of Conway. Fifty percent of the FIRMs were produced prior to 1989 and are 17 years old or older. The oldest FIRM is 29 years old, the most recent is 3 year old, and the average is 18 years old. Most (over 70 percent) of the FIS analyses were performed between 1976 and 1989 and have not been updated.

## **Delineation of Detailed and Approximate Study Areas**

Digital Q3 Flood Data have not been developed for Carroll County to determine the areas of detailed study (Zone AE) and areas of approximate study (Zone A) within the communities. FEMA digital Q3 flood data is the electronically scanned currently effective map panels of an existing paper FIRM. Digital FIRM Data were created and provided by the University of New Hampshire Geographically Referenced ANalysis and Information Transfer system (UNH GRANIT) (Jenn Merriam, written commun., October 14, 2005) for this report. These data had not been quality checked by FEMA's contractors as of the date received. GRANIT, a collaborative effort between the University of New Hampshire and the New Hampshire Office of Energy and Planning (NHOEP), is a cooperative project to create, maintain, and make available a state-wide geographic data base serving the information needs of state, regional, and local decision-makers. Definitions of flood insurance rate Zones A and AE are provided below:

- **Zone AE:** Zone AE is the flood insurance rate zone that corresponds to the 100-year flood plains that are determined in the FIS by detailed methods. In most instances, whole-foot base flood elevations (BFEs) derived from the detailed hydraulic analyses are shown at selected intervals within this zone.
- **Zone A:** Zone A is the flood insurance rate zone that corresponds to the 100-year flood plains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for these areas, no BFEs or depths are shown within this zone.
- **Zone X:** The flood insurance rate zone that corresponds to areas outside of the 500-year flood plain, areas within the 500-year flood plain, and to areas of the 100-year flood plain where average depths are less than 1 foot, areas of the 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No BFEs or depths are shown in this zone.

## **Letters of Map Change**

A LOMC is a letter issued by FEMA in response to a request to revise or amend an effective NFIP map to remove a property or reflect changed flooding conditions on the effective map. LOMCs may include LOMAs and LOMRs, as defined below:

- **LOMAs:** A LOMA is an official amendment, by letter, to an effective NFIP map. A LOMA establishes a property's location in relation to the Special Flood Hazard Area (SFHA). There is no appeal period for LOMAs, and the letter becomes effective the date that it is sent.
- **LOMRs:** A LOMR is an official revision, by letter, to an effective NFIP map. A LOMR may change flood insurance risk zones, flood plain and(or) floodway boundary delineations, planimetric features, and(or) BFEs. The effective date of a LOMR depends on the type of change requested. For example, some LOMR's are effective on the date that the letter is issued and others become effective following an appeal period (typically 30 to 90 days or 6 months).

- **LOMR-F:** A Letter of Map Revision based on Fill (LOMR-F) may be filed as a special case of the LOMR. A LOMR-F provides FEMA’s determination concerning whether a structure or parcel has been elevated on fill above the BFE and excluded from the SFHA. A LOMR-F is an official revision, by letter, to an effective NFIP map. The letter becomes effective on the date that it is sent.



In addition to the categories above, conditional LOMAs, LOMRs, and LOMR-Fs may be issued by FEMA to comment on a proposed project. The letter does not revise an effective NFIP map, but indicates whether the project, if built as proposed, would be recognized by FEMA.

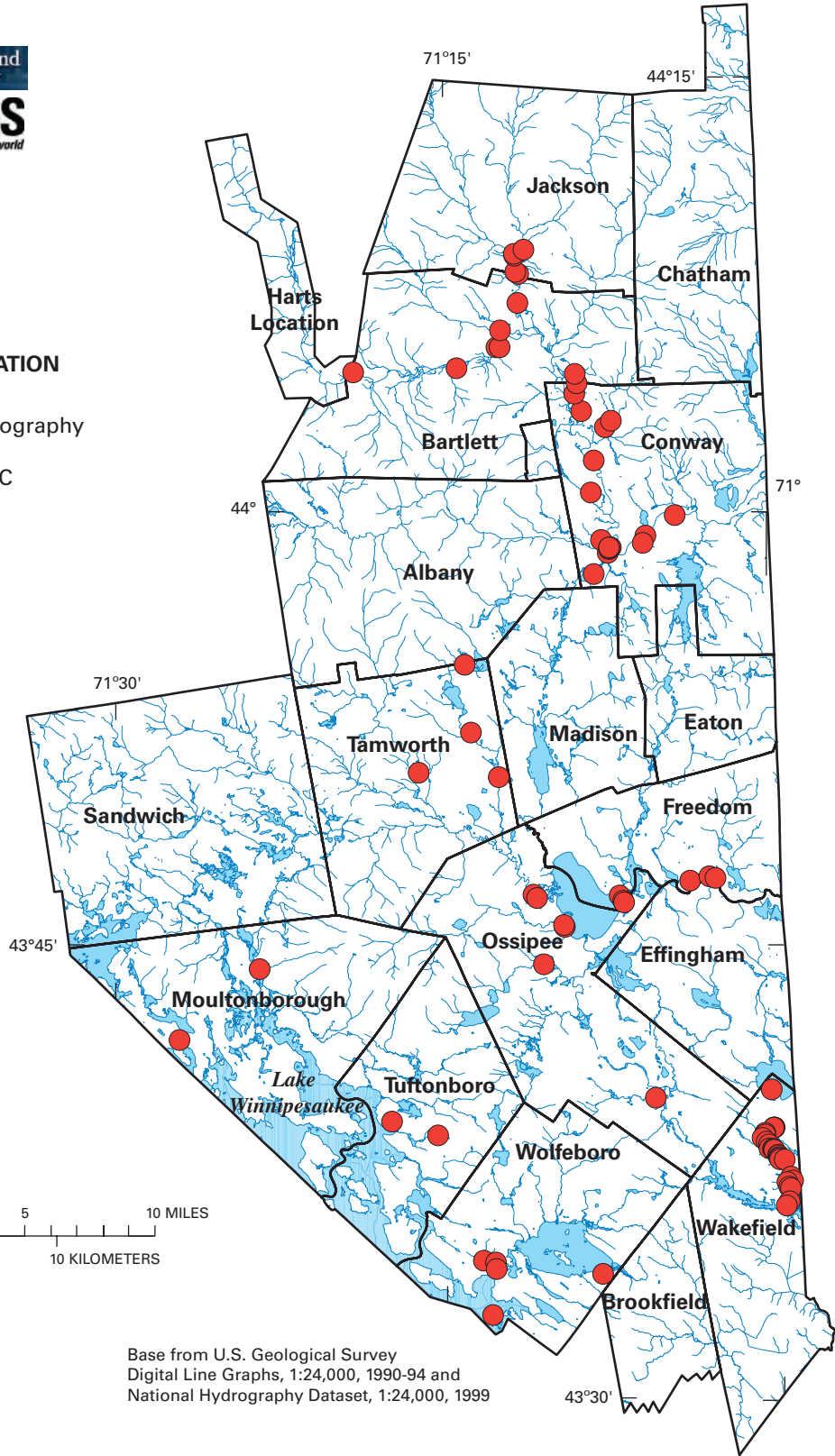
## **Letters of Map Change in Carroll County**

LOMCs were collected for each of the communities.

A summary of the LOMCs obtained from FEMA (<http://msc.fema.gov>) and the NHOEM is provided in appendix A. The summary table in appendix A includes the LOMC case number, effective date, flooding source, location, area/structure removed from SFHA, and new flood zone. The location of each LOMC is shown in figure 3.



**EXPLANATION**  
 Hydrography  
 LOMC



Base from U.S. Geological Survey  
 Digital Line Graphs, 1:24,000, 1990-94 and  
 National Hydrography Dataset, 1:24,000, 1999

**Figure 3.** Letter of Map Change (LOMC) and community location map in Carroll County, New Hampshire.

## **Mapping Needs Update Support System**

In accordance with section 575 of the National Flood Insurance Reform Act of 1994, FEMA assesses "...the need to revise and update all flood plain areas and flood-risk zones identified, delineated, or established based on analysis of all natural hazards affecting flood risks." FEMA initiated the Mapping Needs Assessment (MNA) process, which identifies and prioritizes flood-hazard mapping needs for communities nationwide. As part of this effort, FEMA developed the MNUSS, which is an interactive, web-based software application that maintains an inventory of needs for future map updates. In particular, MNUSS stores information on the following two types of update needs:

- **Map Maintenance Needs:** Includes changes to base map information, such as the addition of new roads, changes to corporate limits, and incorporation of LOMCs.
- **Flood Data Update Needs:** Includes changes to flood-hazard areas as a result of changes in H&H conditions, changes to BFEs, and(or) changes in the flood plain delineation.

Mapping needs may be viewed and entered into MNUSS by a variety of parties, including FEMA Headquarters and Regional offices, state NFIP coordinators, study contractors, CTPs, and other Federal agencies, such as the U.S. Army Corps of Engineers (USACE) and the USGS. All needs are reviewed and approved by the FEMA MNUSS controller prior to office entry into the system.

## **Mapping Needs in Carroll County, New Hampshire**

Information on mapping needs for the respective communities within Carroll County was downloaded from MNUSS on November 30, 2005, and is included in appendix B. This information included a summary of those communities that had and had not responded to requests for information on MNUSS mapping needs, as well as a summary of the map maintenance and flood-data-update needs, as appropriate, for those communities where responses had been received. A summary of the response status for each community and the general mapping needs are listed in appendix table B-1. Information on the specific community mapping needs is provided in table 3.

**Table 3.** Summary of specific mapping needs in Carroll County, New Hampshire.

[BFE, Base Flood Elevation; FIRMs, Flood Insurance Rate Maps]

<b>Community</b>	<b>Need identifier</b>	<b>Study category</b>	<b>Comments</b>
Albany	10568	Riverine	11x17 effective is “grossly” inaccurate and requires a restudy of the Swift River. Changes to hydraulic analysis with anticipated BFE increase of greater than 5 ft on 1.3 mi study reach of the Swift River.
Hart’s Location	29865	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE increase of between 1 and 5 ft on 1.0 mi study reach of Saco River from the confluence of Bemis Brook to the confluence of Nancy Brook. Community has requested FIRMs numerous times.
Hart’s Location	29866	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE increase of between 1 and 5 ft on 0.25 mi study reach of Sawyer River upstream from the Bartlett town line. This area is prone to flooding.
Ossipee	29721	Maintenance	Add streets to panels 0005B, 0006B, and 0030B.
Wakefield	29834	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE increase of between 1 and 5 ft on 2.4 mi study of Lovell Lake from outlet to inlet. BFE is requested due to development.
Wakefield	29827	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot on 1.7 mi study reach of Tributary 2 to Belleau Lake from the confluence of Belleau Lake to the corporate limit.
Wakefield	29815	Maintenance	Add streets to panels 0005A, 0010A, and 0015A.
Wakefield	29825	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot on 2.3 mi study reach of Belleau Lake Tributary from the confluence of Belleau Lake to the corporate limit.
Wakefield	29829	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot on 2.3 mi study reach of Scribner Brook from Route 16 to the confluence with Great East Lake.
Wakefield	29817	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot on 1.7 mi study reach of Sandy Pond and Tributaries from the outlet of Sandy Pond to the tributary headwaters.
Wakefield	29819	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot on 0.6 mi of Woodman Lake from outlet to inlet. New dam configuration on Belleau Lake affects Woodman Lake.
Wakefield	29822	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot on 1.5 mi of study reach of Pine River Pond Tributary from the northern end of Pine River Pond to the corporate limit.
Wakefield	29833	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot on 3.3 mi of Pine River Pond from outlet to inlet.
Wakefield	29832	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot on 1.5 mi of study reach of Horn Brook from Route 16 to Lovell Lake.
Wakefield	29831	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot on 3.4 mi of study reach of Copp Brook from Route 16 to the confluence with Great East Lake.
Wakefield	29816	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE increase of between 1 and 5 ft on 1.5 mi of Horn Pond from outlet to inlet.

**Table 3.** Summary of specific mapping needs in Carroll County, New Hampshire.—Continued

[BFE, Base Flood Elevation; FIRMs, Flood Insurance Rate Maps]

<b>Community</b>	<b>Need identifier</b>	<b>Study category</b>	<b>Comments</b>
Wolfeboro	29861	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot on 2.2 mi of study reach on Heath Brook from the town line to Pleasant Valley Road, due to development.
Wolfeboro	29859	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot on 0.89 mi of Front Bay from the southern end of Front Bay to the northern extent, due to development.
Wolfeboro	29860	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of between 1 and 5 ft on 0.57 mi of Harvey Brook from Route 109A downstream 0.57 mi, due to development.
Wolfeboro	29856	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot on 0.18 mi of Batson Pond due to development.
Wolfeboro	29858	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot on Crescent Lake from the inlet to Lake Wentworth due to change in dam and spillway.
Wolfeboro	29863	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot for 4.7 mi study reach on Willey Brook from 3,000 ft upstream on Pork Hill Road to Lake Wentworth, due to development.
Wolfeboro	29864	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot for 0.8 mi of Sargents Pond from North Line Road to confluence with Hersey Brook, due to development.
Wolfeboro	29857	Maintenance	Add streets to panels 0005A, 0010A, 0015A and 0020A.
Wolfeboro	29862	Riverine	Changes in hydrologic conditions and hydraulic analysis with anticipated BFE decrease of less than 1 foot for 1.3 mi of study reach on Townsend Brook from Warren Sands Road to Lake Wentworth, due to development.

As shown in table 3, a total of 13 mapping update needs are listed in MNUSS throughout Carroll County. These include six map maintenance needs and seven flood-data-update needs. Not all of the communities in the county responded to the FEMA request for information regarding mapping needs, so the actual number of mapping needs may be higher than what is currently reported in MNUSS. Additional information on mapping needs in the communities was established through state and community meetings, as discussed in the following sections.

## State and Community Meetings

As part of the scoping effort, the USGS conducted a series of meetings with the following State agencies and communities:

- NHOEM on August 24, 2005, to review LOMCs.
- Conference call kick-off meeting with NHOEM, FEMA, USGS, and Watershed Concepts on September 1, 2005.

The following section provides a summary of the key outcomes from each of the State and community meetings. Additional detail is given in appendix C, which provides copies of the meeting minutes and an example community interview form.

### Meeting with New Hampshire Office of Emergency Management (NHOEM) and Scoping Team Members

USGS held a kick-off meeting with a conference call on September 1, 2005, that included representatives from NHOEM, FEMA, USGS, and Watershed Concepts (RMC - Regional Management Center). The meeting was used to introduce the scoping project team and review roles and responsibilities. The meeting agenda and minutes are included in appendix C. The following people were included in the meeting:

- Dean Savramis, representing FEMA, provided an overview of the Map Modernization Program and Scoping. He also provided a description of the countywide approach.
- Brent McCarthy (RMC) described the role of the RMC in assisting FEMA and the mapping contractors. He described the Watershed Information System (WISE) (Watershed Concepts, 2005) computer applications developed for FEMA to standardize the scoping process methodology, data collection, and storage for the map modernization program. Brent mentioned that it may be a good idea to set up a morning and evening meeting with each County in order to be able to talk to all of the representatives in each town (two meetings for each county). Brent also mentioned that Watershed Concepts could lead breakout sessions with towns during the meetings with the Counties.
- Jeff Burm (RMC) spoke about the WISE Scoping tool and various features of this tool including community contact information, available GIS data, stream data, statistical analysis, stream mile information to calculate costs for hydrology and hydraulics, LOMAs, CAVs and Community Assistance Contacts (CACs), creation of reports for each of the items.
- Fay Rubin (UNH GRANIT), Craig Johnston, Laura Hayes and Robert Flynn (USGS)—discussed available data and coverages within New Hampshire (for example, 2003 National Agriculture Imagery Program (NAIP) color Digital Orthophoto Quadrangles (DOQs)). Remote sensing, base map information, GIS data (for example, contour data, E911 data, Digital Elevation Model (DEMs), buildings layer, survey data available from the New Hampshire Department of Transportation (NHDOT). In addition, the county regional planning commissions were mentioned as possible sources of data.

## Carroll County Community Meetings

Conference calls were conducted with representatives from all of the towns in Carroll County. The following sections provide a brief summary of the key findings from each community interview, and in particular, identifying areas with increased development, areas with known flooding problems, and areas with changes to hydraulic structures. The applicable community contacts are also provided in each section.

The goals of these meetings were to:

- Inform the communities of the nature and the intent of the flood map update process.
- Solicit community input and discuss the flood-prone areas that communities would like to include as a part of the flood map update.

Community comments were captured on paper interview forms, FIRM panels, and on working maps of each community produced for this purpose. These comments were entered into the WISE scoping application. Notes from the working maps and FIRM panels are summarized on figure 3. For communities not represented at the meetings, information provided by NHOEM, and contained in the community business plan was relied upon.

### **Carroll County:**

#### Albany

The following list provides a summary of the key issues identified during the community interview (February 21, 2006):

- No new studies needed. Limited development and mostly National Forest.
- Many road names are incorrect and roads are missing from the FIRM.

Contact: Diane Falcey, Administrative Assistant (603-447-6038)

#### Bartlett

The following list provides a summary of the key issues identified during the community interview (November 21, 2005, February 17, 2006, July 14, 2006, and July 18, 2006):

- Many road names are incorrect and roads are missing from the FIRM.
- On panels 5, 10, and 20, the Saco River needs a detailed restudy from the western corporate limit to the southern corporate limit due to filling-in, erosion and meandering of the river which is also experiencing development. In one location, fill was placed in the river in the vicinity of Humphrey's Ledge along West Side Road in the Saco River. In another location (end of Forest Avenue), there is a berm that is eroding and threatens flooding of homes in this area along the Saco River.
- On panels 10 and 15, a limited detailed study is needed along the East Branch Saco River from its confluence with the Saco River to the upstream corporate limit. At the Woodland Pine and Foxrun Condominiums flooding has occurred but is not shown on the flood maps. In the upstream reach of the river, the channel has moved. Re-channeling was done in the 1970's along with other work to slow velocities and stabilize banks but, the channel is moving back to its old location.

Contact: Doug Garland, Selectman, Lynn Jones, Administrative Assistant to the Selectmen, Brenda Medeiros, Secretary to the Board of Selectmen (603-356-2950)

## Brookfield

The following list provides a summary of the key issues identified during the community interview (November 21, 2005 and February 17, 2006):

- On panel 7, a detailed study is requested on Churchill Brook from Governor's Road to confluence of Pike Brook due to development and inaccurately defined Zone A boundary (i.e. Sanborn Road bridge does not overtop).
- On panel 7, a detailed study is requested on Pike Brook from Route 109 to the downstream corporate limit due to development and inaccurately defined Zone A boundary.

Contact: Bob Leonard, Selectman and Pam Fraser, Assessing Clerk (603-522-3688)

## Chatham

The following list provides a summary of the key issues identified during the community interview (January 5, 2006):

- No new studies needed. There are many new roads that need to be added to the flood maps.

Contact: Wayne McAllister, Chairman of the Board of Selectmen (603-694-3827)

## Conway

The following list provides a summary of the key issues identified during the community interview (February 17, 2006):

- On panel 20, a limited detailed study is needed on the Saco River and Middle River from BFE 470 (downstream of section AJ) to BFE 484 (upstream of section AM) due to large amounts of erosion by the Saco River. In one area, just north of Justamere Road, an approximately 50 ft length of bank has eroded. In addition, two New Hampshire State bridges on River Road crossing the Middle and Saco Rivers, have been reconstructed by the New Hampshire Department of Transportation and this may have changed the flood width in this area.
- On panel 25, the New Hampshire Department of Transportation plans to reroute Kearsarge Brook from section J to section O. This is planned to take place between 2006 and 2014 for the by-pass construction. Homes are being removed or will be completely removed by the time construction takes place. A detailed study is needed from BFE 505 (Patten Court) to Whitaker Lane.
- On panel 25, the town has seen an increase in potential LOMAs along a 1,000 ft reach of the Eastern Slope Terrace (off of Route 16) as a result of development in this area. Remapping of the flood boundary along the eastern side of the Saco River between BFE 459 and BFE 460 is needed.
- On panel 30, (high priority) a limited detailed study and remapping are needed for a reach of the Saco River between Section B (BFE 415) and the intersection of East Conway Road and Webster Road at the downstream corporate limit (BFE 413) as the town states that there is a discrepancy between the elevations along this reach in Conway and the elevations in Freyburg, Maine, to the east of the panel. The flood plain boundary is shown as being cut off at Route 113 between Sections A (BFE 414) and Section B (BFE 415) however, flooding does occur over this road. Development is occurring along this road. Development is also occurring along Saco River Road and there is a request to develop this area further but clarification needs to be made on the Base Flood Elevations due to the discrepancy with the Freyburg, Maine panel.

- On panel 30, (2nd highest priority) remapping is requested along the Saco River from BFE 415 to BFE 419 due to questionable accuracy of the flood delineation in this area.
- On panel 35, remapping is requested along the south side of Pequawket Pond along Pequawket Drive from west of “E” Street to “J” Street as the town states that the elevation along the south side of Pequawket Drive is lower than the elevation along the north side of Pequawket Drive and the flood delineation does not extend to the south side of Pequawket Drive. The Town would like to know if the flood boundary really follows the middle of Pequawket Drive or are there areas where the elevation is lower than the south side of the road. The town states that property owners are having a difficult time determining if they are or are not in the flood plain. The flood boundaries for Pequawket Pond were determined in the 2002 Conway, N.H. flood study using a 5-ft contour interval base map which was based on a 1:600 aerial photography that was flown and compiled in 1991. The 5-ft contour interval data is the best available data.
- On panel 45, remapping is requested for the Saco River along Rebecca Lane up to Saco Pines Road. Development is occurring, especially in the area west of Saco Pines Road where the flood plain touches East Main Street.
- On panel 45, a detailed study is requested along Black Cat Brook from Route 302 to the Maine Central Railroad due to development along Essex Road.

Contact: Thomas Irving, Planning Director, (603-447-3855)

## Eaton

The following list provides a summary of the key issues identified during the community interview (February 21, 2006 and June 15, 2006):

- On panels 2 and 4, a detailed study is requested for Conway Lake due to development along the eastern boundary of the lake and inaccurate boundary for current Zone A.
- On panel 4, a detailed study is needed along Snow Brook from its confluence with Conway Lake to its’ second crossing of Potter Road (upstream of Conway Lake, at the panel 3 and 4 boundary) due to a new bridge at the Potter Road crossing nearest to Conway Lake (from a culvert to wing-span bridge) and inaccurately delineated Zone A.

Contact: David Maudsley, Secretary to the Board of Selectmen (603-447-2840).

## Effingham

The following list provides a summary of the key issues identified during the community interview (February 17, 2006 and July 18, 2006):

- Many road names are incorrect and roads are missing from the FIRM.
- No new studies needed.

Contact: Claudia Lamphier, Administrative Assistant (603-539-7770)

## Freedom

The following list provides a summary of the key issues identified during the community interview (February 21, 2006, July 13, 2006, July 18, 2006, and July 25, 2006):

Many road names are incorrect and roads on the FIRM either don’t exist or are missing.



- On panel 10, the Cold Brook does not flood across Moulton Road but, it is shown to do this on the flood map. This is located at the intersection of Moulton Road and Cushing Corner Road (named Andrew Hill Road on flood map). The Cold River needs to be redelineated in this area.
- On panel 10, the delineation of area to the north of Cold Brook needs to be checked as area is not prone to flooding.
- On panel 10, the delineation of the area to the north of Ossipee River (at the confluence of Cold Brook) needs to be checked as area is not prone to flooding.
- On panel 10, the flood delineation in Zone A is thought to be incorrect. Between approximately 92 and 207 Freedom Point Road, flooding occurs to approximately 200 ft to the north from the river and then the bank becomes very steep.
- On panels 10 and 15, between Berry and Broad Bay, flooding occurs beyond shoreline (as shown on Zone A) to the north. Development is occurring along the northern side of the Ossipee River.
- On panel 15, the area to the north of the confluence of Ossipee Lake and Ossipee River floods several times a year out to the corner of Diprizio Road and Totem Pole Road. The eastern end of this designated reach also floods out to Diprizio Road.

Contact: Karen Hatch, Administrative Assistant (603-539-6323)

## Jackson

The following list provides a summary of the key issues identified during the community interview (November 21, 2005, March 1, 2006, and July 13, 2006):

- On panel 25, in Jackson Village, business expansion has been hindered due to the flood boundaries and some question whether the boundaries are correctly delineated (Ellis River, Wildcat Brook and two unnamed brooks).

Contact: Tracy Mosston, Administrative Assistant (603-383-4223)

## Madison

The following list provides a summary of the key issues identified during the community interview (November 21, 2005):

- On panel 1, a detailed study is needed for Davis Pond due to development around pond.

Contact: Bob Babine, Code Official/Building Inspector (603-367-4332)

## Moultonborough

The following list provides a summary of the key issues identified during the community interview (February 21, 2006 and June 11, 2006):

- The Town Administrator feels that with the exception of the water bodies (lakes, ponds), all of the Zone A rivers and streams in the town of Moultonborough are delineated incorrectly as the delineation does not reflect the topography. This is a mountainous community and the town administrator feels that the flooding that is depicted for the rivers and streams either does not occur or is inaccurately delineated.

- Better contour data is needed. A base map was created for the town by Cartographic Associates from data collected in April of 2004 and perhaps this data can be used to create a better contour map for flood plain delineation.
- There are no specific areas of dense development in the town and the Town Administrator felt that he could not prioritize a flood study of one Zone A stream over another.

Contact: Chuck Connell, Town Administrator (603-476-2347)

## Ossipee

The following list provides a summary of the key issues identified during the community interview (February 17, 2006):

- No new studies needed. No issues with the flood maps.
- There are no major subdivisions built in town nor are there any planned.
- Town has a flood plain ordinance in place with elevation limitations. They also follow the State of New Hampshire's septic system regulations so no one is allowed to build below 414 ft elevation.
- Future building is a middle school and shopping area but will be complying with flood plain ordinance.

Contact: David Senecal, Building Inspector and Zoning Enforcement Officer (603-539-4181)

## Sandwich

The following list provides a summary of the key issues identified during the community interview (February 17, 2006):

- No new studies needed. No issues with the flood maps. Town Selectmen also looked at flood maps.

Contact: Cathy Crockford, Administrative Assistant (603-284-7701)

## Tamworth

The following list provides a summary of the key issues identified during the community interview (June 20, 2006):

- On panel 5, a detailed study is needed along the Chocorua River from Chocorua Lake to the northern corporate limit due to potential development along Washington Hill Road and Route 16.
- On panel 10, remapping is needed along the Bearcamp River between BFE 438 and BFE 450 as there is development potential along the southern side of the river and it is thought that the mapping is not accurate in this area.
- On panel 20, remapping is needed in the location of section X (BFE 576) to section AA (BFE 591) where Jackman Pond Road crosses the Bearcamp River as it is thought that the mapping is not correct in this area.
- On panel 20, a limited detailed study is needed from section O (BFE 510) to section V (BFE 573) as the dam (at BFE 545) was removed in 2003.

Contact: John Mersfelder, Tamworth Conservation Commission (603-284-7701)

## Tuftonborough

The following list provides a summary of the key issues identified during the community interview (February 17, 2006):

- No new studies needed. No issues with the flood maps.

Contact: Jackie Rowlands, Tax Collector (603-569-4539)

## Wakefield

The following list provides a summary of the key issues identified during the community interview (February 17, 2006):

- No new studies needed. No issues with the flood maps.

Contact: Robin Frost, Town Administrator (603-522-6205)

## Wolfeboro

The following list provides a summary of the key issues identified during the community interview (March 1, 2006):

- On panel 5, flooding does not occur over Governor Wentworth Highway (Route 109) from Lake Wentworth.
- On panel 5, flooding does not occur over Suncook Valley Road in either of these two areas.
- On panel 5, the area of flooding along Ryefield Brook (north of Lake Wentworth) is more extensive than shown. There is also a new bridge (NHDOT, 2005) over Ryefield Brook along Governor Wentworth Highway (Route 109).
- On panel 10, flooding does not occur over Cotton Valley Road from Ryefield Brook.
- On panel 15, flood extent on Harvey Brook is greater than shown and needs to extend over Beach Pond Road (incorrectly spelled as “Beech” on flood map).
- On panels 5 and 15, there are 6 islands in Lake Wentworth that are shown to be in the flood plain and they are not in the flood plain.
- On panel 15, there are 5 islands in Lake Winnepesaukee that are shown to be in the flood plain but they should not be in the flood plain.
- On panel 15, a new dam was put in at Crescent Lake in 2002 and this may have changed the flood boundaries for this lake. Development is occurring all around this lake.
- On panel 15, A new bridge was constructed by NHDOT on Suncook Valley Road over stream connecting Front Bay and Crescent Lake in 2006.
- On panel 15, the town feels that delineation is not accurate for Front Bay based on topography. Also, the owner of the dam (located to the east of Front Bay) plans to remove it. There is a new culvert constructed under Bay Street in 2005 and the town feels that this will change the flood boundary in this location.

Contact: Rob Houseman, Town Planner (603-569-5970)

## Available Digital Mapping and Remotely Sensed Data

This section provides an inventory of the digital data available to support the production of DFIRMs for the study area. Basic information is provided on the content, lineage, and accuracy of the products.

### Data-Collection Efforts

To determine the availability of digitally available data, the USGS contacted Lynn Bjorklund (New England Liaison to USGS National Mapping), Fay Rubin (GIS Manager, NH GRANIT, UNH Complex Systems Research Center), Lakes Region Planning Commission, the North Country Council Regional Planning Commission (NCCouncil), and the communities themselves. The NH GRANIT has useful base mapping.

### NH GRANIT Data Sources

NH GRANIT is a cooperative project to create, maintain, and make available a statewide geographic database serving the information needs of state, regional, and local decision-makers. A collaborative effort between the UNH and the NHOEP, the core GRANIT system is housed at the UNH Institute for the Study of Earth, Oceans, and Space in Durham.

NH GRANIT maintains data layers (<http://www.granit.sr.unh.edu>) including features such as roads, streams, and political boundaries. Some of the base map data layers maintained by NH GRANIT have been derived from USGS data and represent many of the feature types found on USGS topographic maps. More recently developed data were derived from digital orthophotos providing improved base map accuracy.

NH GRANIT is presently converting the standard, paper FIRMs and Flood Boundary and Floodway maps (FBFMs) to DFIRMs by digitizing existing flood maps from the existing paper flood maps. The DFIRMs will depict flood risk information, and include 100- and 500-year flood plain boundaries as well as areas of minimal flood risk. NH GRANIT is using USGS 1998 DOQs as the base, and they are incorporating any LOMC that are on file with FEMA.

The Q3 flood-data product is a digital representation of certain features of FEMA's FIRM product and are created by scanning the effective FIRM paper maps and digitizing selected features and lines. The digital Q3 flood data contain the following:

1. 1-percent (100-year) and 0.2-percent (500-year) annual chance flood plain boundaries (including velocity zones),
2. Flood insurance zone designations,
3. Floodway boundaries (where available),
4. Political boundaries (State, county, and community),
5. Community and map panel identification numbers,
6. FIRM panel neatlines,
7. USGS 7.5-minute (1:24,000 scale) series topographic map neatlines, and
8. Coastal Barrier Resources System areas.

## Community Data Resources

The USGS and NH GRANIT do not have digital base mapping data for Carroll County that meet FEMA requirements for DFIRM production. Community data requests were limited to topographic data suitable for hydraulic modeling (for example, 4-ft contours).

Topographic data are limited to that found on USGS topographic maps with 10 or 20-ft contour intervals. No other community sources of digital elevation data for FEMA flood mapping were located.

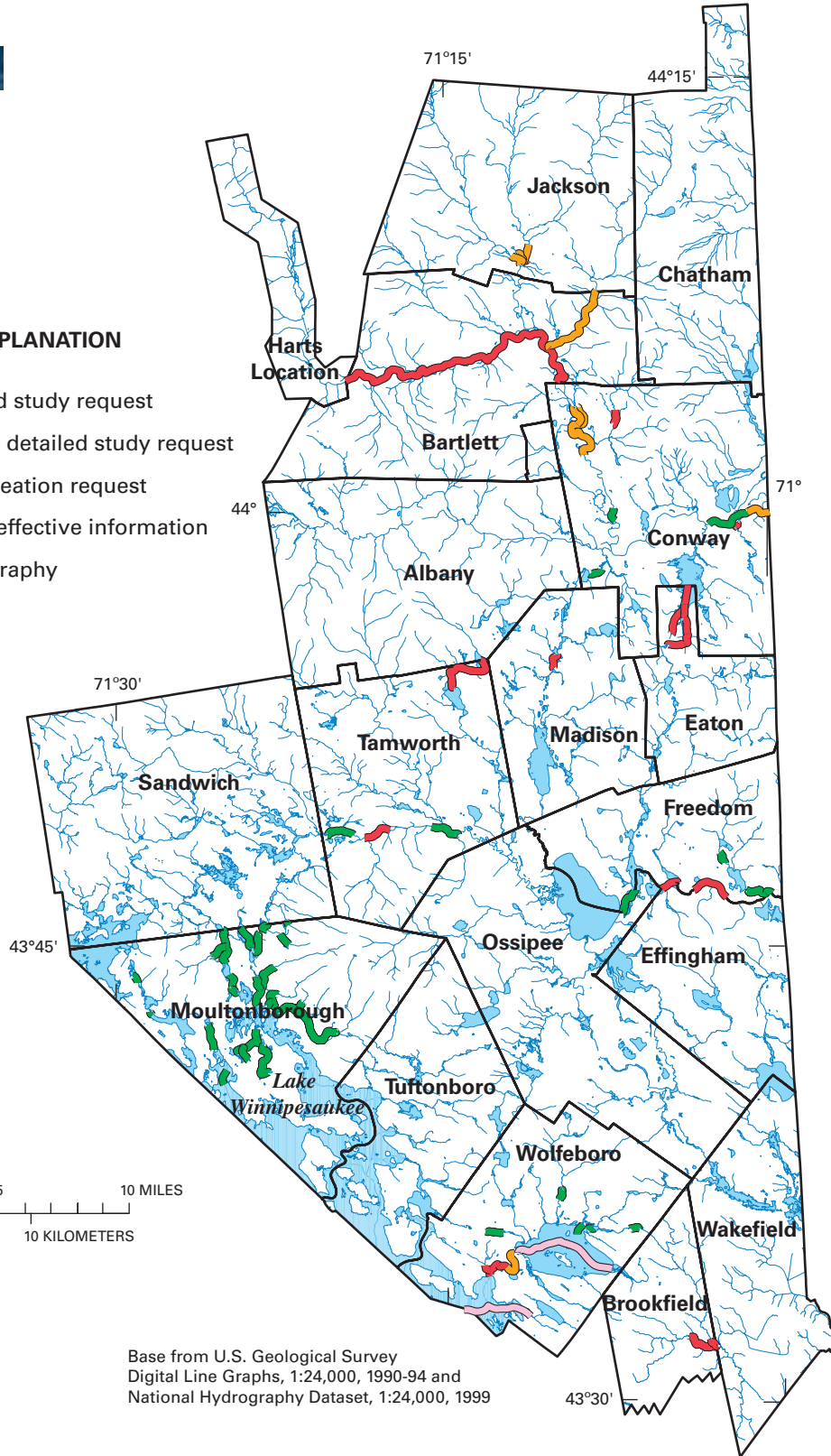
## Stream Final Coverage Output

The WISE Scoping Tool organizes and stores data and assists in the prioritization of the community requests for flood plain studies. As the scoping process is completed, three coverages (maps) are created: Effective, Meeting, and Stream Final.

- **Effective Coverage:** Q3 flood-hazard data are not available for Carroll County. NH GRANIT has a contract with FEMA to digitize the FIRMs and they made these nearly completed DFIRMs available to the USGS for purposes of scoping. The DFIRM data for Carroll County was received from NH GRANIT on October 15, 2005, although it had not been Quality Assurance/Quality Control checked at that time. Users of the WISE tool should obtain an updated version of the DFIRM data when it becomes available in December of 2006. The DFIRM information was entered into the WISE scoping tool. The initial Scoping Tool database was set up using the U.S. Environmental Protection Agency (USEPA) National Hydrography Dataset (NHD) stream centerline coverage (<http://nhd.usgs.gov/data.html>) and digital flood boundary base mapping data provided by NH GRANIT. The NHD stream centerline coverage was used to build the Effective Coverage in the Scoping Tool. The digitized flood-hazard data were overlain onto the NHD stream centerline coverage. The Scoping Tool was used to enter each reach of the Effective Coverage one at a time by assigning the beginning and end of each reach and the current effective type of study.
- **Meeting Coverage:** The Effective Coverage was used to prepare the work maps for recording mapping needs requested by the communities during the Scoping Meetings. These requests were also recorded in the Meeting Coverage of the Scoping Tool.
- **Stream Final Coverage:** The WISE Scoping Tool was used to create a Stream Final Coverage to document and highlight community meeting results. Community mapping needs based on community input are summarized in figure 4.

**EXPLANATION**

- Detailed study request
- Limited detailed study request
- Redelineation request
- Use of effective information
- Hydrography



Base from U.S. Geological Survey  
 Digital Line Graphs, 1:24,000, 1990-94 and  
 National Hydrography Dataset, 1:24,000, 1999

**Figure 4.** Carroll County, New Hampshire, stream final coverage.

## Section 3. Options for Future Mapping and Digital Terrain Model Preparation

### Mapping Requirements

This section provides an assessment of the costs and benefits of utilizing the data cataloged in the previous section for the preparation of DFIRMs for Carroll County. Options are presented for using these data sets in various combinations and supplementing them with new data sets.

DFIRMs are produced from the following three broad categories of geospatial data: (1) Base Map, (2) Digital Terrain Model (DTM), and (3) Flood Insurance Risk Zones. The spatial accuracy of each of these three categories is fixed by the specifications contained in the “Guidelines and Specifications for Flood Hazard Mapping Partners,” April 2003 (Federal Emergency Management Agency, 2004).

- **Base Maps:** Base maps (1998 DOQs) are being acquired from NH GRANIT and will be used by FEMA as the background to the flood insurance risk zones shown on the DFIRMs.
- **DTMs:** DTMs are used in conjunction with H&H models to interpret the limits of flood insurance risk zones.
- **Flood Insurance Risk Zones:** Geographic boundaries produced by FEMA.

### Base Map

Base maps are defined in the “Guidelines and Specifications” as the “map of the community that depicts cultural features (for example, roads, railroad, bridges, dams, and culverts), drainage features, and corporate limits.” Depending on the source of the base map, the specific features found on DFIRMs may include the following data and features:

- Roads: centerlines, edge-of-pavement, right-of-way, names.
- Railroads: names.
- Bridges: names.
- Flood Control Structures: headwall, dam, levee, names.
- Airport Boundaries: names.
- Rivers: centerlines, banks, names.
- Streams: names.
- Lakes: names.
- Political Boundaries: county, municipality, special districts, wards, military reservations, Native American lands, names.
- Land Use: parks, individual land parcels, names.

The “Guidelines and Specifications” specify “absolute horizontal accuracy” for base map features to establish horizontal accuracy for the position of the digital data set to its actual location on the earth’s surface. The horizontal accuracy is specified as a statistical error distribution at the 95-percent confidence level and is specified in the “Guidelines and Specifications” as a function of finished map scale, as shown in table 4:

**Table 4.** FIRM Horizontal Accuracy.

[FIRM, Flood Insurance Rate Map]

<b>FIRM map scale</b>	<b>Absolute horizontal accuracy at the 95-percent confidence level, in feet</b>
1 in = 500 ft	19.0
1 in = 1,000 ft	38.0
1 in = 2,000 ft	45.6

## Digital Terrain Models

FEMA typically develops DTMs for the production of DFIRMS as they are not widely available at the accuracies required by FEMA. The DTMs are used in conjunction with H&H models to interpret flood boundaries and can be used by the community for many purposes other than flood management. DTMs represent terrain with irregularly spaced spot elevations (x,y,z) and breaklines that indicate changes in ground slope at features such as the toe or top of channel banks or ridge lines. These data sets are generally photogrammetrically compiled by a mapping contractor from stereo photos and utilized in the form of a Triangulated Irregular Network (TIN) or a DEM. A DEM uses a regular grid, or raster, spacing of (x,y,z) points to represent the land surface. Each grid cell is assigned an average elevation to represent the elevation of the ground that is covered by the grid cell. A DEM represents the terrain surface with a mesh of regularly spaced points, whereas a TIN uses contiguous triangular planes.

Federal Emergency Management Agency (2004) “Guidelines and Specifications” identify the following four types of DTMs: (1) Digital contours, (2) DEMs, (3) Mass points and breaklines, and (4) TIN. Each of these models can be created from the other and their use is application dependent.

Under FEMA guidelines, the allowable DTMs are as follows:

1. Digital contours: continuous, nonintersecting lines of equal elevation separated by a specified elevation interval.
2. DEM: x, y, and z coordinates of regularly spaced points that form a grid.
3. Mass Points and Breaklines: x, y, and z coordinates of irregularly spaced points.
4. TIN: contiguous triangles with x, y, and z values at the vertices and faces with slope and aspect.

The “Guidelines and Specifications” specify what is referred to as “absolute vertical accuracy” for DTMs, which relates the elevation of the land surface in the digital data set to its actual elevation relative to a specific vertical datum. The National Standard for Spatial Data Accuracy (NSSDA) is specified as a statistical error distribution at the 90- and 95-percent confidence level as a function of the specified contour interval as shown in table 5.

**Table 5.** National Standard for Spatial Data Accuracy.

[NSSDA, National Standard for Spatial Data Accuracy, all values are in feet]

<b>Contour interval</b>	<b>NSSDA</b>	
	<b>90-percent confidence interval</b>	<b>95-percent confidence interval</b>
2	1	1.2
4	2	2.4



Contouring and DEMs are not printed on DFIRMS so their vertical accuracy is not labeled on the DFIRMS, but it is recorded in the metadata of elevation datasets used for H&H modeling.

## Flood Insurance Risk Zones

Flood insurance risk zones are created by FEMA to set insurance rates and manage the flood plain. Flood insurance risk zone accuracy requirements are not specified in the Guidelines and Specifications but can be described in terms of the combined accuracies of the base map, DTM, and the hydrology and hydraulic simulation models.

## Suitability of the Available Data

The following section provides a summary of the suitability of the base map and DTM available for Carroll County, N.H., from the appropriate community, county, and state resources.

### USGS of GRANIT

The USGS and NH GRANIT can provide digital data base mapping data for Carroll County that meets FEMA requirements for DFIRM production. Neither USGS nor NH GRANIT has elevation data suitable for hydraulic modeling and communities were contacted to find topographic or elevation data suitable for hydraulic modeling (for example, 2-ft or 4-ft contours).

### Community Data Resources

No community sources of digital elevation data for hydraulic modeling or FEMA flood mapping were located.

### County Data Resources

Carroll County does not contain suitable data for DFIRM use. Towns in Carroll County are within the planning area of the Lakes Region Planning Commission and the North Country Council Regional Planning Commission (NCCouncil). Each of the planning commission's data for DFIRM use was obtained from NH GRANIT.

### Base Map

NH GRANIT maintains data layers including features such as roads, streams, and political boundaries. Base map layers maintained by NH GRANIT include features such as roads, streams, and political boundaries. Base map data layers have been acquired from a variety of sources including the USGS data and represent many of the feature types found on USGS topographic maps. More recently developed data were derived from the digital orthophotos providing improved base map accuracy.

There are three base map sources available (table 6). These include the USGS DOQs (1:12,000; 1998, 1992) and NAIP Aerial Photographs (1:40,000; 2003). Existing coverages maintained by NH GRANIT can be linked to or viewed at the following Web site: <http://www.granit.sr.unh.edu>

**Table 6.** Currently available high resolution orthophotography for Carroll County.

[USGS, U.S. Geological Survey; DOQQ, Digital Orthophoto Quarter Quad; B&W, Black and White; NAIP, National Agricultural Imagery Program, NH GRANIT, New Hampshire Geographically Referenced Analysis and Information Transfer System]

Item	Source	Date	Resolution	Coverage
USGS DOQQ B&W	USGS	1998, 1992	1.0 meter pixel	Statewide
NAIP 2003 Color	NH GRANIT, NAIP	2003	1.0 meter pixel	Statewide

USGS Digital Ortho Quarter Quads (DOQQs) are available for all of Carroll County. The DOQQs are FEMA’s default standard for the base map. The accuracy and quality of the DOQQs meets National Map Accuracy Standards at 1:12,000 scale for 3.75-minute quarter quadrangles, plus or minus 33.33 ft or 10 m. For Carroll County, the DOQQ orthophotos are dated 1998 and are 1.0-m resolution.

The NAIP 2003 color orthophotos were created by the Aerial Photography Field Office (APFO) of the U.S. Department of Agriculture (USDA) and processed by NH GRANIT to (1) standardize the exterior “nodata” values; (2) re-project the data into New Hampshire State Plane Feet (North American Datum of 1983 (NAD 83)); (3) tile the data to 15-minute quadrangles to facilitate distribution; and (4) re-compress the data to MrSID Generation 3 format. The source product is 1-m ground sample distance (GSD) DOQQs from the National Digital Ortho Program (NDOP). The imagery may contain as much as 10-percent cloud cover per source photograph.

#### Digital Terrain Model

NH GRANIT has the DEM USGS National Elevation Dataset (NED) available for download. NH GRANIT extracted the NED and re-projected the files into NAD 83. The data are based on USGS 7.5 minute DEMs (30m x 30m square grids). The DEMs were derived from USGS 1:24000 and 1:25000 quadrangle maps.

#### Flood Insurance Risk Zones

FEMA flood insurance rate 100- and 500-year flood zones are being converted to digital data layers by NH GRANIT for each community participating in the NFIP in New Hampshire. These datasets were developed by direct digitization of FIRM maps using data registration techniques that produced the best-fit registration to community boundaries or other suitable features.

### Mapping Options

The following section provides a summary of the potential options for developing base maps, DTMs, and flood insurance risk zones.

#### Base Map

Three base map options are presented for consideration:

1. Use existing USGS DOQQs from 1998 and 1992.
2. Use NAIP 2003, 1.0-m resolution color orthophotos.
3. Produce new vector data.

The recommended option for DFIRM production in Carroll County is option #1.

## Digital Terrain Model

There are no DTM data available that meet FEMA requirements for Carroll County.

DTM development options include (1) obtaining countywide DTM data that covers all communities and (2) obtaining DTM data only for selected flood plain areas as needed to support a detailed study, limited detailed study, restudy or re-delineation of flood-hazard areas.

The estimated costs of obtaining new DTM data is shown in table 7. These costs are based on the information determined by Camp, Dresser, and McKee, Inc. (2004) in their 2005 Scoping Report for Rutland County, Vermont. The estimates include the cost of the LiDAR (Light Detection and Ranging) imaging system work and the associated aerial photography work needed to create break line data.

**Table 7.** Estimate of costs to obtain Digital Terrain Model data (2-ft contours).

<b>Area (square miles)</b>	<b>Unit cost (\$ per square mile)</b>	<b>Estimated cost</b>
20	5,000	\$100,000
50	3,000	\$150,000
75	2,250	\$168,750
100	2,000	\$200,000
934 (All of Carroll County)	1,250	\$1,167,500

Obtaining DTM data on a countywide basis is expensive. Most of the acquired data would be outside of the flood plain and not needed for hydraulic analysis. If FEMA obtains new DTM data for selected areas as needed, it would be most cost effective to consolidate areas, where possible, and optimize flights, to reduce the unit costs.

## Flood Insurance Risk Zones

The response from communities in Carroll County, New Hampshire was mixed regarding the accuracy of the flood insurance risk zones as shown on the existing panels. The most common comment by community representatives was that a better base map is needed to allow easier determination of where the risk zone boundaries are relative to the existing features such as roads and buildings.

## **Section 4. Hydrologic and Hydraulic Restudy Needs and Prioritization**

This section summarizes the mapping needs prioritization process and presents the prioritization results based on community input as well as data obtained from other sources including MNUSS and LOMCs.

### **Mapping Needs**

Based on community input, mapping needs included comments that no new studies were needed, flood plain boundaries are delineated incorrectly, the existing detailed study area needs to be extended, and remapping is needed.

### **Prioritization Process**

DFIRM data are available for Carroll County; however, the DFIRM data received on October 15, 2005, and entered into WISE, has not been Quality Assurance/Quality Control checked.

The data collected from the state and community meetings and MNUSS was entered into the WISE scoping tool. The data then were exported out of WISE and put into a spreadsheet to score each stream segment based on the relative importance of the following factors:

- Community population density.
- Population change (growth).
- Age of effective flood insurance study.
- Significant areas (as defined by the community).
- Existing or proposed development since the FIS.
- Presence of LOMAs/LOMRs.
- Priority (as assigned by community).
- Ranking of importance within the community (community defined).

The prioritization of the flooding sources was based on a number of factors specific to Carroll County and is shown in table 8.

**Table 8.** Community flooding source prioritization.

[FIS, Flood Insurance Study; LOMCs, Letters of Map Changes]

<b>Community population density (population per square mile)</b>		<b>1990–2000 percent population growth</b>		<b>Year since most recent FIS</b>	
<b>Range</b>	<b>Value</b>	<b>Range</b>	<b>Value</b>	<b>Range</b>	<b>Value</b>
> 1,000	10	> 50	10	< 1980	10
90–999	8	40–49	8	1980–1984	8
80–89	6	30–39	6	1985–1989	6
60–79	4	20–29	4	1990–1994	4
30–59	2	10–19	2	1995–1999	2
10–29	1	5–9	1	2000–2004	1
< 9	0	< 4	0	2005	0

<b>Significant areas (as defined by the community)</b>		<b>Existing or proposed development since FIS</b>		<b>Presence of LOMCs</b>	
<b>Range</b>	<b>Value</b>	<b>Range</b>	<b>Value</b>	<b>Range</b>	<b>Value</b>
Yes	5	Yes	5	Yes	5
No	0	No	0	No	0

<b>Community priority</b>		<b>Community ranking</b>	
<b>Range</b>	<b>Value</b>	<b>Range</b>	<b>Value</b>
High	20	1	10
Medium	10	2	8
Low	0	3	6
		> 4	4

### Prioritization Results

The sum of the score for the parameters listed in table 8 was used to determine the final score for each stream and flooding source. The list of prioritized flooding sources is provided in appendix D.

### Non-Participating Communities

The Towns of Chatham, Eaton, and Effingham are not currently in the NFIP, however, these communities were contacted. Representatives of Eaton, N.H., stated that their town has two flooding sources of concern.

## Section 5. Recommendations and Schedule

This section presents flood-mapping recommendations to meet the mapping needs described in previous sections.

### Mapping Recommendations

FEMA's goal is to develop updated DFIRMs and FISs for Carroll County, New Hampshire. The County has an area of approximately 934 mi<sup>2</sup> of which approximately 59 mi<sup>2</sup> is water. Carroll County encompasses 18 cities and towns.

### Mapping Options

Mapping can be categorized based on the level of detail and required study effort to create or update flood-hazard zones.

- **Baseline–DFIRM only:** The most economical method of creating a countywide DFIRM is through digitizing flood-hazard information from the effective FIRMs and FISs onto new mapping. This baseline option is currently being undertaken by NH GRANIT.
- **Redelineation:** Detailed topography (2-ft contour interval) is not currently available. The flood-hazard information from the effective FIRMs and FISs can be redelineated onto new topography and base mapping as it becomes available.
- **Limited Detailed Study:** Automated tools are used to produce digital information. This assumes new field surveys for structures but, no new field surveys for cross-sections are needed and that the existing hydraulic model can be used.
- **Detailed Study:** Can be performed to develop the digital information, including field surveyed cross-sections and structures. Since this is the most expensive type of study that FEMA can perform, the extent of the detailed study may be limited.

### Project Alternatives

Costs can be reduced by cutting back on the level of effort for the H&H analyses and(or) reducing the number of DFIRM panels. Alternative H&H options that would help FEMA to reduce costs include reducing the study scope from a detailed study to a limited detail study or redelineation of current flood information only. Reducing the number of DFIRM panels by altering the mix of panel scales would lower the total panel count and reduce the estimated DFIRM production cost.

### Schedule

The project schedule will vary depending on the final scope of the work. Detailed and Limited Detail Restudy and DFIRM production can be completed in 24 months, plus the time required for post preliminary processing, which may be completed in about 6 months for a total of 30 months.

## **Selected References**

- Camp, Dresser, and McKee, Inc., 2004, Flood insurance study needs in the Blackstone River basin in Providence County, Rhode Island and Worcester County, Massachusetts: Contract No. EME-2003-CO-0340, Task Order T001, Task 1, February 2004, variously paged.
- Camp, Dresser, and McKee, Inc., 2005, Flood insurance study needs in Rutland County, Vermont: Contract No. EME-2003-CO-0340, variously paged.
- Federal Emergency Management Agency, 2004, Guidelines and specifications for flood-hazard mapping partners, accessed online January 10, 2006, at [http://www.fema.gov/plan/prevent/fhm/gs\\_main.shtm](http://www.fema.gov/plan/prevent/fhm/gs_main.shtm)
- New Hampshire GRANIT (Geographically Referenced ANalysis and Information Transfer system), 2006, accessed online January 12, 2006, at <http://www.granit.sr.unh.edu/>
- University of New Hampshire, 2006, Carsey Institute, accessed online June 29, 2006, at <http://www.nneindicators.unh.edu/ShowOneRegion.asp?IndicatorID=1&FIPS=33013>.
- Watershed Concepts, a Division of Hayes, Seay, Mattern and Mattern, Watershed Information System (WISE), version 2.0.9, 2005.

**Appendix A. Summary of Letters of Map Change (LOMC)  
Data in Carroll County**



**Table A-1. Summary of Letters of Map Change (LOMC) Data in Carroll County.**

[LOMC, Letters of Map Changes; SFHA, Special Flood Hazard Area. The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood). LOMA, Letter of Map Amendment; LOMR-FW, Letter of Map Revision Floodway; LOMA-OAS, Letter of Map Amendment Out-As-Shown; --, no data]

Community	LOMC type	Case number	Effective date	Flooding source	Address	Property latitude	Property longitude	Removed from SFHA (1)	New flood zone	Notes
Bartlett, N.H.	LOMR-FW	02-01-0606A	5/8/2002	Saco River	Cobb Farm Road	43.081	-71.312	Structure	B	Inadvertent inclusion in floodway 1.
Bartlett, N.H.	LOMA	00-01-0980A	9/29/2000	Ellis River	14 River Bend	44.135	-71.185	Residential structure	C	Portions remain in the SFHA.
Bartlett, N.H.	LOMA-OAS	01-01-0492A	3/7/2001	Rocky Branch	--	44.013	-71.202	Units 1,2, and 3 are outside of the SFHA	C	Portions remain in the floodway.
Bartlett, N.H.	LOMA-DEN	01-01-0658A	6/8/2001	Saco River	Routes 302 and 16	44.095	-71.203	Gift shop	A7	Source of Base Flood Elevation.
Bartlett, N.H.	LOMA	01-01-1144A	7/17/2001	Ellis River	--	44.136	-71.188	Structure	C	Portions remain in the SFHA.
Bartlett, N.H.	LOMA-OAS	03-01-0218A	11/20/2002	Saco River	--	44.083	-71.235	Building VII is outside of the SFHA	C	Portions remain in the SFHA.
Bartlett, N.H.	LOMA	03-01-1430A	7/3/2003	Saco River	Route 16	44.085	-71.149	Residential structure	C	Portions remain in the SFHA.
Bartlett, N.H.	LOMA-OAS	03-01-1908A	12/22/2003	Ellis River	Route 16	44.119	-71.186	Residential structure	X	Portions remain in the floodway.
Bartlett, N.H.	LOMA	04-01-0318A	12/15/2003	Saco River	West Side Road	44.095	-71.201	Residential structure	C	Portions remain in the floodway.
Conway, N.H.	LOMA	05-01-0403A	4/1/2005	Saco River	26 Mallar Lane	44.075	-71.143	Structure	X	Portions remain in the SFHA.
Conway, N.H.	LOMR-FW	05-01-0647A	10/6/2005	Saco River, Foster Brook	3316 White Mountain Highway	44.067	-71.143	Portion of property	X	Legal property description. Inadvertent inclusion in floodway 1.
Conway, N.H.	LOMA	02-01-1424A	9/25/2002	Saco River	--	44.061	-71.141	Structure	X	Portions remain in the floodway.
Conway, N.H.	LOMA-DEN	03-01-0092A	12/4/2002	Saco River	1357 West Side Road	44.014	-71.131	Structure	AE	--
Conway, N.H.	LOMA	04-01-0316A	12/22/2003	Saco River	210 Echo Acres Road	44.031	-71.128	Residential structure	X	Portions remain in the SFHA.
Conway, N.H.	LOMR-FW	03-01-1988A	10/30/2003	Saco River	237 Robin Wood Road	44.002	-71.065	Residential structure	X	Inadvertent inclusion in floodway 1.
Conway, N.H.	LOMR-FW	04-01-1064A	4/29/2004	Kearsarge Brook	85 Cranmore Road	44.054	-71.115	Residential structure	X	Inadvertent inclusion in floodway 1.
Conway, N.H.	LOMA	05-01-0336A	6/16/2005	Saco River	20 B Street	44.049	-71.121	Structure	X	Portions remain in the floodway.
Conway, N.H.	LOMA	04-01-0700A	4/29/2004	Pequawket Pond	422 Pequawket Drive	43.969	-71.131	Portion of property	X	Legal property description. Inadvertent inclusion in the SFHA.
Conway, N.H.	LOMA	03-01-0214A	12/6/2002	Saco River	230 Odell Hill Road	43.986	-71.091	Structure	X	Portions remain in the SFHA.
Conway, N.H.	LOMA	03-01-0288A	12/6/2002	Saco River	82 Washington Street	43.981	-71.118	Structure	X	Portions remain in the SFHA.
Conway, N.H.	LOMA	03-01-0344A	12/26/2002	Saco River	92 Washington Street	43.981	-71.118	Structure	X	Portions remain in the SFHA.
Conway, N.H.	LOMA	03-01-0578A	2/3/2003	Swift River and Saco River	148 Washington Street	43.983	-71.118	Unit 1	X	Portions remain in the SFHA.

**Table A-1. Summary of Letters of Map Change (LOMC) Data in Carroll County.—Continued**

[LOMC, Letters of Map Changes; SFHA, Special Flood Hazard Area. The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood). LOMA, Letter of Map Amendment; LOMR-FW, Letter of Map Revision Floodway; LOMA-OAS, Letter of Map Amendment Out-As-Shown; --, no data]

Community	LOMC type	Case number	Effective date	Flooding source	Address	Property latitude	Property longitude	Removed from SFHA (1)	New flood zone	Notes
Conway, N.H.	LOMR-FW	03-01-0978A	5/1/2003	Saco River	27 East Side Road	43.983	-71.117	Structure	X	Inadvertent inclusion in floodway 1.
Conway, N.H.	LOMA	03-01-1182A	6/2/2003	Saco River	Tax Map 265, Lot 123	43.985	-71.114	Portion of property	X	Legal property description. Portions remain in the floodway.
Conway, N.H.	LOMA	03-01-1912A	9/11/2003	Saco River	100 East Side Road	43.984	-71.116	Barn structure	X	Portions remain in the floodway.
Conway, N.H.	LOMA	03-01-1934A	9/18/2003	Saco River	18 Bryant Drive	43.989	-71.089	Residential structure	X	Portions remain in the floodway.
Conway, N.H.	LOMR-FW	04-01-0262A	2/2/2004	Saco River	66 East Side Road	43.983	-71.115	Residential structure	X	Inadvertent inclusion in floodway 1.
Conway, N.H.	LOMA-OAS	04-01-0672A	2/26/2004	Swift River and Saco River	384 West Side Road	43.988	-71.124	Property	X	--
Effingham, N.H.	LOMA	00-01-0660A	6/30/2000	Province Lake	224 Bonnyman Road	43.679	-71.989	Structure	C	Portions remain in the SFHA. Zone A. Non-participating community.
Freedom, N.H.	LOMA	03-01-0752A	3/24/2003	Ossipee River	Route 153	43.798	-71.059	Portion of property	X	Legal property description. Portions remain in the SFHA. Zone A.
Freedom, N.H.	LOMA	03-01-1456A	8/4/2003	Ossipee River	88 Freedom Point Road	43.799	-70.037	Residential structure	X	Portions remain in the SFHA. Zone A.
Freedom, N.H.	LOMA	04-01-1364A	8/5/2004	Ossipee River	84 Freedom Point Road	43.8	-71.043	Structure	X	Portions remain in the SFHA. Zone A.
Freedom, N.H.	LOMA-F-DEN	05-01-0884A	9/8/2005	Ossipee Lake	437 Pequawket Trail	43.79	-71.109	Structure (residence)	AE	--
Jackson, N.H.	LOMA-OAS	99-01-1078A	8/19/1999	Wildcat River	State Route 16B	44.14856	-71.18279	Structure	C	--
Jackson, N.H.	LOMA	03-01-0618A	2/24/2003	Ellis River	Route 16	44.146	-71.191	Ellis River House	C	Portions remain in the floodway.
Jackson, N.H.	LOMA	04-01-0742A	3/8/2004	Ellis River	153 Route 16	44.145	-71.189	Structure	C	Portions remain in the floodway.
Moultonborough, N.H.	LOMA	02-01-0620A	7/31/2002	Halfway Brook	Whitehouse Farm Lane	43.751	-71.384	Portion of property	C	Legal property description. Portions remain in the SFHA. Zone A.
Moultonborough, N.H.	LOMA	03-01-0818A	4/17/2003	Halfway Brook	Whitehouse Farm Lane	43.754	-71.373	Portion of property	C	Legal property description. Portions remain in the SFHA. Zone A.
Moultonborough, N.H.	LOMA	02-01-0334A	1/11/2002	Lake Winnepesaukee	44 Knoll Point Road	43.711	-71.445	Garage	C	Portions remain in the SFHA. Zone A.
Ossipee, N.H.	LOMA	01-01-0486A	3/28/2001	Bearcamp River	NH Routes 16/25	43.792	-71.176	Restaurant, residential structure, two garages, manufactured home, store, storage building, commercial structure.	X	Portions remain in the floodway. Portions remain in the SFHA.
Ossipee, N.H.	LOMA	03-01-1014A	4/28/2003	Bearcamp River	1915 Route 16	43.792	-71.178	Residential structure	X	Portions remain in the SFHA.
Ossipee, N.H.	LOMA	03-01-1604A	10/30/2003	Dan Hole River	10 Paddy Acre Road	43.753	-71.169	Portion of property	X	Legal property description. Portions remain in the SFHA. Zone A.

**Table A-1. Summary of Letters of Map Change (LOMC) Data in Carroll County.—Continued**

[LOMC, Letters of Map Changes; SFHA, Special Flood Hazard Area. The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood). LOMA, Letter of Map Amendment; LOMR-FW, Letter of Map Revision Floodway; LOMA-OAS, Letter of Map Amendment Out-As-Shown; --, no data]

Community	LOMC type	Case number	Effective date	Flooding source	Address	Property latitude	Property longitude	Removed from SFHA (1)	New flood zone	Notes
Ossipee, N.H.	LOMR-F-DEN	00-01-1138A	12/12/2000	Ossipee Lake	2 Weetamoe Road	43.775	-71.153	Residential structure	AE	Source of Base Flood Elevation.
Ossipee, N.H.	LOMA	04-01-1518A	10/28/2004	Ossipee Lake	32 Ossipee Lake Drive	43.773	-71.153	Residential structure	X	Portions remain in the SFHA.
Ossipee, N.H.	LOMA	03-01-0212A	11/15/2002	Broad Bay	107 Pequawket Trail	43.788	-71.108	Structure	X	Portions remain in the SFHA.
Ossipee, N.H.	LOMA	04-01-0926A	4/5/2004	Broad Bay	8 Cassie Cove Road	43.786	-71.107	Residential structure	X	Portions remain in the SFHA.
Ossipee, N.H.	LOMA	05-01-0435A	5/26/2005	Pine River	540 Route 16	43.682	-71.085	Portion of property	A	Portions remain in the SFHA. Zone A.
Tamworth, N.H.	LOMA	03-01-1896A	9/18/2003	Chocorua River	1853 Chocorua Mountain Highway	43.922	-71.226	Residential structure	X	Portions remain in the SFHA. Zone A.
Tamworth, N.H.	LOMA	02-01-1750A	3/20/2002	Cocorua River	97 Chocorua Mountain Highway	43.881	-71.224	Structure	X	Portions remain in the SFHA. Zone A.
Tamworth, N.H.	LOMA	04-01-0016A	11/6/2003	Swift River	38 Main Street	43.861	-71.264	Residential structure	X	Portions remain in the SFHA. Zone A.
Tamworth, N.H.	LOMA	05-01-0034A	11/23/2004	Moores Pond	36 Bay Circle	43.856	-71.202	Structure	X	Portions remain in the SFHA.
Tuftonboro, N.H.	LOMA-OAS	99-01-524A	3/19/1999	Twenty Mile Bay	314 Governor Wentworth Highway (Route 109)	43.665	-71.287	Structure	X	Portions remain in the SFHA.
Tuftonboro, N.H.	LOMA-OAS	03-01-0404A	1/21/2003	Twenty Mile Brook	180 Middle Road	43.659	-71.252	Property	X	--
Wakefield, N.H.	LOMA	00-01-0816A	10/17/2000	Woodman Lake	3095 Province Lake Road	43.635	-71.983	Structure	X	Portions remain in the SFHA. Zone A.
Wakefield, N.H.	LOMA	00-01-1016A	9/12/2000	Belleau Lake	Beverly Hills Drive	43.65	-71.997	Structure	X	Portions remain in the SFHA.
Wakefield, N.H.	LOMA	00-01-1034A	9/21/2000	Belleau Lake	80 North Dorr Way	43.659	-70.993	Structure	X	Portions remain in the SFHA. Zone A.
Wakefield, N.H.	LOMA	01-01-0070A	11/14/2000	Woodman Lake	Mill Pond Road	43.634	-70.981	Structure	X	Portions remain in the SFHA. Zone A.
Wakefield, N.H.	LOMA	01-01-1094A	8/17/2001	Belleau Lake	146 Gold Coast Drive	43.653	-70.997	Residential structure	X	Portions remain in the SFHA.
Wakefield, N.H.	LOMA	01-01-1244A	8/17/2001	Belleau Lake	137 Lexington Drive	43.647	-70.992	Residential structure	X	Portions remain in the SFHA.
Wakefield, N.H.	LOMA	02-01-0290A	12/14/2001	Belleau Lake	North Desmond Drive	43.661	-71.001	Residential structure	X	Portions remain in the SFHA.
Wakefield, N.H.	LOMA	02-01-0296A	1/4/2002	Belleau Lake	35 Moose Point Road	43.658	-71.001	Residential structure	X	Portions remain in the SFHA.
Wakefield, N.H.	LOMA	02-01-0430A	2/22/2002	Sandy Pond	Sandy Pond North	43.632	-70.985	Structure	X	Portions remain in the SFHA. Zone A.
Wakefield, N.H.	LOMA	02-01-0432A	1/11/2002	Dorr Pond	214 Fisher Road	43.645	-70.991	Structure	X	Portions remain in the SFHA.
Wakefield, N.H.	LOMA	02-01-0466A	1/11/2002	Belleau Lake	521 Beverly Hills Drive	43.651	-70.994	Structure	X	Portions remain in the SFHA.
Wakefield, N.H.	LOMA	02-01-0494A	1/18/2002	Belleau Lake	549 Beverly Hills Drive	43.649	-70.994	Structure	X	Portions remain in the SFHA.
Wakefield, N.H.	LOMA	02-01-0510A	1/25/2002	Dorr Pond	150 Fisher Road	43.644	-70.991	Structure	X	Portions remain in the SFHA.
Wakefield, N.H.	LOMA	02-01-0512A	4/3/2002	Dorr Pond	423 Belleau Blvd.	43.648	-70.991	Structure	X	Portions remain in the SFHA.

**Table A-1. Summary of Letters of Map Change (LOMC) Data in Carroll County.—Continued**

[LOMC, Letters of Map Changes; SFHA, Special Flood Hazard Area. The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood). LOMA, Letter of Map Amendment; LOMR-FW, Letter of Map Revision Floodway; LOMA-OAS, Letter of Map Amendment Out-As-Shown; --, no data]

Community	LOMC type	Case number	Effective date	Flooding source	Address	Property latitude	Property longitude	Removed from SFHA (1)	New flood zone	Notes
Wakefield, N.H.	LOMA	02-01-0526A	2/22/2002	Dorr Pond	536 Beverly Hills Drive	43.649	-70.995	Structure	X	Portions remain in the SFHA.
Wakefield, N.H.	LOMA	02-01-0532A	1/25/2002	Belleau Lake	120 North Dorr Way	43.662	-70.996	Residential structure	X	Portions remain in the SFHA. Zone A.
Wakefield, N.H.	LOMA	02-01-0536A	1/25/2002	Belleau Lake	32 Narrows Point Road	43.646	-70.991	Residential structure	X	Portions remain in the SFHA.
Wakefield, N.H.	LOMA	02-01-0634A	2/13/2002	Belleau Lake	554 Beverly Hills Drive	43.649	-70.995	Structure	X	Portions remain in the SFHA.
Wakefield, N.H.	LOMA	99-01-1142A	4/12/2000	Belleau Lake	25 Pennsylvania Avenue	43.662	-70.996	Residential structure	X	Portions remain in the SFHA. Zone A.
Wakefield, N.H.	LOMA	03-01-0794A	3/17/2003	Belleau Lake	252 Gold Coast Drive	43.655	-71.001	Residential structure	X	Portions remain in the SFHA.
Wakefield, N.H.	LOMA	04-01-1348A	8/5/2004	Belleau Lake	247 Belleau Blvd.	43.644	-70.986	Property	X	Zone A.
Wakefield, N.H.	LOMA	04-01-1654A	10/14/2004	Stump (Balch) Pond	92 Balch Hill Road	43.629	-70.981	Structure	X	Portions remain in the SFHA.
Wakefield, N.H.	LOMA	05-01-0068A	3/4/2005	Tributary to Belleau Lake	41 Don Whittum Drive	43.654	-71.004	Structure	X	Portions remain in the SFHA. Zone A.
Wakefield, N.H.	LOMA	05-01-0406A	3/11/2005	Sandy Pond	8 Eliot Drive	43.63	-70.983	Structure	X	--
Wakefield, N.H.	LOMA	99-01-672A	4/21/1999	Stump (Balch) Pond	6 Hemlock Drive	43.6186	-70.9858	Residential structure	X	Portions remain in the SFHA.
Wakefield, N.H.	LOMA	04-01-1620A	10/12/2004	Stump (Balch) Pond	350 Concord Lane	43.621	-70.982	Structure	X	Portions remain in the SFHA.
Wolfeboro, N.H.	LOMA-DEN	00-01-0136A	1/5/2000	Front Bay/Lake Winnepesaukee	36 Center Street	43.5873	-71.2070	Structure	A	Source of Base Flood Elevation.
Wolfeboro, N.H.	LOMA	00-01-1082A	9/21/2000	Lake Winnepesaukee	--	43.561	-71.209	Residential structure	X	Portions remain in the SFHA.
Wolfeboro, N.H.	LOMA	99-01-1066A	8/18/1999	Lake Winnepesaukee	20 Melody Island	43.561	-71.209	Residential structure	X	Portions remain in the SFHA.
Wolfeboro, N.H.	LOMR-F	03-01-0230A	12/11/2002	Front Bay/Lake Winnepesaukee	36 Center Street	43.586	-71.206	Commercial structure	X	Portions remain in the SFHA. Zone A.
Wolfeboro, N.H.	LOMA	05-01-0316A	3/11/2005	Front Bay	10 King Street	43.589	-71.215	Residential structure	X	--
Wolfeboro, N.H.	LOMA	05-01-0547A	6/30/2005	Lake Wentworth	149 Warren Sands Road	43.579	-71.127	Structure	X	Portions remain in the SFHA.

# **Appendix B. Mapping Needs Update Support System (MNUSS) Needs Assessment Reports**

## **Carroll County, New Hampshire MNUSS Needs Assessment Reports Summary Table**

### **New Hampshire Mapping Needs in MNUSS**

November 30, 2005

**Table B-1.** Mapping Needs Update Support System (MNUSS) needs assessment reports summary.

<b>CID</b>	<b>Community name</b>	<b>Flood data update</b>	<b>Map maintenance</b>	<b>Pending</b>	<b>Resolved</b>
330174	Albany	1	0	0	0
330010	Bartlett	0	0	0	0
330179	Brookfield	0	0	0	0
330181	Chatham	0	0	0	1
330011	Conway	0	0	0	0
330204	Eaton	0	0	0	0
330012	Effingham	0	0	0	0
330013	Freedom	0	0	0	0
330213	Hart's Location	2	0	0	0
330014	Jackson	0	0	0	0
330220	Madison	0	0	0	0
330015	Moultonborough	0	0	0	0
330016	Ossipee	0	1	0	0
330017	Sandwich	0	0	0	0
330018	Tamworth	0	0	0	0
330234	Tuftonboro	0	0	0	0
330019	Wakefield	11	1	0	0
330239	Wolfeboro	8	1	0	0
	Totals	22	3	0	0

## **Appendix C. State and Community Meetings**

**GENERAL COMMUNITY INFORMATION**

Community: ALBANY, TOWN OF CID: 330174  
County: CARROLL COUNTY State: New Hampshire

**NEED DETAIL INFORMATION**

Need ID: 10000000010568 Entered By: Chuck Wood  
Source: FEMA Future File Date: 06/08/1999  
Approved By: FEMA  
Date: 6/8/1999

Study Category: RIVERINE Need Types: Changes to hydraulic analysis  
Flooding Source: SWIFT RIVER

Status: Existing

**NEED FLOODPLAIN DATA**

Anticipated BFE Change: Increased By Greater Than 5 feet  
Length of Study: 1.3 miles  
Average Width of Floodplain: 2500 feet  
Location of Floodplain:

**PANELS AFFECTED BY THE NEED**

No panels have been associated with this need.

**ORIGIN OF NEED INFORMATION**

Entity: D&D FUTURE FILE Phone: 3333333334444 Ext: *Unspecified*  
Last Name: *Unspecified* First Name: *Unspecified*  
Address 1: *Unspecified* Title: *Unspecified*  
Address 2: *Unspecified* Email: *Unspecified*  
City: *Unspecified* Fax: 8888888889999  
State: *Unspecified* Zip: *Unspecified*

**NEED NOTES AND COMMENTS**

Date	Entered By	Note
06/08/1999	Chuck Wood	11x17 EFFECTIVE IS 'GROSSLY' INACCURATE, REQUIRES RESTUDY OF SWIFT RIVER. NOTE: THIS STUDY WILL BE FORMATTED TO A Z-FOLD.
06/08/1999	Chuck Wood	11x17 EFFECTIVE IS 'GROSSLY' INACCURATE, REQUIRES RESTUDY OF SWIFT RIVER. NOTE: THIS STUDY WILL BE FORMATTED TO A Z-FOLD.



### GENERAL COMMUNITY INFORMATION

Community: HART'S LOCATION, TOWN OF CID: 330213  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029865 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/05/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

---

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Flooding Source: Saco River

---

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Increased By Between 1 and 5 feet  
Length of Study: 1 miles  
Average Width of Floodplain: 500 feet  
Location of Floodplain: from confluence of Bemis Brook to confluence of Nancy Brook

### PANELS AFFECTED BY THE NEED

No panels have been associated with this need.

### ORIGIN OF NEED INFORMATION

Entity: HART'S LOCATION Phone: (603) 374-1999 Ext: -  
Last Name: KING First Name: BILL  
Address 1: TOWN OF HART'S LOCATION Title: FORMER SELECTMAN  
Address 2: P.O. BOX 512 Email: -  
City: HART'S LOCATION Fax: (603) 374-6168  
State: NH Zip: 03810

### NEED NOTES AND COMMENTS

Date	Entered By	Note
12/05/2002	Kara Deutsch	Saco River flooded and closed Notch Road for 3-4 weeks in 1997. Community has requested FIRMs numerous times.

### GENERAL COMMUNITY INFORMATION

Community: HART'S LOCATION, TOWN OF CID: 330213  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029866 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/05/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

---

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Flooding Source: SAWYER RIVER

---

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Increased By Between 1 and 5 feet  
Length of Study: 0.25 miles  
Average Width of Floodplain: 500 feet  
Location of Floodplain: from Barlett town line 0.25 miles into Hart's Location.

### PANELS AFFECTED BY THE NEED

No panels have been associated with this need.

### ORIGIN OF NEED INFORMATION

Entity: HART'S LOCATION Phone: (603) 374-1999 Ext: -  
Last Name: KING First Name: BILL  
Address 1: TOWN OF HART'S LOCATION Title: FORMER SELECTMAN  
Address 2: P.O. BOX 512 Email: -  
City: HART'S LOCATION Fax: (603) 374-6168  
State: NH Zip: 03810

### NEED NOTES AND COMMENTS

Date	Entered By	Note
12/05/2002	Kara Deutsch	Majority of town's houses are near Sawyer River, which neighbors the Town of Bartlett. Area is prone to flooding. Town of Hart's Location requests to be mapped.

**GENERAL COMMUNITY INFORMATION**

Community: OSSIPPEE, TOWN OF CID: 330016  
County: CARROLL COUNTY State: New Hampshire

**NEED DETAIL INFORMATION**

Need ID: 10000000029721 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/03/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

Study Category: MAINTENANCE Need Types: Add streets to panel

Status: Existing

**PANELS AFFECTED BY THE NEED**

3300160005B (06/17/1991) 3300160006B (06/17/1991)  
3300160030B (06/17/1991)

**ORIGIN OF NEED INFORMATION**

Entity: TOWN OF OSSIPPEE Phone: (603) 539-4181 Ext: *Unspecified*  
Last Name: O'DONNELL First Name: BUD  
Address 1: *Unspecified* Title: ZONING ENFORCEMENT OFFICER  
Address 2: *Unspecified* Email: *Unspecified*  
City: *Unspecified* Fax: *Unspecified*  
State: *Unspecified* Zip: *Unspecified*

**NEED NOTES AND COMMENTS**

There are no notes for this need.

**GENERAL COMMUNITY INFORMATION**

Community: WAKEFIELD, TOWN OF CID: 330019  
County: CARROLL COUNTY State: New Hampshire

**NEED DETAIL INFORMATION**

Need ID: 10000000029815 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/04/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

---

Study Category: MAINTENANCE Need Types: Add streets to panel  
Add an ERM

---

Status: Existing

**PANELS AFFECTED BY THE NEED**

3300190005A (06/17/1991) 3300190010A (06/17/1991)  
3300190015A (06/17/1991)

**ORIGIN OF NEED INFORMATION**

Entity: WAKEFIELD CODE ENFORCEMENT DEPARTMENT Phone: (603) 522-6205 Ext: 308  
Last Name: PAUL First Name: KEN  
Address 1: TOWN OF WAKEFIELD Title: CODE ENFORCEMENT OFFICER  
Address 2: 2 HIGH STREET Email: -  
City: WAKEFIELD Fax: (603) 522-6794  
State: NH Zip: 03872

**NEED NOTES AND COMMENTS**

Date	Entered By	Note
12/04/2002	Kara Deutsch	E911 roads data is available. Town has GIS.

### GENERAL COMMUNITY INFORMATION

Community: WAKEFIELD, TOWN OF CID: 330019  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 100000000029817 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/04/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

---

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Flooding Source: SANDY POND AND TRIBS

---

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Decreased By Less Than 1 foot  
Length of Study: 1.7 miles  
Average Width of Floodplain: 600 feet  
Location of Floodplain: outlet of Sandy Pond to tributary headwaters

### PANELS AFFECTED BY THE NEED

3300190005A (06/17/1991)

### ORIGIN OF NEED INFORMATION

Entity: WAKEFIELD CODE ENFORCEMENT DEPARTMENT Phone: (603) 522-6205 Ext: 308  
Last Name: PAUL First Name: KEN  
Address 1: TOWN OF WAKEFIELD Title: CODE ENFORCEMENT OFFICER  
Address 2: 2 HIGH STREET Email: -  
City: WAKEFIELD Fax: (603) 522-6794  
State: NH Zip: 03872

### NEED NOTES AND COMMENTS

Date	Entered By	Note
12/04/2002	Kara Deutsch	Currently Zone A.

### GENERAL COMMUNITY INFORMATION

Community: WAKEFIELD, TOWN OF CID: 330019  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029819 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/04/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

---

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Flooding Source: WOODMAN LAKE

---

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Decreased By Less Than 1 foot  
Length of Study: 0.6 miles  
Average Width of Floodplain: 700 feet  
Location of Floodplain: inlet to outlet

### PANELS AFFECTED BY THE NEED

3300190005A (06/17/1991)

### ORIGIN OF NEED INFORMATION

Entity: WAKEFIELD CODE ENFORCEMENT DEPARTMENT Phone: (603) 522-6205 Ext: 308  
Last Name: PAUL First Name: KEN  
Address 1: TOWN OF WAKEFIELD Title: CODE ENFORCEMENT OFFICER  
Address 2: 2 HIGH STREET Email: -  
City: WAKEFIELD Fax: (603) 522-6794  
State: NH Zip: 03872

### NEED NOTES AND COMMENTS

Date	Entered By	Note
12/04/2002	Kara Deutsch	New dam configuration on Belleau Lake affects Woodman Lake (currently Zone A).

### GENERAL COMMUNITY INFORMATION

Community: WAKEFIELD, TOWN OF CID: 330019  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 100000000029822 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/04/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

---

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Flooding Source: PINE RIVER POND TRIBUTARY

---

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Decreased By Less Than 1 foot  
Length of Study: 1.5 miles  
Average Width of Floodplain: 800 feet  
Location of Floodplain: northern end of Pine River Pond to corporate limit.

### PANELS AFFECTED BY THE NEED

3300190005A (06/17/1991)

### ORIGIN OF NEED INFORMATION

Entity: WAKEFIELD CODE ENFORCEMENT DEPARTMENT Phone: (603) 522-6205 Ext: 308  
Last Name: PAUL First Name: KEN  
Address 1: TOWN OF WAKEFIELD Title: CODE ENFORCEMENT OFFICER  
Address 2: 2 HIGH STREET Email: -  
City: WAKEFIELD Fax: (603) 522-6794  
State: NH Zip: 03872

### NEED NOTES AND COMMENTS

There are no notes for this need.

### GENERAL COMMUNITY INFORMATION

Community: WAKEFIELD, TOWN OF CID: 330019  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029825 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/04/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Flooding Source: BELLEAU LAKE TRIBUTARY

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Decreased By Less Than 1 foot  
Length of Study: 2.3 miles  
Average Width of Floodplain: 800 feet  
Location of Floodplain: from confluence of Belleau Lake to corporate limit.

### PANELS AFFECTED BY THE NEED

3300190005A (06/17/1991)

### ORIGIN OF NEED INFORMATION

Entity: WAKEFIELD CODE ENFORCEMENT DEPARTMENT Phone: (603) 522-6205 Ext: 308  
Last Name: PAUL First Name: KEN  
Address 1: TOWN OF WAKEFIELD Title: CODE ENFORCEMENT OFFICER  
Address 2: 2 HIGH STREET Email: -  
City: WAKEFIELD Fax: (603) 522-6794  
State: NH Zip: 03872

### NEED NOTES AND COMMENTS

There are no notes for this need.



### GENERAL COMMUNITY INFORMATION

Community: WAKEFIELD, TOWN OF CID: 330019  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 100000000029827 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/04/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Flooding Source: TRIBUTARY 2 TO BELLEAU LAKE

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Decreased By Less Than 1 foot  
Length of Study: 1.7 miles  
Average Width of Floodplain: 700 feet  
Location of Floodplain: confluence with Belleau Lake to corporate limit.

### PANELS AFFECTED BY THE NEED

3300190005A (06/17/1991)

### ORIGIN OF NEED INFORMATION

Entity: WAKEFIELD CODE ENFORCEMENT DEPARTMENT Phone: (603) 522-6205 Ext: 308  
Last Name: PAUL First Name: KEN  
Address 1: TOWN OF WAKEFIELD Title: CODE ENFORCEMENT OFFICER  
Address 2: 2 HIGH STREET Email: -  
City: WAKEFIELD Fax: (603) 522-6794  
State: NH Zip: 03872

### NEED NOTES AND COMMENTS

Date	Entered By	Note
12/04/2002	Kara Deutsch	Trib 2 crosses Leightons Corner Rd. and Pick Pocket Rd.

### GENERAL COMMUNITY INFORMATION

Community: WAKEFIELD, TOWN OF CID: 330019  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029829 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/04/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

---

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Flooding Source: SCRIBNER BROOK

---

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Decreased By Less Than 1 foot  
Length of Study: 2.3 miles  
Average Width of Floodplain: 600 feet  
Location of Floodplain: Rt. 16 to confluence with Great East Lake.

### PANELS AFFECTED BY THE NEED

3300190010A (06/17/1991)

### ORIGIN OF NEED INFORMATION

Entity: WAKEFIELD CODE ENFORCEMENT DEPARTMENT Phone: (603) 522-6205 Ext: 308  
Last Name: PAUL First Name: KEN  
Address 1: TOWN OF WAKEFIELD Title: CODE ENFORCEMENT OFFICER  
Address 2: 2 HIGH STREET Email: -  
City: WAKEFIELD Fax: (603) 522-6794  
State: NH Zip: 03872

### NEED NOTES AND COMMENTS

There are no notes for this need.

### GENERAL COMMUNITY INFORMATION

Community: WAKEFIELD, TOWN OF CID: 330019  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029831 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/04/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

---

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Flooding Source: COPP BROOK

---

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Decreased By Less Than 1 foot  
Length of Study: 3.4 miles  
Average Width of Floodplain: 1800 feet  
Location of Floodplain: Rt. 16 to confluence with Great East Lake.

### PANELS AFFECTED BY THE NEED

3300190010A (06/17/1991)

### ORIGIN OF NEED INFORMATION

Entity: WAKEFIELD CODE ENFORCEMENT DEPARTMENT Phone: (603) 522-6205 Ext: 308  
Last Name: PAUL First Name: KEN  
Address 1: TOWN OF WAKEFIELD Title: CODE ENFORCEMENT OFFICER  
Address 2: 2 HIGH STREET Email: -  
City: WAKEFIELD Fax: (603) 522-6794  
State: NH Zip: 03872

### NEED NOTES AND COMMENTS

There are no notes for this need.

### GENERAL COMMUNITY INFORMATION

Community: WAKEFIELD, TOWN OF CID: 330019  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029832 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/04/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

---

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Flooding Source: HORN BROOK

---

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Decreased By Less Than 1 foot  
Length of Study: 1.5 miles  
Average Width of Floodplain: 700 feet  
Location of Floodplain: from Rt. 16 to Lovell Lake.

### PANELS AFFECTED BY THE NEED

3300190010A (06/17/1991)

### ORIGIN OF NEED INFORMATION

Entity: WAKEFIELD CODE ENFORCEMENT DEPARTMENT Phone: (603) 522-6205 Ext: 308  
Last Name: PAUL First Name: KEN  
Address 1: TOWN OF WAKEFIELD Title: CODE ENFORCEMENT OFFICER  
Address 2: 2 HIGH STREET Email: -  
City: WAKEFIELD Fax: (603) 522-6794  
State: NH Zip: 03872

### NEED NOTES AND COMMENTS

There are no notes for this need.

### GENERAL COMMUNITY INFORMATION

Community: WAKEFIELD, TOWN OF CID: 330019  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029833 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/04/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

---

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Changes to BFEs

Flooding Source: PINE RIVER POND

---

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Decreased By Less Than 1 foot  
Length of Study: 3.3 miles  
Average Width of Floodplain: 2000 feet  
Location of Floodplain: inlet to outlet

### PANELS AFFECTED BY THE NEED

3300190005A (06/17/1991)

### ORIGIN OF NEED INFORMATION

Entity: WAKEFIELD CODE ENFORCEMENT DEPARTMENT Phone: (603) 522-6205 Ext: 308  
Last Name: PAUL First Name: KEN  
Address 1: TOWN OF WAKEFIELD Title: CODE ENFORCEMENT OFFICER  
Address 2: 2 HIGH STREET Email: -  
City: WAKEFIELD Fax: (603) 522-6794  
State: NH Zip: 03872

### NEED NOTES AND COMMENTS

Date	Entered By	Note
12/04/2002	Kara Deutsch	Currently unstudied - community requests BFE.

### GENERAL COMMUNITY INFORMATION

Community: WAKEFIELD, TOWN OF CID: 330019  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029834 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/04/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

---

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Flooding Source: LOVELL LAKE

---

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Increased By Between 1 and 5 feet  
Length of Study: 2.4 miles  
Average Width of Floodplain: 2000 feet  
Location of Floodplain: inlet to outlet

### PANELS AFFECTED BY THE NEED

3300190010A (06/17/1991)

### ORIGIN OF NEED INFORMATION

Entity: WAKEFIELD CODE ENFORCEMENT DEPARTMENT Phone: (603) 522-6205 Ext: 308  
Last Name: PAUL First Name: KEN  
Address 1: TOWN OF WAKEFIELD Title: CODE ENFORCEMENT OFFICER  
Address 2: 2 HIGH STREET Email: -  
City: WAKEFIELD Fax: (603) 522-6794  
State: NH Zip: 03872

### NEED NOTES AND COMMENTS

Date	Entered By	Note
12/04/2002	Kara Deutsch	Currently unstudied - community requests BFE due to development near Lake.

### GENERAL COMMUNITY INFORMATION

Community: WOLFEBORO, TOWN OF CID: 330239  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029856 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/05/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

---

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Changes to floodplain width

Flooding Source: BATSON POND

---

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Decreased By Less Than 1 foot  
Length of Study: 0.18 miles  
Average Width of Floodplain: 1000 feet  
Location of Floodplain:

### PANELS AFFECTED BY THE NEED

3302390005A (05/17/1989)

### ORIGIN OF NEED INFORMATION

Entity: WOLFEBORO PLANNING DEPARTMENT Phone: (603) 569-5970 Ext: -  
Last Name: HOUSEMAN First Name: ROB  
Address 1: TOWN OF WOLFEBORO Title: PLANNER  
Address 2: P.O. BOX 629 Email: wolftwnplnr@metrocast.net  
City: WOLFEBORO Fax: (603) 569-8167  
State: NH Zip: 03894

### NEED NOTES AND COMMENTS

Date	Entered By	Note
12/05/2002	Kara Deutsch	Community requests BFE due to development.

### GENERAL COMMUNITY INFORMATION

Community: WOLFEBORO, TOWN OF CID: 330239  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029857 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/05/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

Study Category: MAINTENANCE Need Types: Add streets to panel

Status: Existing

### PANELS AFFECTED BY THE NEED

3302390005A (05/17/1989) 3302390010A (05/17/1989)  
3302390015A (05/17/1989) 3302390020A (05/17/1989)

### ORIGIN OF NEED INFORMATION

Entity: WOLFEBORO PLANNING DEPARTMENT Phone: (603) 569-5970 Ext: -  
Last Name: HOUSEMAN First Name: ROB  
Address 1: TOWN OF WOLFEBORO Title: PLANNER  
Address 2: P.O. BOX 629 Email: wolftwnplnr@metrocast.net  
City: WOLFEBORO Fax: (603) 569-8167  
State: NH Zip: 03894

### NEED NOTES AND COMMENTS

There are no notes for this need.



### GENERAL COMMUNITY INFORMATION

Community: WOLFEBORO, TOWN OF CID: 330239  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 100000000029858 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/05/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Changes to floodplain width  
Changes to BFEs

Flooding Source: CRESCENT LAKE

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Decreased By Less Than 1 foot  
Length of Study: 1.3 miles  
Average Width of Floodplain: 1000 feet  
Location of Floodplain: Crescent Lake inlet to Lake Wentworth

### PANELS AFFECTED BY THE NEED

3302390015A (05/17/1989)

### ORIGIN OF NEED INFORMATION

Entity: WOLFEBORO PLANNING DEPARTMENT Phone: (603) 569-5970 Ext: -  
Last Name: HOUSEMAN First Name: ROB  
Address 1: TOWN OF WOLFEBORO Title: PLANNER  
Address 2: P.O. BOX 629 Email: wolftwnplnr@metrocast.net  
City: WOLFEBORO Fax: (603) 569-8167  
State: NH Zip: 03894

### NEED NOTES AND COMMENTS

Date	Entered By	Note
12/05/2002	Kara Deutsch	Bridge replaced at Whitlen Neck Road. Dam on Crescent Lake rebuilt, changing spillway feeding Smith River.

### GENERAL COMMUNITY INFORMATION

Community: WOLFEBORO, TOWN OF CID: 330239  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029859 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/05/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

---

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Changes to floodplain width

Flooding Source: FRONT BAY

---

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Increased By Less Than 1 foot  
Length of Study: 0.89 miles  
Average Width of Floodplain: 500 feet  
Location of Floodplain: southern end of Front Bay to northern extent.

### PANELS AFFECTED BY THE NEED

3302390015A (05/17/1989)

### ORIGIN OF NEED INFORMATION

Entity: WOLFEBORO PLANNING DEPARTMENT Phone: (603) 569-5970 Ext: -  
Last Name: HOUSEMAN First Name: ROB  
Address 1: TOWN OF WOLFEBORO Title: PLANNER  
Address 2: P.O. BOX 629 Email: wolftwnplnr@metrocast.net  
City: WOLFEBORO Fax: (603) 569-8167  
State: NH Zip: 03894

### NEED NOTES AND COMMENTS

Date	Entered By	Note
12/05/2002	Kara Deutsch	Development in this area that is currently Zone A.

### GENERAL COMMUNITY INFORMATION

Community: WOLFEBORO, TOWN OF CID: 330239  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029860 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/05/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

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Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Changes to floodplain width

Flooding Source: HARVEY BROOK

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Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Decreased By Between 1 and 5 feet  
Length of Study: 0.57 miles  
Average Width of Floodplain: 600 feet  
Location of Floodplain: from Rt 109A downstream 0.57 miles.

### PANELS AFFECTED BY THE NEED

3302390015A (05/17/1989)

### ORIGIN OF NEED INFORMATION

Entity: WOLFEBORO PLANNING DEPARTMENT Phone: (603) 569-5970 Ext: -  
Last Name: HOUSEMAN First Name: ROB  
Address 1: TOWN OF WOLFEBORO Title: PLANNER  
Address 2: P.O. BOX 629 Email: wolftwnplnr@metrocast.net  
City: WOLFEBORO Fax: (603) 569-8167  
State: NH Zip: 03894

### NEED NOTES AND COMMENTS

Date	Entered By	Note
12/05/2002	Kara Deutsch	Area is Zone A and is developing, however, there is a steep topography where the floodplain may currently be too wide.

### GENERAL COMMUNITY INFORMATION

Community: WOLFEBORO, TOWN OF CID: 330239  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029861 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/05/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

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Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Flooding Source: HEATH BROOK

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Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Decreased By Less Than 1 foot  
Length of Study: 2.2 miles  
Average Width of Floodplain: 500 feet  
Location of Floodplain: town line to Pleasant Valley Road.

### PANELS AFFECTED BY THE NEED

3302390015A (05/17/1989)

### ORIGIN OF NEED INFORMATION

Entity: WOLFEBORO PLANNING DEPARTMENT Phone: (603) 569-5970 Ext: -  
Last Name: HOUSEMAN First Name: ROB  
Address 1: TOWN OF WOLFEBORO Title: PLANNER  
Address 2: P.O. BOX 629 Email: wolftwnplnr@metrocast.net  
City: WOLFEBORO Fax: (603) 569-8167  
State: NH Zip: 03894

### NEED NOTES AND COMMENTS

Date	Entered By	Note
12/05/2002	Kara Deutsch	Development along New Garden Rd. and Heath Brook (currently Zone A).

### GENERAL COMMUNITY INFORMATION

Community: WOLFEBORO, TOWN OF CID: 330239  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029862 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/05/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

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Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Flooding Source: TOWNSEND BROOK

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Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Decreased By Less Than 1 foot  
Length of Study: 1.3 miles  
Average Width of Floodplain: 500 feet  
Location of Floodplain: Warren Sands Road to Lake Wentworth.

### PANELS AFFECTED BY THE NEED

3302390020A (05/17/1989)

### ORIGIN OF NEED INFORMATION

Entity: WOLFEBORO PLANNING DEPARTMENT Phone: (603) 569-5970 Ext: -  
Last Name: HOUSEMAN First Name: ROB  
Address 1: TOWN OF WOLFEBORO Title: PLANNER  
Address 2: P.O. BOX 629 Email: wolftwnplnr@metrocast.net  
City: WOLFEBORO Fax: (603) 569-8167  
State: NH Zip: 03894

### NEED NOTES AND COMMENTS

Date	Entered By	Note
12/05/2002	Kara Deutsch	Development along Warren Sands Road and Townsend Brook (Zone A).

## GENERAL COMMUNITY INFORMATION

Community: WOLFEBORO, TOWN OF CID: 330239  
County: CARROLL COUNTY State: New Hampshire

## NEED DETAIL INFORMATION

Need ID: 10000000029863 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/05/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Flooding Source: WILLEY BROOK

Status: Existing

## NEED FLOODPLAIN DATA

Anticipated  
BFE Decreased By Less Than 1 foot  
Change:  
Length of Study: 4.7 miles  
Average  
Width of 500 feet  
Floodplain:  
Location of beginning 3,000 ft upstream of Pork Hill Road and ending at Lake  
Floodplain: Wentworth.

## PANELS AFFECTED BY THE NEED

3302390005A (05/17/1989)

## ORIGIN OF NEED INFORMATION

Entity: WOLFEBORO PLANNING DEPARTMENT Phone: (603) 569-5970 Ext: -  
Last Name: HOUSEMAN First Name: ROB  
Address 1: TOWN OF WOLFEBORO Title: PLANNER  
Address 2: P.O. BOX 629 Email: wolftwnplnr@metrocast.net  
City: WOLFEBORO Fax: (603) 569-8167  
State: NH Zip: 03894

## NEED NOTES AND COMMENTS

Date	Entered By	Note
12/05/2002	Kara Deutsch	Bridge rebuilt on College Road. Development pressure near Willey Brook, which has pockets designated as Zone A, but mostly appears unstudied. See FIRMette for part of Willey Brook in Related Files for this community.

### GENERAL COMMUNITY INFORMATION

Community: WOLFEBORO, TOWN OF CID: 330239  
County: CARROLL COUNTY State: New Hampshire

### NEED DETAIL INFORMATION

Need ID: 10000000029864 Entered By: Kara Deutsch  
Source: State Implementation Plan Date: 12/05/2002  
Approved By: Automatic (no FEMA validation)  
Date: 2/3/2003

Study Category: RIVERINE Need Types: Changes to hydrologic conditions  
Changes to hydraulic analysis  
Flooding Source: SARGENTS POND

Status: Existing

### NEED FLOODPLAIN DATA

Anticipated BFE Change: Decreased By Less Than 1 foot  
Length of Study: 0.8 miles  
Average Width of Floodplain: 2750 feet  
Location of Floodplain: North Line Road to confluence with Hersey Brook.

### PANELS AFFECTED BY THE NEED

3302390005A (05/17/1989) 3302390020A (05/17/1989)

### ORIGIN OF NEED INFORMATION

Entity: WOLFEBORO PLANNING DEPARTMENT Phone: (603) 569-5970 Ext: -  
Last Name: HOUSEMAN First Name: ROB  
Address 1: TOWN OF WOLFEBORO Title: PLANNER  
Address 2: P.O. BOX 629 Email: wolftwnplnr@metrocast.net  
City: WOLFEBORO Fax: (603) 569-8167  
State: NH Zip: 03894

### NEED NOTES AND COMMENTS

Date	Entered By	Note
12/05/2002	Kara Deutsch	Community requests BFE for Sargents Pond due to development pressure.

# **FEMA Map Modernization Program Carroll County Scoping**

## **Scoping Meeting Conference Call Meeting Minutes**

September 1, 2005

U.S. Geological Survey (USGS) held a kick-off meeting via conference call on September 1, 2005, with representatives from New Hampshire Office of Emergency Management (NHOEM), Federal Emergency Management Agency (FEMA), USGS, and Watershed Concepts (RMC - Regional Management Center) to introduce the scoping project team and review roles and responsibilities.

As one of the scoping study process requirements, this conference call was held to review the USGS role in the scoping project process in four counties in New Hampshire (Carroll, Coos, Belknap, and Carroll Counties) as well as to detail the data requirements of USGS in order to determine restudy needs and prioritization of restudies in these four counties.

### **Attendance:**

- Dean Savramis, FEMA Map Modernization Coordinator
- Brent McCarthy and Jeff Burm, Watershed Concepts (RMC)
- Fay Rubin, GIS Manager at Complex Systems Research Center, University of New Hampshire
- Robert Flynn, Craig Johnston, and Laura Hayes, USGS
- Joanne Cassulo and Jennifer DeLong, Map Modernization Coordinators, NHOEM

### **Minutes:**

1. Dean Savramis (FEMA)—Provided an overview of the Map Modernization Program and Scoping. He also provided a description of the countywide approach.
2. Brent McCarthy (Watershed Concepts)—Describe the role of the RMC in assisting FEMA and the mapping contractors. Description of the WISE computer applications developed for FEMA to standardize the scoping process methodology, data collection, and storage for the map modernization program. Description of the DFIRM Production tool.
3. Joanne Cassulo and Jennifer DeLong (NHOEM)—Spoke about CAVs to collect information. NHOEM is providing copies of LOMAs. Joanne mentioned that the regional planning commissions have a lot of data available and can provide community contacts.



4. Jeff Burm (Watershed Concepts)—mentioned that FEMA’s Community Information System (CIS) has CAVs and CACs and access can be gotten from Mike Goetz at FEMA. He also spoke about the WISE scoping tool and various features of this tool including community contact information, available GIS data, stream data, statistical analysis, stream mile information to calculate costs for hydrology and hydraulics, LOMAs, CAVs and CACs, creation of reports for each of the items.
5. Fay Rubin (GRANIT, UNH Complex Systems)—Fay spoke about the Map Modernization work that is being done at FEMA and that she is using DOQs in her map modernization work. Fay mentioned that the Carroll County digitization is complete, that the Belknap and Carroll County digitization will be complete by December and that the Coos County digitization will be complete next year (due by December of 2006). She stated that NHDOT is in the process of updating DOQs ion southeastern New Hampshire and that they are looking for a vendor to process the data. She mentioned that the 2003 NAIP color DOQs may not meet FEMA specifications. She has the NAIP DOQs in New Hampshire State Plane coordinates (our NAIP DOQs are in UTM projection).
6. Fay Rubin, Craig Johnston, Laura Hayes and Rob Flynn (GRANIT; USGS)—discussed available data and coverages within New Hampshire (for example, 2003 NAIP color DOQs). Remote sensing, base map information, GIS data (for example, contour data, E911 data, DEMs, buildings layer, survey data available from NHDOT). County Regional Planning Commissions may also have data.
7. USGS and NHOEM—Discuss follow-up meetings with communities to discuss prioritization. USGS will need to coordinate with NHOEM and Watershed Concepts to obtain mailing lists for communities and set a date to meet with representatives from each of the towns in each of the counties. Brent McCarthy mentioned that it may be a good idea to set up a morning and evening meeting with each county in order to be able to talk to all of the representatives in each town (two meetings for each county). Brent McCarthy also mentioned that Watershed Concepts could lead breakout sessions with towns during the meetings with the counties.

# Carroll County Interview Form FEMA Map Modernization Program

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Date: \_\_\_\_\_ Effective FIS/FIRM Date: \_\_\_\_\_

Community: \_\_\_\_\_ Form of Government: \_\_\_\_\_

CID#: \_\_\_\_\_ If Town Government,  
Date of Annual Town Meeting: \_\_\_\_\_

**Community Representative:**

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Telephone #: \_\_\_\_\_ Email: \_\_\_\_\_

Fax: \_\_\_\_\_

**Other Appropriate Community Contacts:** \_\_\_\_\_

1. Known problems with current FIRMs and FISs for the community (general details on next pages).
  - a. Base Map Issues (note FIRM panel numbers): (for example, poor/mixed map scales, panels not printed, change in corporate boundaries, etc.)

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- b. Flood plain Issues (note FIRM panel numbers): (for example, need flood elevations, disagree with flood plain boundaries, flood elevations too high/low, comments from MNUSS or best available data)

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2. Areas of approximate study (for example, Zone A's) where detailed re-studies should be considered:
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3. Areas not mapped/no flood plain where approximate or detailed studies should be considered:

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4. Changes to structures within the town that may affect river hydraulics (for example, reconstruction or removal of dams, changes to bridges and culverts, etc.):

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5. Areas of increased/proposed development within the flood plain since the effective FIS:

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1. Availability of mapping at the town level:

a. Aerial Photography (flight date, scale, color/black and white):

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b. Topography (contour interval):

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c. Other:

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2. Future community data acquisition plans/wants/needs:

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3. Information on GIS programs in-place or GIS plans that may benefit from a new FIRM:

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4. Other comments:

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5. Action Items:

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Additional Notes:

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## **Appendix D. Prioritized Flooding Sources**

**Appendix D. Prioritized flooding sources in Carroll County.**

[CID, Community Identification; FIS, Flood Insurance Studies; LOMC, Letter of Map Change]

Community	CID	Reach_ID	Description	Current analysis effective date	Current effective zone	Study reach length (ft)	Study type	Community priority range	Community priority	Population density score	Population growth score	Year since most recent FIS score	Significant area score	Development score	LOMC score	Community priority value	Community ranking value	Total score
Wolfeboro	330239	{26D53DB7-7B3D-411F-9F4B-3F45527CD6A4}	Lake Winnepesaukee (1112496.50, 387477.71)	5/17/1989	AE	14,497.51	Use of effective information	Medium High	1	8	4	6	5	5	5	15	10	58
Wolfeboro	330239	{1B96D7AD-ED9F-42E9-AF09-0FF1DAF7BE04}	Lake Wentworth (1128835.01, 396955.56)	5/17/1989	AE	21,368.82	Use of effective information	Medium High	2	8	4	6	5	5	5	15	8	56
Jackson	330014	{146A6F85-9520-457B-8680-C5CE9AACC9DF}	Ellis River (1108600.35, 600429.12)	7/2/1979	AE	3,580.83	Limited detailed study	Medium High	1	1	4	10	5	5	5	15	10	55
Bartlett	330010	{5F69ECB2-9ED8-4085-B4B6-75B38BC2C8CF}	Saco River (1075341.41, 575333.26)	5/1/1979	AE	65,255.08	Detailed study/Riverine	Medium High	1	2	2	8	5	5	5	15	10	52
Freedom	330013	{5A45E13B-DFC3-45A6-8478-CF6929C53C73}	Ossipee River (1141998.56, 474733.64)	7/3/1995	A	3,461.74	Detailed study/Riverine	Medium High	1	2	8	2	5	5	5	15	10	52
Wolfeboro	330239	{6A547325-F4C1-4C27-87C2-3A458B098889}	Front Bay (1103359.52, 397609.53)	5/17/1989	A	1,571.25	Detailed study/Riverine	Medium High	6	8	4	6	5	5	5	15	4	52
Wolfeboro	330239	{F906D694-49C1-45AB-953A-130BABFCE16}	Front Bay (1104321.50, 395589.66)	5/17/1988	A	3,520.91	Detailed study/Riverine	Medium High	6	8	4	6	5	5	5	15	4	52
Wolfeboro	330239	{3E948E43-7060-4BD9-A0AC-23B995345C2B}	Lake Wentworth (1121878.52, 403907.34)	5/17/1989	A	2,319.11	Redelineation	Medium High	4	8	4	6	5	5	5	15	4	52
Wolfeboro	330239	{8CC55573-469C-440F-B7CE-58B398039906}	Unnamed (1106123.40, 397629.34)	5/17/1989	X	1,890.75	Detailed study/Riverine	Medium High	7	8	4	6	5	5	5	15	4	52
Jackson	330014	{40EF1A41-9C8F-4E8A-8DA9-F6D7BB0DE91D}	Wildcat Brook (1112104.50, 602716.68)	7/2/1979	AE	3,476.46	Limited detailed study	Medium High	3	1	4	10	5	5	5	15	6	51
Freedom	330013	{BD6F6492-7FE6-4B8A-9342-520C41B9792F}	Ossipee River (1151866.28, 471544.57)	7/3/1995	A	8,620.30	Detailed study/Riverine	Medium High	2	2	8	2	5	5	5	15	8	50
Wolfeboro	330239	{B6005E63-0459-44EE-BB5F-FF6A9FF17181}	Crescent Lake (1107713.15, 397325.93)	5/17/1989	AE	6,537.02	Limited detailed study	Medium High	3	8	4	6	5	5	0	15	6	49
Jackson	330014	{37FE6ED6-4ABB-4AB4-B215-6013901BC493}	Unnamed (1110055.52, 600908.06)	7/2/1979	AE	2,124.35	Limited detailed study	Medium High	2	1	4	10	5	5	0	15	8	48
Tamworth	330018	{0295F0A8-2FBE-418C-9630-A8F9096DCD96}	Chocorua River (1096984.98, 513747.79)	7/16/1991	A	14,651.93	Detailed study/Riverine	Medium High	1	2	2	4	5	5	5	15	10	48
Wolfeboro	330239	{25B2FF2D-5D85-4DC6-AB2A-D98F96D5CAEB}	Ryefield Brook (1125214.47, 405030.95)	5/17/1989	A	1,377.03	Redelineation	Medium High	5	8	4	6	5	5	0	15	4	47
Wolfeboro	330239	{E3587649-DD10-4BF0-9D1F-D1665163EFC0}	Ryefield Brook (1134284.52, 405110.92)	5/17/1989	A	2,092.68	Redelineation	Medium High	10	8	4	6	5	5	0	15	4	47
Eaton	330204	{AA55F42A-273D-44C9-982D-1012638B76A8}	Conway Lake (1140886.36, 524549.78)	10/1/1976	A	6,614.82	Detailed study/Riverine	Medium High	1	1	0	10	5	5	0	15	10	46
Eaton	330204	{86097DD3-6DBA-45E9-B830-0E3784D11023}	Conway Lake (1143340.51, 522593.61)	10/1/1976	A	2,612.45	Detailed study/Riverine	Medium High	1	1	0	10	5	5	0	15	10	46
Eaton	330204	{DA5461D4-5A88-410B-8846-1D468DE766C2}	Conway Lake (1143390.64, 530381.34)	10/1/1976	A	3,960.29	Detailed study/Riverine	Medium High	1	1	0	10	5	5	0	15	10	46

**Appendix D. Prioritized flooding sources in Carroll County.—Continued**

[CID, Community Identification; FIS, Flood Insurance Studies; LOMC, Letter of Map Change]

Community	CID	Reach_ID	Description	Current analysis effective date	Current effective zone	Study reach length (ft)	Study type	Community priority range	Community priority	Population density score	Population growth score	Year since most recent FIS score	Significant area score	Development score	LOMC score	Community priority value	Community ranking value	Total score
Eaton	330204	{EF62BE0E-BC03-46EA-AD01-C460E2B1B215}	Conway Lake (1143397.90, 527631.34)	10/1/1976	A	2,750.73	Detailed study/Riverine	Medium High	1	1	0	10	5	5	0	15	10	46
Eaton	330204	{49C0DEBB-2EBA-4133-B29A-3340782A427E}	Conway Lake (1144050.65, 524531.36)	10/1/1976	A	3,283.47	Detailed study/Riverine	Medium High	1	1	0	10	5	5	0	15	10	46
Bartlett	330010	{C8CF0330-163B-440B-B261-03590DC1A8AA}	East Branch Saco River (1125642.86, 593435.01)	5/1/1979	AE	18,164.69	Limited detailed study	Medium High	2	2	2	8	5	5	0	15	8	45
Conway	330011	{7CB9B8B5-8ABB-4872-8362-4EBA5D709E36}	Saco River (1156020.58, 548900.44)	6/3/2002	AE with FI	5,164.23	Limited detailed study	Medium High	1	8	1	1	5	5	0	15	10	45
Conway	330011	{3EB624BE-5083-4E7F-9FDC-036C9D76D158}	Saco River (1121949.94, 570079.81)	6/3/2002	AE with FI	17,146.38	Limited detailed study	Medium High	4	8	1	1	5	5	5	15	4	44
Jackson	330014	{FC95E2B4-3ACC-438F-BD53-C80467940706}	Unnamed (1111754.30, 599678.08)	7/2/1979	AE	1,067.03	Limited detailed study	Medium High	4	1	4	10	5	5	0	15	4	44
Madison	330220	{E6C946BF-0BAF-454D-95C6-26833FC4DC45}	Davis Pond (1117058.75, 517598.53)	11/29/1977	A	3,348.46	Detailed study/Riverine	Medium High	1	2	2	10	0	5	0	15	10	44
Brookfield	330179	{20B0C77C-8304-4742-BB75-F67BF62A6903}	Churchill Brook (1144471.97, 383267.84)	5/17/1977	A	8,436.54	Detailed study/Riverine	Medium High	1	1	2	10	0	5	0	15	10	43
Conway	330011	{174D96E7-6909-4AE3-961D-7B8EBBB0DA33}	Saco River (1152999.40, 547489.96)	6/3/2002	AE with FI	3,564.02	Redelineation	Medium High	2	8	1	1	5	5	0	15	8	43
Freedom	330013	{8966D394-1875-45F2-92CA-82C9D649E338}	Ossipee River (1133522.20, 473033.00)	7/3/1995	AE	5,842.82	Redelineation	Medium High	3	2	8	2	5	0	5	15	6	43
Brookfield	330179	{8CCCEB3E-EDD1-47E6-B7A9-6E41F6E6B9F3}	Pike Brook (1149892.30, 381452.89)	5/17/1977	A	2,193.40	Detailed study/Riverine	Medium High	2	1	2	10	0	5	0	15	8	41
Conway	330011	{A2885C72-811E-4263-95D6-49208B4B7D9C}	Saco River (1129146.66, 549739.29)	6/3/2002	AE with FI	2,969.27	Redelineation	Medium High	3	8	1	1	5	5	0	15	6	41
Tamworth	330018	{9385A790-E3D2-49FD-A3C8-FDA144F3104D}	Bearcamp River (1092597.92, 485779.40)	7/16/1991	AE	6,631.73	Redelineation	Medium High	2	2	2	4	5	5	0	15	8	41
Conway	330011	{AD7CCAEE-1E4A-4499-A6E9-B7B18C4F4C5F}	Kearsarge Brook (1129485.32, 569523.79)	6/3/2002	AE with FI	3,684.26	Detailed study/Riverine	Medium	9	8	1	1	5	5	5	10	4	39
Conway	330011	{71C14AD8-E9FF-41C9-9C9D-B3D18C6AB3C6}	Pequawket Pond (1124440.49, 536502.49)	6/3/2002	AE	2,796.00	Redelineation	Medium	8	8	1	1	5	5	5	10	4	39
Moulton-borough	330015	{F11D4C61-2D9E-4102-891B-0C7EACB8F681}	Halfway Brook (1061097.68, 457570.89)	12/21/1979	A	11,247.67	Redelineation	Medium	5	4	10	1	5	0	5	10	4	39
Moulton-borough	330015	{E1A1B991-F862-476D-83DE-051BA0DE519C}	Lake Kanastaka (1036442.93, 447986.53)	12/21/1979	A	809.73	Redelineation	Medium	5	4	10	1	5	5	0	10	4	39
Moulton-borough	330015	{F66FE057-B0E6-4712-A1B1-BF79F1BA8B77}	Lake Winnepesaukee (1050911.89, 433982.36)	12/21/1979	A	3,181.54	Redelineation	Medium	5	4	10	1	5	5	0	10	4	39
Moulton-borough	330015	{51042343-9DD4-4B00-99EF-3BDFFB1FA34}	Shannon Brook (1073500.27, 444501.78)	12/21/1979	A	20,954.67	Redelineation	Medium	5	4	10	1	5	5	0	10	4	39

**Appendix D. Prioritized flooding sources in Carroll County.—Continued**

[CID, Community Identification; FIS, Flood Insurance Studies; LOMC, Letter of Map Change]

Community	CID	Reach_ID	Description	Current analysis effective date	Current effective zone	Study reach length (ft)	Study type	Community priority range	Community priority	Population density score	Population growth score	Year since most recent FIS score	Significant area score	Development score	LOMC score	Community priority value	Community ranking value	Total score
Moulton-borough	330015	{09279208-D33E-4633-B595-55527B3D85AD}	Unnamed (1057331.69, 455590.00)	12/21/1979	A	3,126.90	Redelineation	Medium	5	4	10	1	0	5	5	10	4	39
Tamworth	330018	{542779DC-B86A-424A-A6DC-655A4A108B3C}	Bearcamp River (1079190.49, 483502.59)	7/16/1991	AE	5,908.02	Detailed study/Riverine	Medium High	3	2	2	4	5	5	0	15	6	39
Tamworth	330018	{D58CEA92-74E8-4FDB-A2D4-FD2176762878}	Bearcamp River (1071750.91, 484023.74)	7/16/1991	AE	6,519.84	Redelineation	Medium High	4	2	2	4	5	5	0	15	4	37
Wolfeboro	330239	{E914141D-3689-42E7-BB2D-C8C57D83DE79}	Wiley Brook (1118835.81, 412927.20)	5/17/1989	A	2,635.98	Redelineation	Medium High	9	8	4	6	0	0	0	15	4	37
Conway	330011	{1D247CB2-54B1-44B9-BFBA-411A244C3DE2}	Middle River (1121073.32, 570027.91)	6/3/2002	AE with FI	4,467.90	Limited detailed study	Medium High	5	8	1	1	5	0	0	15	4	34
Conway	330011	{0922EACA-E3F4-4A31-AE96-8702F35261D6}	Saco River (1148291.75, 546589.17)	6/3/2002	AE with FI	5,998.19	Redelineation	Medium	6	8	1	1	5	5	0	10	4	34
Eaton	330204	{4699761F-AC13-46EB-9016-B940DA8E75BA}	Snow Brook (1140067.88, 522408.43)	10/1/1976	A	3,425.54	Detailed study/Riverine	Medium High	2	1	0	10	0	0	0	15	8	34
Moulton-borough	330015	{8E04ED19-6854-47A4-8DC4-B665263AFE69}	Lees Lake (1053419.15, 452456.29)	12/21/1979	A	1,937.08	Redelineation	Medium	5	4	10	1	5	0	0	10	4	34
Moulton-borough	330015	{A24AD2F9-2E51-40F6-B188-D705E453B7F8}	Red Hill River (1051214.82, 458382.16)	12/21/1979	A	8,337.37	Redelineation	Medium	5	4	10	1	5	0	0	10	4	34
Moulton-borough	330015	{F8C7E603-3EC6-493B-90E4-51783EFC10E6}	Red Hill River (1052504.52, 453332.53)	12/21/1979	A	3,306.80	Redelineation	Medium	5	4	10	1	5	0	0	10	4	34
Moulton-borough	330015	{AA6B8942-47F3-4566-8D31-AF7C6084ECAE}	Unnamed (1032646.83, 455845.97)	12/21/1979	A	1,850.82	Redelineation	Medium	5	4	10	1	0	5	0	10	4	34
Moulton-borough	330015	{E000B8F7-3FC4-4C5A-8E88-BDAE8137FEE7}	Unnamed (1047663.52, 445987.15)	12/21/1979	A	5,553.54	Redelineation	Medium	5	4	10	1	0	5	0	10	4	34
Moulton-borough	330015	{3B5ECAFE-81DC-4F62-91C5-D25AA799C78E}	Unnamed (1059621.45, 449830.84)	12/21/1979	A	1,559.38	Redelineation	Medium	5	4	10	1	0	5	0	10	4	34
Moulton-borough	330015	{33BA6BFF-F133-4869-B8C0-2687EB3997BC}	Unnamed (1061506.70, 452137.93)	12/21/1979	A	4,973.20	Redelineation	Medium	5	4	10	1	0	5	0	10	4	34
Moulton-borough	330015	{220481A2-4B3F-45D9-B32E-958AC0058B9B}	Unnamed (1066679.81, 450388.14)	12/21/1979	A	2,724.21	Redelineation	Medium	5	4	10	1	0	5	0	10	4	34
Wolfeboro	330239	{4036AAB2-103B-4870-81C1-6E56A66A38F4}	Harvey Brook (1103505.53, 404505.32)	5/17/1989	A	3,752.50	Redelineation	Medium	8	8	4	6	0	0	0	10	4	32
Freedom	330013	{4ED21A66-0B42-4008-920C-543F125B98ED}	Ossipee River (1160991.33, 472520.59)	7/3/1995	A	1,512.74	Redelineation	Medium	4	2	8	2	5	0	0	10	4	31
Conway	330011	{24C8CD74-094D-4FB1-9D40-89354C44CFF0}	Black Cat Brook (1154006.55, 545898.62)	6/3/2002	X	1,295.35	Detailed study/Riverine	Medium	7	8	1	1	0	5	0	10	4	29
Moulton-borough	330015	{AB469B64-4779-43D1-8C6C-E4DFD978C0FB}	Unnamed (1048538.72, 459794.63)	12/21/1979	A	3,845.11	Redelineation	Medium	5	4	10	1	0	0	0	10	4	29

**Appendix D. Prioritized flooding sources in Carroll County.—Continued**

[CID, Community Identification; FIS, Flood Insurance Studies; LOMC, Letter of Map Change]

Community	CID	Reach_ID	Description	Current analysis effective date	Current effective zone	Study reach length (ft)	Study type	Community priority range	Community priority	Population density score	Population growth score	Year since most recent FIS score	Significant area score	Development score	LOMC score	Community priority value	Community ranking value	Total score
Moulton-borough	330015	{6C8F6ACB-968D-409C-A5E8-6B5DB989294A}	Unnamed (1053850.64, 440191.90)	12/21/1979	A	2,463.42	Redelineation	Medium	5	4	10	1	0	0	0	10	4	29
Moulton-borough	330015	{0F6C90E9-8F69-4E11-A87C-7F2401E3E6CC}	Unnamed (1054821.64, 441318.03)	12/21/1979	A	6,402.36	Redelineation	Medium	5	4	10	1	0	0	0	10	4	29
Moulton-borough	330015	{1B68C2C3-7371-4D0E-9E09-54DAB92A3057}	Unnamed (1055776.40, 438907.89)	12/21/1979	A	2,979.97	Redelineation	Medium	5	4	10	1	0	0	0	10	4	29
Moulton-borough	330015	{1E2B893F-E96A-489D-A792-84CE75EF70DB}	Unnamed (1057031.08, 460587.48)	12/21/1979	A	4,815.03	Redelineation	Medium	5	4	10	1	0	0	0	10	4	29
Moulton-borough	330015	{22773AA9-494A-4EFF-A855-1D0AA7BE582E}	Unnamed (1059390.36, 465050.84)	12/21/1979	A	2,651.85	Redelineation	Medium	5	4	10	1	0	0	0	10	4	29
Moulton-borough	330015	{681DDDC4-15FE-41F9-BD4E-1FD2A0A3A64F}	Unnamed (1059931.40, 436508.97)	12/21/1979	A	10,286.57	Redelineation	Medium	5	4	10	1	0	0	0	10	4	29
Moulton-borough	330015	{2FE953D3-8AB3-410E-914F-11F3DE1A4C63}	Unnamed (1063893.38, 466029.38)	12/21/1979	A	651.02	Redelineation	Medium	5	4	10	1	0	0	0	10	4	29
Moulton-borough	330015	{F9026ED6-32D2-499E-A8D6-9398979659BD}	Unnamed (1063964.71, 462173.62)	12/21/1979	A	2,980.74	Redelineation	Medium	5	4	10	1	0	0	0	10	4	29
Moulton-borough	330015	{0BEE1DFD-2E8E-4252-8064-C5125EFB0DC7}	Weed Brook (1056539.63, 461540.38)	12/21/1979	A	5,153.89	Redelineation	Medium	5	4	10	1	0	0	0	10	4	29
Freedom	330013	{FF3140E3-53EB-4FD9-9C9E-BD5D68C1F115}	Cold Brook (1150534.90, 480643.51)	7/3/1995	A	2,944.13	Redelineation	Medium	6	2	8	2	0	0	0	10	4	26
Freedom	330013	{C1E25568-A50E-41A0-AE2F-58A7D8D09317}	Cold Brook (1156036.23, 473001.60)	7/3/1995	A	6,092.12	Redelineation	Medium	5	2	8	2	0	0	0	10	4	26



## Planning Level Cost Estimates for Carroll County

Planning level cost estimates are required to make an informed decision about the final extent of the flood insurance study revisions. Planning level estimates are based on \$10,000 per mile for detailed study flooding sources, \$3,000 per mile for limited detail study flooding sources and \$800 per mile for re-delineation using new topography. These costs are thought to be appropriate planning level estimates for New England, including mapping and survey, and excluding Digital Flood Insurance Rate Map (DFIRM) production and Digital Terrain Model (DTM) acquisition. DFIRM production is currently being undertaken by the University of New Hampshire Geographically Referenced ANalysis and Information Transfer system (UNH GRANIT) and no estimates of Baseline - DFIRM only costs have been made for this report. However, it is estimated that it would cost \$3,000 per DFIRM panel for DFIRM production. Detailed estimates for flood insurance studies will be provided by the U.S. Geological Survey (USGS) once project scope details are confirmed.

Detailed Restudy, Limited Detail Restudy and Redelineation: The cost to perform hydrologic and hydraulic restudies is estimated to be \$428,700 as listed in table 1. These costs include all of the stream segments highlighted in figure 4.

**Table 1.** Detailed restudy estimated costs for Carroll County, New Hampshire.

[DTM, Digital Terrain Model; LiDAR, Light Detection and Ranging]

<b>Carroll County hydrologic and hydraulic restudy</b>	<b>Unit rate</b>	<b>Stream miles</b>	<b>Amount</b>
Detailed Restudy of Zone X/A to Zone AE	\$10,000	27.8	\$278,000
Limited Detailed Study	\$3,000	11.7	\$35,100
Redelineation	\$800	32.0	\$25,600
<b>DTM acquisition</b>	<b>Square miles</b>		
DTM Data (LiDAR)	\$3,000	30	\$90,000
Carroll County total			\$428,700

