

Prepared for the Federal Emergency Management Agency, Region 1

Scoping of Flood Hazard Mapping Needs for Belknap County, New Hampshire

Open-File Report 2006–1201

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



Scoping of Flood Hazard Mapping Needs for Belknap County, New Hampshire

By Robert H. Flynn

Prepared for the
Federal Emergency Management Agency, Region 1

Open-File Report 2006–1201

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

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

U.S. Geological Survey
P. Patrick Leahy, Acting Director

U.S. Geological Survey, Reston, Virginia: 2006

For more information about the USGS and its products:
Telephone: 1-888-ASK-USGS
World Wide Web: <http://www.usgs.gov/>

Any use of trade, product, or firm names in this publication is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Although this report is in the public domain, permission must be secured from the individual copyright owners to reproduce any copyrighted materials contained within this report.

Contents

Section 1. Introduction	1
Background	1
Scope of Work	2
Section 2. Data Collected from Belknap County Communities	6
Community Flood Insurance Studies and Flood Insurance Rate Maps	6
Delineation of Detailed and Approximate Study Areas	7
Letters of Map Change	7
Letters of Map Change in Belknap County	8
Mapping Needs Update Support System	9
Mapping Needs in Belknap County, New Hampshire	9
State and Community Meetings	11
Meeting with New Hampshire Office of Emergency Management (NHOEM) and Scoping Team Members	11
Belknap County Community Meetings	12
Available Digital Mapping and Remotely Sensed Data	17
Data-Collection Efforts	17
NH GRANIT Data Sources	17
Community Data Resources	18
Stream Final Coverage Output	18
Section 3. Options for Future Mapping and Digital Terrain Model Preparation	20
Mapping Requirements	20
Base Map	20
Digital Terrain Models	21
Flood Insurance Risk Zones	22
Suitability of the Available Data	22
USGS of GRANIT	22
Community Data Resources	22
County Data Resources	22
Base Map	22
Digital Terrain Model	23
Flood Insurance Risk Zones	23
Mapping Options	24
Base Map	24
Digital Terrain Model	24
Flood Insurance Risk Zones	24
Section 4. Hydrologic and Hydraulic Restudy Needs and Prioritization	25
Mapping Needs	25
Prioritization Process	25
Prioritization Results	26
Non-Participating Communities	26
Section 5. Recommendations and Schedule	27
Mapping Recommendations	27
Mapping Options	27

Project Alternatives	27
Schedule	27
Selected References	28
Appendixes:	
Appendix A. Summary of Letters of Map Change (LOMC) Data in Belknap County	29
Appendix B. Mapping Needs Update Support System (MNUSS) Needs Assessment Reports	31
Appendix C. State and Community Meetings	33
Appendix D. Prioritized Flooding Sources	54

Figures

1. Belknap County, New Hampshire, location map	4
2. Belknap County, New Hampshire, hydrography and FEMA Digital Flood Insurance Rate Map (DFIRM) data	5
3. Letter of Map Change (LOMC) and community location map in Belknap County, New Hampshire.	8
4. Belknap County, New Hampshire, stream final coverage	19

Tables

1. Belknap County, New Hampshire, communities and populations	3
2. FIS and FIRM information for communities	6
3. Summary of specific mapping needs in Belknap County, New Hampshire	10
4. FIRM horizontal accuracy	21
5. National standard for spatial data accuracy	22
6. Currently available high resolution orthophotography for Belknap County	23
7. Estimate of costs to obtain Digital Terrain Model data (2-ft contours)	24
8. Community flooding source prioritization	26

CONVERSION FACTORS AND ABBREVIATIONS

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

Horizontal coordinate information is referenced to the insert datum name (and abbreviation) here for instance, "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 Belknap 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 Belknap 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 Belknap 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 Belknap County.

As of 2006, the average age of the FEMA flood plain maps in Belknap County, New Hampshire is 19.9 years. Most of these studies were computed in the late 1970s to the late 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.

Belknap County gained 5,222 residents between 2000 and 2005. This represents a growth of 9.3 percent compared to 6.0 percent for the state as a whole. Belknap County ranks first (from highest to lowest) out of New Hampshire's 10 counties in terms of rate of population increase. Since 1990, Belknap County has gained 12,331 residents (University of New Hampshire, 2005).

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 Belknap 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 Belknap 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 Belknap County.

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

Table 1. Belknap County, New Hampshire, communities and populations.

County/Town	Year 2000 population	Land area (square mile)	Population per square mile
Belknap County	56,325	401.2	140.4
Alton	4,502	63.1	71.3
Barnstead	3,886	41.9	92.7
Belmont	6,716	30.6	219.5
*Center Harbor	996	13.4	74.3
Gilford	6,803	39	174.4
*Gilmanton	3,060	57.1	53.6
Laconia	16,411	20.3	808.4
Meredith	5,943	40.2	147.8
New Hampton	1,950	36.7	53.1
Sanbornton	2,581	47.5	54.3
Tilton	3,477	11.4	305.0

*Not in the National Flood Program.



Figure 1. Belknap County, New Hampshire, location map.

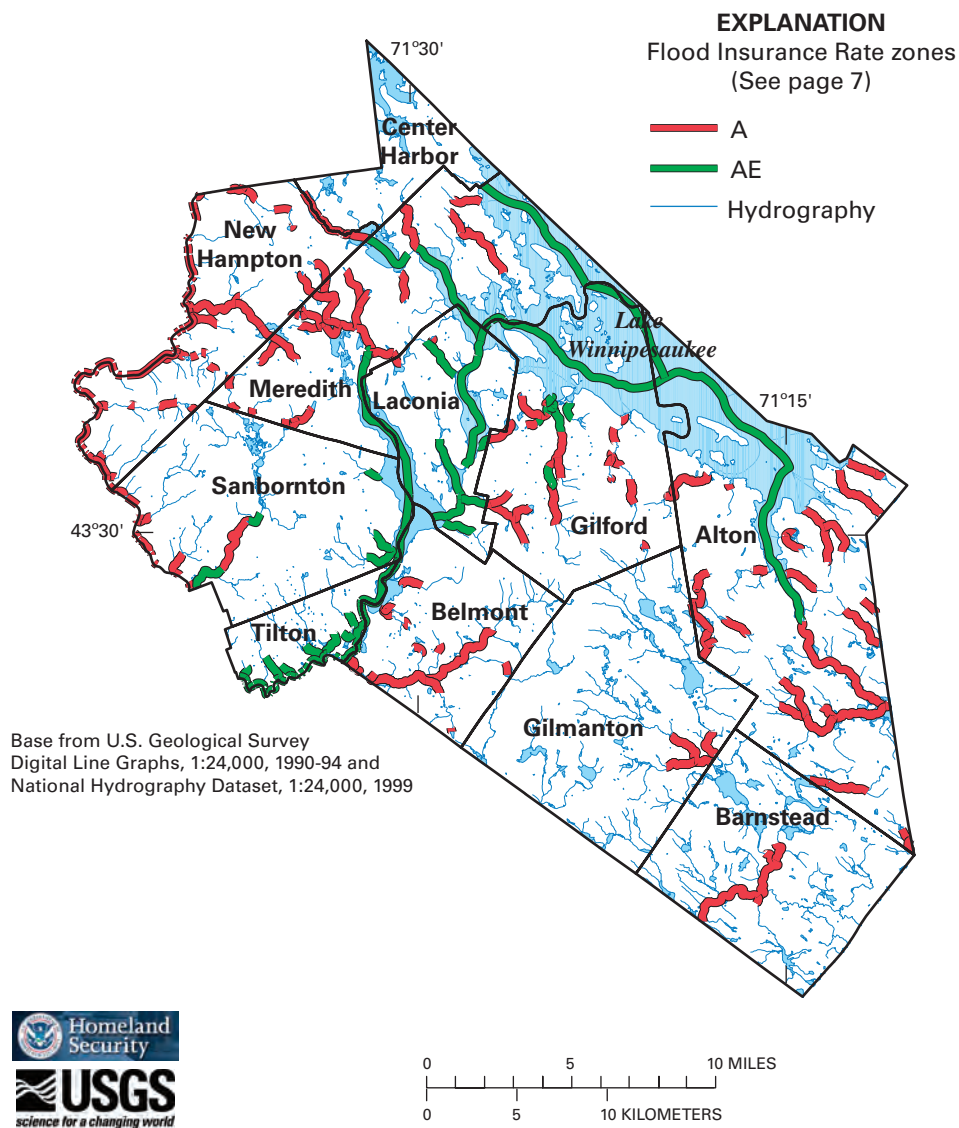


Figure 2. Belknap County, New Hampshire, hydrography and FEMA Digital Flood Insurance Rate Map (DFIRM) data.

Section 2. Data Collected from Belknap County Communities

This section provides a summary of the data-collection efforts for communities in Belknap 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 Belknap 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 Belknap 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	Initial FIRM/ FHBM date	Current effective map date
Alton	5/17/88	5/17/88	5/17/88
Barnstead	4/2/86	4/2/86	4/2/86
Belmont	9/1/89	9/2/89	9/2/89
*Center Harbor	--	--	--
Gilford	6/19/89	6/19/89	5/4/92
*Gilmanton	1/17/76	1/17/75	9/21/79
Laconia	8/15/80	8/15/80	8/15/80
Meredith	6/3/88	6/3/88	6/3/88
New Hampton	4/2/86	4/2/86	4/2/86
Sanbornton	6/15/79	6/15/79	NSFHA
Tilton	5/1/79	5/1/79	8/19/97

*Not in the National Flood Program.

The effective map dates for communities in the National Flood Program range from 1980 in the City of Laconia to 1997 in the Town of Tilton. Fifty percent of the FIRMs were produced prior to 1988 and are 16 years old or older. The oldest FIRM is 27 years old, the most recent is 9 years old, and the average is 18.8 years old. Most (over 77 percent) of the FIS analyses were performed between 1979 and 1989 and have not been updated.

Delineation of Detailed and Approximate Study Areas

Digital Q3 Flood Data have not been developed for Belknap 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 Belknap 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.

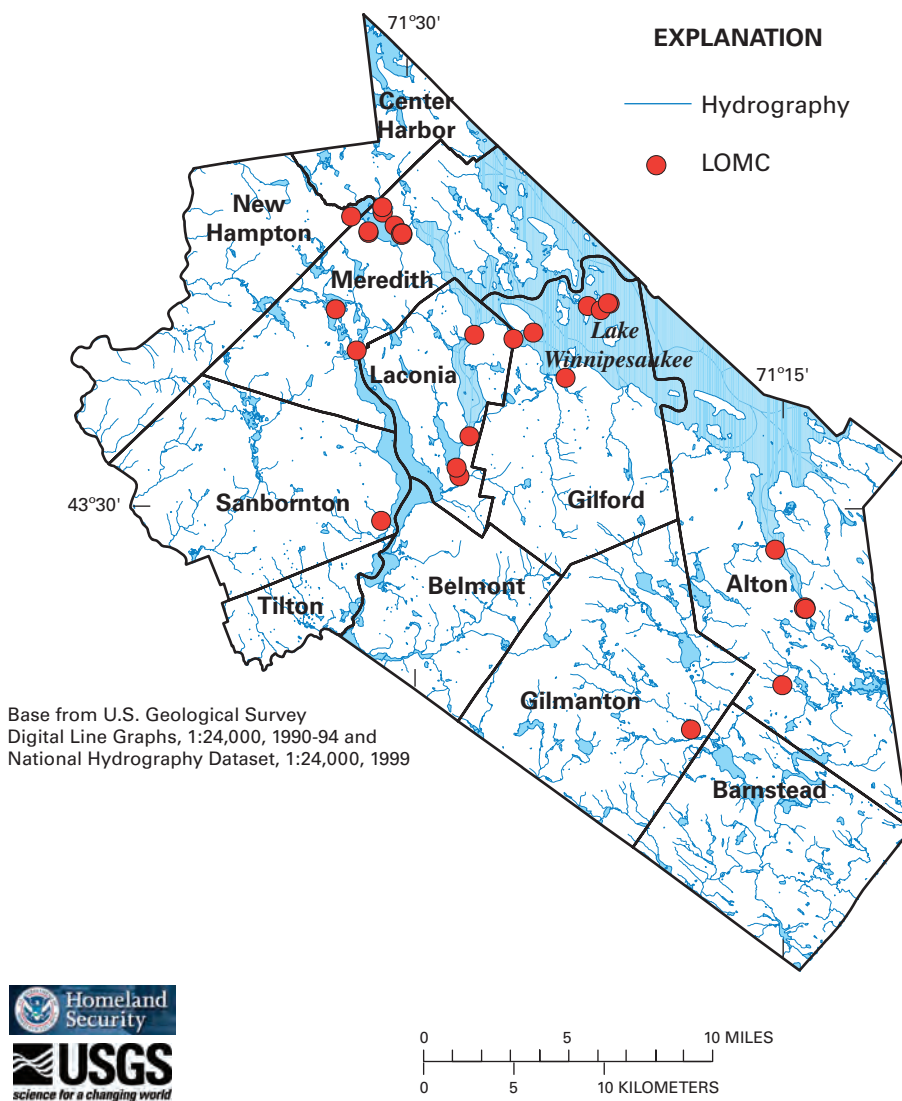


Figure 3. Letter of Map Change (LOMC) and community location map in Belknap County, New Hampshire.

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 Belknap County, New Hampshire

Information on mapping needs for the respective communities within Belknap 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 Belknap County, New Hampshire.

[BFE, Base Flood Elevation]

Community	Need identifier	Study category	Comments
Alton	25972	Riverine	Increase in BFE by between 1 and 5 ft on 6.25 mi of Lake Winnepesaukee.
	25973	Riverine	Changes to flood plain width resulting in an increase in BFE by between 1 and 5 ft on a 0.66 mi reach of Watson Brook.
Barnstead	10604	Maintenance	Add streets to panel.
Belmont	29265	Riverine	Changes to hydrologic conditions, hydraulic analysis and flood plain width with an anticipated BFE decrease of less than 1 foot on 0.4 mi of Sargent Lake.
	29268	Riverine	Changes to hydrologic conditions, hydraulic analysis and flood plain width with an anticipated BFE decrease of less than 1 foot on 0.3 mi of Pout Pond.
	29271	Riverine	Changes to hydrologic conditions, hydraulic analysis and flood plain width with an anticipated BFE decrease of less than 1 foot on 0.8 mi of Zone A swamp area bounded by Grey Rocks Road, Jefferson Road, Union Road and the B&M railroad tracks.
	29270	Riverine	Changes to hydrologic conditions, hydraulic analysis and flood plain width with an anticipated BFE decrease of less than 1 foot on 0.4 mi of Badger Pond.
	29272	Riverine	Changes to hydrologic conditions, hydraulic analysis and flood plain width with an anticipated BFE decrease of less than 1 foot on 0.6 mi bounded by Timothy Road, B&M tracks, and Tucker Shore Road.
	29273	Riverine	Changes to hydrologic conditions, hydraulic analysis and flood plain width with an anticipated BFE decrease of less than 1 foot on 1.4 mi of swamp area bounded by Hurricane Road, Seavey Road, and Bean Hill Road.
	29267	Riverine	Changes to hydrologic conditions, hydraulic analysis and flood plain width with an anticipated BFE decrease of less than 1 foot on 9 mi of the Tioga River from the confluence with Silver Lake to Route 107.
	29274	Riverine	Changes to hydrologic conditions, hydraulic analysis and flood plain width with an anticipated BFE decrease of less than 1 foot on 0.4 mi of Zone A area located on the southwest side of Hurricane Road.
	29264	Riverine	Changes to hydrologic conditions, hydraulic analysis and flood plain width with an anticipated BFE decrease of less than 1 foot on 9.5 mi of Winnisquam Lake.
	10605	Riverine	Changes to BFEs with an increase of greater than 5 ft along 1.1 mi of Silver Lake.
Belmont	29266	Riverine	Changes to hydrologic conditions, hydraulic analysis and flood plain width with an anticipated BFE decrease of less than 1 foot on 1 mile of Purgin Brook from the confluence with Winnisquam Lake to Horne Road.
	29269	Riverine	Changes to hydrologic conditions, hydraulic analysis and flood plain width with an anticipated BFE decrease of less than 1 foot along 2.6 mi of Pumping Station Brook from the confluence with the Tioga River to Clough Pond.
	10564	Riverine	Changes to hydrologic conditions with an anticipated decrease in BFE by less than 1 foot along 17.7 mi of Hunt Brook.

As shown in table 3, a total of 16 mapping update needs are listed in MNUSS throughout Belknap County. These include one map maintenance need and fifteen 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.

Belknap County Community Meetings

Conference calls were conducted with representatives from all of the towns in Belknap 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.

Belknap County:

Alton

The following list provides a summary of the key issues identified during the community interview (June 28, 2006):

- Development is occurring along the Merrymeeting River and the flood maps need to be updated along this river.

Contact: Cathy Currier, Assessing Office (603-875-2167).

Barnstead

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

- On panel 3, a detailed study is needed along Wheeler Brook from its confluence with the Suncook River to approximately 2,000 ft upstream due to development in this area.
- On panel 3, a detailed study is needed along Big River from its confluence with the Suncook River to 2,000 ft upstream due to development.

Contact: David Merli, Selectman (603-269-4071).

Belmont

The following list provides a summary of the key issues identified during the community interview (November 21, 2005 and December 5, 2005):

- On panel 5, a detailed study is needed to establish the base flood elevation (BFE) on Silver Lake (approximately 1.5 mi) due to development around the lake.

- On panels 1, 2, 3 and 5, a detailed study is needed to establish the BFE on Winnisquam Lake (approximately 9.5 mi) due to development around the lake. The lake is bounded by the towns of Laconia, Sanbornton, Belmont, Meredith, and Tilton and has a surface area of approximately 4,500 acres.
- On panels 9 and 10, a detailed study is needed to establish the BFE on Sargent Lake (approximately 0.4 mi) due to development around the lake.
- On panels 2 and 5, a detailed study is needed along the swamp area (approximately 0.8 mi) bounded by Grey Rocks Road, Jefferson Road, Union Road, and the B&M railroad tracks due to development.
- On panels 2 and 3, a detailed study is needed along the swamp area (approximately 0.6 mi) bounded by Timothy Drive, B&M railroad tracks, and Tucker Shore Road due to development.
- On panels 2 and 3, a detailed study is needed along Durgin (also called Tucker) Brook (approximately 1 mile) from Horne Road to Winnisquam Lake.
- On panels 5, 6, 7, 8, and 9, a detailed study is needed along the Tioga River (approximately 9.0 mi) from its confluence with Silver Lake to the Bean Dam on panel 7.
- On panels 5, 6, and 9, a detailed study is needed along the swamp area (approximately 1.4 mi) bounded by Hurricane Road, Seavey Road, and Bean Hill Road.
- On panels 5 and 6, a detailed study is needed along the swamp area (approximately 0.4 mi) southwest of Hurricane Road, near the intersection with Seavey Road.
- On panels 8, 9, and 12, a detailed study is needed along Pumping Station Brook from its confluence with the Tioga River to Shaker Road.
- There are many new roads in town that need to be included on the flood maps. E911 roads data are available for the town and the town has a GIS.
- NRCS data is available pertaining to flooding in Belmont.
- USGS topographic maps are thought to provide the best available data.
- There are dams located on Badger Pond, Sargent Lake (breached and re-built), Winnisquam Lake (hydro-electric dam with half in Lockmere and half in Belmont), and Tioga River (Bean Dam which NHDES wants removed and a breached dam near Eagle Court on panel 9).

Contact: Town officials present at meeting in Belmont: Candace Daigle, Town Planner; Donald McLelland, Town Administrator; Gary Boisvert, Building Code Enforcement Officer; and Rick Ball, Town Land Use Specialist (603-267-8300, ext. 13).

Gilford

The following list provides a summary of the key issues identified during the community interview (January 12, 2006, and February 6, 2006):

- The resolution on the maps is poor.
- A condominium unit by Lake Shore Road at Routes 11 and 11B is partly mapped in the flood zone and the town feels that it should not be in the flood zone - delineation issue.
- No other flood mapping issues.

Gilford

The following list provides a summary of the key issues identified during the community interview (February 6, 2006):

- On panel 4, a detailed study is needed along Nighthawk Hollow Brook from the corporate limit to Garret Hill Road due to development.
- On panel 4, a detailed study is needed along Ayers Branch from the confluence with Nighthawk Hollow Brook to Twigg Street due to improperly delineated flood zone and flooding that occurs over the road. This area is currently Zone A.
- On panel 4, a detailed study is needed along the Suncook River from the corporate limit to Mountain Road due to development and improperly delineated flood zone.

Contact: Tim Warren, Town Administrator and Assistant to the Board of Selectmen (603-225-3008).

Laconia

The following list provides a summary of the key issues identified during the community interview (January 19, 2006):

- Overall, it was felt that the maps reflect the flood prone areas very well.
- On panel 5, Beacon Street: The straight section by the river is Beacon Street East and the curved area from Church Street to South Main is Beacon Street West.
- On panel 4, on the bottom left of the map, Loughton Avenue should be spelled Leighton Avenue. Above the Huston-Morgan State Forest, Morgan Road is not a thru road. Above the Prescott State Forest, Hilliard Road is not a thru road. There is a new and very large development (1,000 + units) approximately where the "Elevation Reference Marks" annotation is in the map.
- On panel 3, on the bottom left of the map, Loughton Avenue should be spelled Leighton Avenue.
- On panel 2, the largest island in the water body is labeled as Plummer Island but the City refers to it as Christmas Island.
- On panel 1, at the very bottom of the map, the flood zone stops at Rollercoaster Road. The town feels that the flood plain should be extended to the other side of Rollercoaster Road. At the intersection of Rollercoaster Road and Route 3 (Daniel Webster Highway and also called Endicott Street by locals), the fourth road is Watson Road which then turns into Scenic Road at the corner and along the water. Midpoint along Scenic Road (approximately where "Zone C" is written), there is a new thru road that goes out to Route 3 and has approximately 200 new lots. On the Scenic Road is a huge detention basin that should be shown on the flood map.

Contact: Shanna B. Saunders, Director, City of Laconia Planning and Zoning (603-527-1264).

Meredith

The following list provides a summary of the key issues identified during the community interview (February 7, 2006 and June 17, 2006):

- On panel 10, there are causeways to the islands labeled "Zone X" on the northeast side of Lake Waukegan and these causeways flood. In addition, the tributary labeled as a "Zone A" and extending to Jeness Hill Road is not delineated correctly. Both of these are redelineation issues.

- On panel 10, Hawkins Brook (northwest of Meredith Bay and along Route 3) is not delineated correctly. Development is occurring in this area and a detailed study is needed.
- On panel 5, a detailed study is needed along Wickwas Lake due to development.
- On panel 5, a detailed study is needed along Swains Pond and the tributary from Winnisquam Lake to above Camp Waldron Road.
- On panel 5, a detailed study is needed along Mill Brook from the confluence of Collins Brook at Collins Road to Wickwas Lake.
- On panel 5, a detailed study is needed along Collins Brook from its confluence with Mill Brook at Collins Road to Pickerel Pond.
- On panel 5, a detailed study is needed above Old Stage Road for Hatch Brook wetland area as this area is not properly delineated.

Contact: John Edgar, Town Planner (603-279-4538).

New Hampton

The following list provides a summary of the key issues identified during the community interview (June 26, 2006):

- On panels 2, 7, 8, 9, 3, 4, and 1, the Pemigewasset River Zone A delineation, north of the Ayers island Dam (PSNH), is thought by the town to be not delineated correctly with several high elevation areas delineated as being in the flood plain. This land could potentially be developed in the future and a detailed study is requested along the Pemigewasset from Ayers Dam to the northern corporate limit.
- On panel 4, the Zone A area along Ames Brook is thought to not be delineated correctly. Southeast of the railroad tracks, the fields flood to a much greater extent than shown. The area is not developed but the town believes that this is ideal frontage for development. A detailed study is requested along Ames Brook from 2,000 ft southeast of the Boston and Maine Railway railroad tracks to the corporate limit.
- On panel 7, a detailed study is needed along Blake Brook from its confluence with the Pemigewasset River to upstream of its crossing with Brook Road. This area floods and there are a few houses, as well as open land, in this area.
- On panel 8, a tributary to the Pemigewasset River (along the southern side of Route 104 and under the "Back Road to Bristol," does not go over the road and there is significant ponding upstream of the "Back Road to Bristol." The Zone A flood area is not delineated correctly. This area is also known as "Dark Hollow."
- On panel 9, excavation has changed the flood boundaries along Harper Brook between Interstate Route 93 and Route 38. This area is zoned to be commercial and industrial and thus could potentially be developed in the future. A detailed study is requested for this area.
- On panel 9, between Route 38 and Dana Hill Road, there is a large wetland area that is not correctly delineated with the Zone A delineation. This area is not developed but the delineation is incorrect and redelineation is requested for this area.

- On panel 9, Magoon Brook is not delineated accurately and it is in a commercial and industrial zoned area. A detailed study is requested along Magoon Brook from Route 38 to the confluence with the Pemigewasset River.
- On panel 11, the southwestern side of Winona Lake is not delineated accurately near the annotation: “Zone A and “Winona Lake.” The land around the lake is developed.
- On panels 11 and 17, the Snake River Zone A is not delineated correctly due to wetlands. There is currently no development in this area although Center Harbor has development along this river. A detailed study is requested along this river.
- On panel 17, Lake Waukewan Zone A is not delineated accurately and there is development occurring around the lake. A detailed study is requested.
- On panel 15, a detailed study is needed on Pemigewasset Lake from Route 104 to the corporate limit due to flooding, development around the lake, and inaccurately defined Zone A boundary.
- On panel 16, development is occurring around Forest Pond and a detailed study is needed to inaccurate zone a delineation.

Contact: Barbara Lucas, Town Administrator (603-744-3559).

Sanbornton

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

- On panel 5, a detailed study is needed along Salmon Brook from the limit of 1979 detailed study above Tilton Bridge Road to the upstream corporate limit. This includes Hermit Lake and Cawley Pond, as well as the unnamed tributary east of Salmon Brook at the corporate limit. Study is needed due to development along Salmon Brook and new culverts at Hermit Woods Road.
- On panel 10, a detailed study is needed along Wallis Brook and Patterson Brook from Poplar Road to Hunkins Pond Road due to development.
- On panel 10, a detailed study is needed along a tributary into Black Brook from Hill Road to the confluence with Black Brook due to flooding and beaver dams.
- On panel 20, a detailed study is needed along Threshing Brook from its confluence with Salmon Brook to above Burleigh Hill Road.

Contact: Rob Jutton, Assessing Clerk (603-286-8303).

Tilton

The following list provides a summary of the key issues identified during the community interview (January 12, 2006):

- No flooding issues or issues with the accuracy of the FEMA maps.
- On panel 5, however, there is an area on Packer Brook from the confluence with the Winnepesaukee River to Chestnut Street (in the vicinity of BFE 450) in which the flood plain width is thought to be too wide.

Contact: Joe Plessener, Building Inspector (603-286-4521).

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 (LRPC), and the communities themselves. The NH GRANIT has useful base mapping available and these data are also being used by LRPC and the communities.

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 Belknap 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 Belknap 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 Belknap 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.

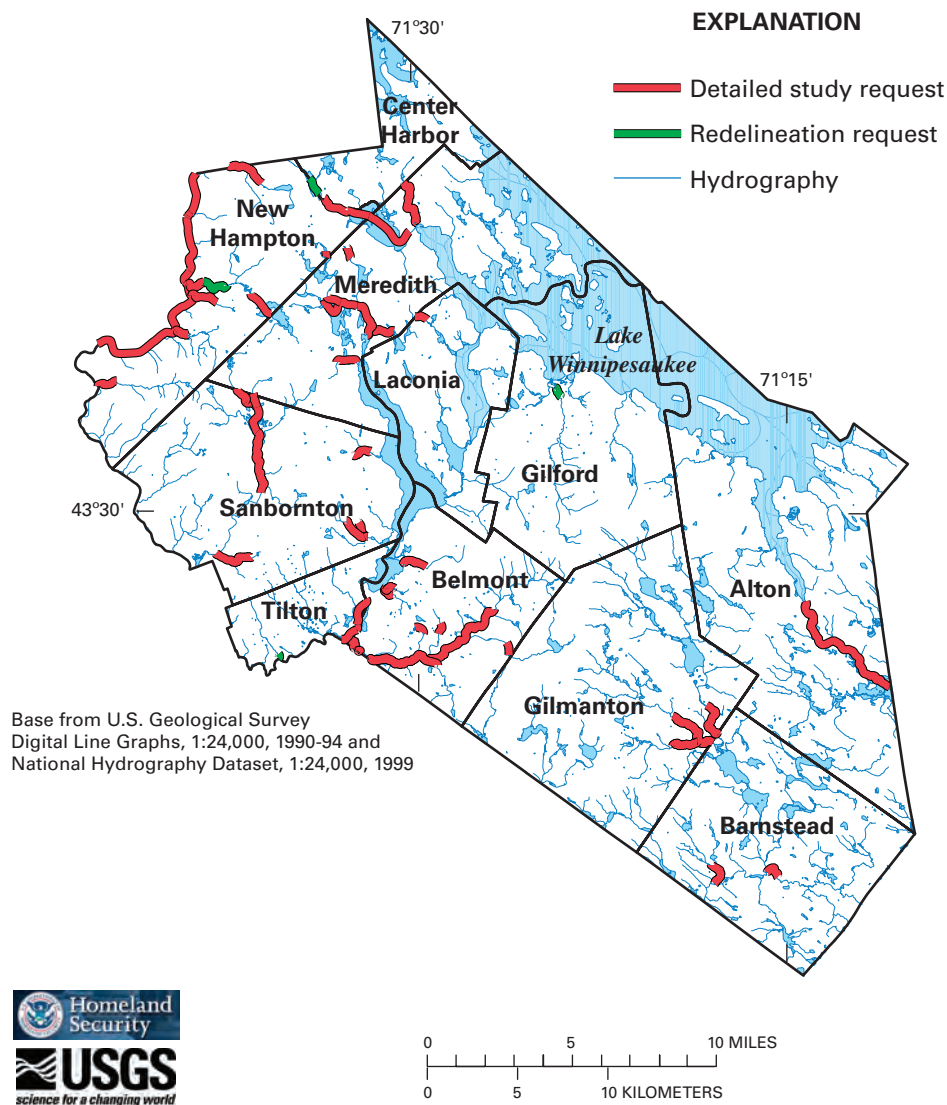


Figure 4. Belknap County, New Hampshire, stream final coverage.

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 Belknap 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) acquired from NH GRANIT 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]

FIRM map scale	Absolute horizontal accuracy at the 95-percent confidence level, in feet
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]

Contour interval	NSSDA	NSSDA
	90-percent confidence interval	95-percent confidence interval
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 Belknap 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 Belknap 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

Belknap County does not contain suitable data for DFIRM use. Towns in Belknap County are within the planning area of the Lakes Region Planning Commission. 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 Belknap 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 Belknap 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 Belknap 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 Belknap County is option #1.

Digital Terrain Model

There are no DTM data available that meet FEMA requirements for Belknap 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).

Area (square miles)	Unit cost (\$ per square mile)	Estimated cost
20	5,000	\$100,000
50	3,000	\$150,000
75	2,250	\$168,750
100	2,000	\$200,000
401	1,500	\$601,500
(All of Belknap County)		

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 Belknap 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 Belknap 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 Belknap County and is shown in table 8.

Table 8. Community flooding source prioritization.

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

Community population density (population per square mile)		1990–2000 percent population growth		Year since most recent FIS	
Range	Value	Range	Value	Range	Value
> 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
Significant areas (as defined by the community)		Existing or proposed development since FIS		Presence of LOMCs	
Range	Value	Range	Value	Range	Value
Yes	5	Yes	5	Yes	5
No	0	No	0	No	0
Community priority		Community ranking			
Range	Value	Range	Value		
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 Center Harbor and Gilmanton are not currently in the NFIP. The town of Gilmanton have a Flood Hazard Boundary Maps dated September 21, 1979 and town officials identified flooding sources of concern on these maps.

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 Belknap County, New Hampshire. The County has a total area of approximately 469 mi² and encompasses 1 city (Laconia) and 10 towns. The total land area for the county is 401 mi² and the total water area is 68 mi², most of which is part of Lake Winnepesaukee.

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
- 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, 2005, Carsey Institute, accessed online June 19, 2006, at <http://www.nneindicators.unh.edu/ShowOneRegion.asp?IndicatorID=1&FIPS=33001&>.
- 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 Belknap County

Table A-1. Summary of LOMC data in Belknap 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; LOMA-DEN, Letter of Map Amendment Non-Removal; 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
Alton, N.H.	LOMA	04-01-1660A	10/12/2004	Merrymeeting River	Baker Road	43.466	-71.233	Residential structure	X	Portions remain in the SFHA; Zone A.
Alton, N.H.	LOMA-OAS	03-01-0510A	2/24/2003	Unnamed flooding source	5 Route 140 Gilmanton Road	43.431	-71.249	Residential structure	X	Portions remain in the SFHA.
Alton, N.H.	LOMA	02-01-1650A	9/25/2002	Alton Bay/Lake Winnepesaukee	Loon Cove Road	43.496	-71.258	Structure	X	Portions remain in the SFHA.
Alton, N.H.	LOMA	01-01-0850	11/7/2001	Merrymeeting River	River Lake West Street	43.467	-71.234	Residential structure	X	Portions remain in the SFHA; Zone A.
Gilford, N.H.	LOMA	05-01-0949A	10/18/2005	Lake Winnepesaukee	--	43.618	-71.375	Structure	X	Portions remain in the SFHA.
Gilford, N.H.	LOMA	05-01-0094A	12/13/2004	Lake Winnepesaukee	4 Camp Island	43.618	-71.372	Structure	X	Portions remain in the SFHA.
Gilford, N.H.	LOMA	05-01-0833A	9/27/2005	Lake Winnepesaukee	1 Round Island	43.607	-71.38	Residential structure	X	Portions remain in the SFHA.
Gilford, N.H.	LOMA	05-01-0234A	4/6/2005	Lake Winnepesaukee	30 Mark Island	43.627	-71.399	Residential structure	X	Portions remain in the SFHA.
Gilford, N.H.	LOMA-DEN	04-01-1292A	8/5/2004	Lake Winnepesaukee/ Smith Cove	66 Wildwood Road	43.58	-71.396	Structure (not removed)	X	Zone A.
Gilford, N.H.	LOMA	01-01-0140A	11/14/2000	Lake Winnepesaukee	97 Shore Road	43.602	-71.417	Residential structure	X	Portions remain in the SFHA.
Gilmanton, N.H.	LOMA	04-01-1220A	9/2/2004	Nighthawk Hollow Brook	47 Nighthawk Hollow Drive	43.405	-71.31	Structure	C	Portions remain in the SFHA; Zone A.
Laconia, N.H.	LOMA	04-01-1132A	5/27/2004	Winnepesaukee River	13 Riverside Court	43.039	-71.969	Structure	B	Portions remain in the SFHA.
Laconia, N.H.	LOMA	05-01-0839A	10/13/2005	Opechee Lake/ Winnepesaukee River	51 Opechee Street	43.536	-71.471	Residential structure	C	Portions remain in the SFHA.
Laconia, N.H.	LOMA-OAS	03-01-1772A	10/14/2003	Black Brook	1197 Union Avenue	43.557	-71.454	Westernmost structure	C	Portions remain in the floodway.
Laconia, N.H.	LOMA	00-01-0578A	5/2/2000	Lake Winnepesaukee	614 Endicott Street East	43.596	-71.43	Structure	C	Portions remain in the SFHA.
Laconia, N.H.	LOMA-OAS	02-01-1280A	7/24/2002	Winnepesaukee River	148 Channel Lane	43.601	-71.458	Residential structure	C	Portions remain in the SFHA.
Meredith, N.H.	LOMA	03-01-0784A	3/24/2003	Winnisquam Lake	35 Stoney Brook Road	43.592	-71.537	Residential structure	X	Portions remain in the SFHA.
Meredith, N.H.	LOMA	02-01-0568A	6/5/2002	Wickwas Lake	4 Loon Point Road	43.607	-71.551	Structure	X	Portions remain in the SFHA; Zone A.
Meredith, N.H.	LOMA	03-01-0044A	11/27/2002	Lake Waukeewan	148 Winona Shores Road	43.658	-71.533	Structure	X	Portions remain in the SFHA.
Meredith, N.H.	LOMA	02-01-1530A	8/14/2002	Lake Waukeewan	150 Winona Shores Road	43.658	-71.532	Structure	X	Portions remain in the SFHA.
Meredith, N.H.	LOMA	05-01-0633A	8/25/2005	Lake Waukeewan	7 Canal Street	43.652	-71.505	Structure	X	Portions remain in the SFHA.
Meredith, N.H.	LOMA	04-01-0156A	11/13/2003	Lake Waukeewan	3 Canal Street	43.652	-71.504	Residential structure	X	Portions remain in the SFHA.
Meredith, N.H.	LOMA	03-01-2014A	10/20/2003	Lake Waukeewan	100 Water Street	43.656	-71.511	Residential structure	X	Portions remain in the SFHA.
Meredith, N.H.	LOMA	03-01-1850A	10/14/2003	Lake Waukeewan	15 Pike Island Road	43.663	-71.519	Residential structure	X	Portions remain in the SFHA.
Meredith, N.H.	LOMA	05-01-0345A	3/21/2005	Lake Waukeewan	79 Bonney Shores Road	43.665	-71.519	Residential structure	X	Portions remain in the SFHA.
New Hampton, N.H.	LOMA	00-01-1088A	11/30/2000	Lake Waukeewan	84 Seminole Avenue	43.661	-71.543	Residential structure	C	Portions remain in the SFHA; Zone A.
Sanbornton, N.H.	LOMA-OAS	02-01-0530A	2/22/2002	Tributary A	148 Bay Road	43.512	-71.522	Residential structure	C	Portions remain in the floodway.

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

Belknap 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.

CID	Community name	Flood data update	Map maintenance	Pending	Resolved
330001	Alton, Town of	2	0	0	0
330177	Barnstead, Town of	0	1	0	0
330002	Belmont, Town of	12	0	0	0
330004	Gilford, Town of	0	0	0	0
330208	Gilmanton, Town of	0	0	0	0
330005	Laconia, City of	0	0	0	0
330006	Meredith, Town of	0	0	0	0
330007	New Hampton, City of	0	0	0	0
330008	Sanbornton, Town of	0	0	0	0
330009	Tilton, Town of	1	0	0	0
	Total	15	1	0	0

Appendix C. State and Community Meetings

GENERAL COMMUNITY INFORMATION

Community:	ALTON, TOWN OF	CID:	330001
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	10000000025972	Entered By:	Tim Witt
Source:	Other	Date:	10/01/2001
		Approved By:	Automatic (no FEMA validation)
		Date:	1/14/02

Study Category:	RIVERINE	Need Types:	Changes to BFEs
Flooding Source:	Lake Winnepesaukee		

Status:	Existing
---------	----------

NEED FLOODPLAIN DATA

Anticipated BFE Change:	Increased By Between 1 and 5 feet
Length of Study:	6.25 miles
Average Width of Floodplain:	500 feet
Location of Floodplain:	

PANELS AFFECTED BY THE NEED

3300010010B (05/17/1988)

ORIGIN OF NEED INFORMATION

Entity:	Region I Office	Phone:	<i>Unspecified</i>	Ext:	<i>Unspecified</i>
Last Name:	<i>Unspecified</i>	First Name:	<i>Unspecified</i>		
Address 1:	<i>Unspecified</i>	Title:	<i>Unspecified</i>		
Address 2:	<i>Unspecified</i>	Email:	<i>Unspecified</i>		
City:	<i>Unspecified</i>	Fax:	<i>Unspecified</i>		
State:	<i>Unspecified</i>	Zip:	<i>Unspecified</i>		

NEED NOTES AND COMMENTS

There are no notes for this need.

GENERAL COMMUNITY INFORMATION

Community:	ALTON, TOWN OF	CID:	330001
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	10000000025973	Entered By:	Tim Witt
Source:	Other	Date:	10/01/2001
		Approved By:	Automatic (no FEMA validation)
		Date:	1/14/02

Study Category:	RIVERINE	Need Types:	Changes to floodplain width
Flooding Source:	Watson Brook		

Status:	Existing
---------	----------

NEED FLOODPLAIN DATA

Anticipated BFE Change:	Increased By Between 1 and 5 feet
Length of Study:	0.66 miles
Average Width of Floodplain:	500 feet
Location of Floodplain:	

PANELS AFFECTED BY THE NEED

3300010020B (05/17/1988)

ORIGIN OF NEED INFORMATION

Entity:	Region I Office	Phone:	Unspecified	Ext:	Unspecified
Last Name:	Unspecified	First Name:	Unspecified		
Address 1:	Unspecified	Title:	Unspecified		
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:	BARNSTEAD, TOWN OF	CID:	330177
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	100000000010604	Entered By:	Chuck Wood
Source:	FEMA 5-year letter	Date:	03/16/1998
		Approved By:	FEMA
		Date:	3/16/98
Study Category:	MAINTENANCE	Need Types:	Add streets to panel
Status:	Existing		

PANELS AFFECTED BY THE NEED

No panels have been associated with this need.

ORIGIN OF NEED INFORMATION

Entity:	BARNSTEAD, TOWN OF	Phone:	6032694071	Ext:	<i>Unspecified</i>
Last Name:	BARNARD	First Name:	SUSAN L.		
Address 1:	<i>Unspecified</i>	Title:	<i>Unspecified</i>		
Address 2:	<i>Unspecified</i>	Email:	<i>Unspecified</i>		
City:	<i>Unspecified</i>	Fax:	<i>Unspecified</i>		
State:	<i>Unspecified</i>	Zip:	<i>Unspecified</i>		

NEED NOTES AND COMMENTS

There are no notes for this need.

GENERAL COMMUNITY INFORMATION

Community:	BELMONT, TOWN OF	CID:	330002
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	100000000029265	Entered By:	Kara Deutsch
Source:	State Implementation Plan	Date:	09/28/2002
		Approved By:	Automatic (no FEMA validation)
		Date:	11/12/02
Study Category:	RIVERINE	Need Types:	Changes to hydrologic conditions Changes to hydraulic analysis Changes to floodplain width
Flooding Source:	SARGENT LAKE		
Status:	Existing		

NEED FLOODPLAIN DATA

Anticipated BFE Change:	Decreased By Less Than 1 foot
Length of Study:	0.4 miles
Average Width of Floodplain:	2300 feet
Location of Floodplain:	

PANELS AFFECTED BY THE NEED

No panels have been associated with this need.

ORIGIN OF NEED INFORMATION

Entity:	BELMONT PLANNING & LAND USE DEPARTMENT	Phone:	(603) 267-8300	Ext:	13
Last Name:	DAIGLE	First Name:	CANDACE		
Address 1:	143 MAIN STREET	Title:	PLANNER		
Address 2:	P.O. BOX 310	Email:	cdaigle@belmontnh.org		
City:	BELMONT	Fax:	(603) 267-8327		
State:	NH	Zip:	03220		

NEED NOTES AND COMMENTS

Date	Entered By	Note
09/28/2002	Kara Deutsch	Zone A - currently under development.

GENERAL COMMUNITY INFORMATION

Community:	BELMONT, TOWN OF	CID:	330002
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	100000000029268	Entered By:	Kara Deutsch
Source:	State Implementation Plan	Date:	09/28/2002
		Approved By:	Automatic (no FEMA validation)
		Date:	11/12/02
Study Category:	RIVERINE	Need Types:	Changes to hydrologic conditions Changes to hydraulic analysis Changes to floodplain width
Flooding Source:	POUT POND		
Status:	Existing		

NEED FLOODPLAIN DATA

Anticipated BFE Change:	Decreased By Less Than 1 foot
Length of Study:	0.3 miles
Average Width of Floodplain:	1600 feet
Location of Floodplain:	

PANELS AFFECTED BY THE NEED

No panels have been associated with this need.

ORIGIN OF NEED INFORMATION

Entity:	BELMONT PLANNING & LAND USE DEPARTMENT	Phone:	(603) 267-8300	Ext:	13
Last Name:	DAIGLE	First Name:	CANDACE		
Address 1:	143 MAIN STREET	Title:	PLANNER		
Address 2:	P.O. BOX 310	Email:	cdaigle@belmontnh.org		
City:	BELMONT	Fax:	(603) 267-8327		
State:	NH	Zip:	03220		

NEED NOTES AND COMMENTS

There are no notes for this need.

GENERAL COMMUNITY INFORMATION

Community:	BELMONT, TOWN OF	CID:	330002
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	100000000029271	Entered By:	Kara Deutsch
Source:	Other	Date:	09/28/2002
		Approved By:	Automatic (no FEMA validation)
		Date:	11/12/02

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

Flooding Source:	ZONE A
------------------	--------

Status:	Existing
---------	----------

NEED FLOODPLAIN DATA

Anticipated BFE Change:	Decreased By Less Than 1 foot
Length of Study:	0.8 miles
Average Width of Floodplain:	1000 feet
Location of Floodplain:	Grey Rocks Road to Union Road

PANELS AFFECTED BY THE NEED

No panels have been associated with this need.

ORIGIN OF NEED INFORMATION

Entity:	BELMONT PLANNING & LAND USE DEPARTMENT	Phone:	(603) 267-8300	Ext:	13
Last Name:	DAIGLE	First Name:	CANDACE		
Address 1:	143 MAIN STREET	Title:	PLANNER		
Address 2:	P.O. BOX 310	Email:	cdaigle@belmontnh.org		
City:	BELMONT	Fax:	(603) 267-8327		
State:	NH	Zip:	03220		

NEED NOTES AND COMMENTS

Date	Entered By	Note
09/28/2002	Kara Deutsch	Development around Zone A swamp area bound by Grey Rocks Rd., Jefferson Rd., Union Rd., and B&M Railroad tracks.

GENERAL COMMUNITY INFORMATION

Community:	BELMONT, TOWN OF	CID:	330002
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	100000000029270	Entered By:	Kara Deutsch
Source:	State Implementation Plan	Date:	09/28/2002
		Approved By:	Automatic (no FEMA validation)
		Date:	11/12/02
Study Category:	RIVERINE	Need Types:	Changes to hydrologic conditions Changes to hydraulic analysis Changes to floodplain width
Flooding Source:	BADGER POND		
Status:	Existing		

NEED FLOODPLAIN DATA

Anticipated BFE Change:	Decreased By Less Than 1 foot
Length of Study:	0.4 miles
Average Width of Floodplain:	600 feet
Location of Floodplain:	

PANELS AFFECTED BY THE NEED

No panels have been associated with this need.

ORIGIN OF NEED INFORMATION

Entity:	BELMONT PLANNING & LAND USE DEPARTMENT	Phone:	(603) 267-8300	Ext:	13
Last Name:	DAIGLE	First Name:	CANDACE		
Address 1:	143 MAIN STREET	Title:	PLANNER		
Address 2:	P.O. BOX 310	Email:	cdaigle@belmontnh.org		
City:	BELMONT	Fax:	(603) 267-8327		
State:	NH	Zip:	03220		

NEED NOTES AND COMMENTS

There are no notes for this need.

GENERAL COMMUNITY INFORMATION

Community:	BELMONT, TOWN OF	CID:	330002
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	100000000029272	Entered By:	Kara Deutsch
Source:	State Implementation Plan	Date:	09/28/2002
		Approved By:	Automatic (no FEMA validation)
		Date:	11/12/02
Study Category:	RIVERINE	Need Types:	Changes to hydrologic conditions Changes to hydraulic analysis Changes to floodplain width
Flooding Source:	ZONE A		
Status:	Existing		

NEED FLOODPLAIN DATA

Anticipated BFE Change:	Decreased By Less Than 1 foot
Length of Study:	0.6 miles
Average Width of Floodplain:	1200 feet
Location of Floodplain:	Tucker Shore Road to Timothy Drive

PANELS AFFECTED BY THE NEED

No panels have been associated with this need.

ORIGIN OF NEED INFORMATION

Entity:	BELMONT PLANNING & LAND USE DEPARTMENT	Phone:	(603) 267-8300	Ext:	13
Last Name:	DAIGLE	First Name:	CANDACE		
Address 1:	143 MAIN STREET	Title:	PLANNER		
Address 2:	P.O. BOX 310	Email:	cdaigle@belmontnh.org		
City:	BELMONT	Fax:	(603) 267-8327		
State:	NH	Zip:	03220		

NEED NOTES AND COMMENTS

Date	Entered By	Note
09/28/2002	Kara Deutsch	Development in Zone A swamp area bounded by Timothy Rd., B&M tracks, and Tucker Shore Rd.

GENERAL COMMUNITY INFORMATION

Community:	BELMONT, TOWN OF	CID:	330002
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	100000000029273	Entered By:	Kara Deutsch
Source:	State Implementation Plan	Date:	09/28/2002
		Approved By:	Automatic (no FEMA validation)
		Date:	11/12/02
Study Category:	RIVERINE	Need Types:	Changes to hydrologic conditions Changes to hydraulic analysis Changes to floodplain width
Flooding Source:	ZONE A		
Status:	Existing		

NEED FLOODPLAIN DATA

Anticipated BFE Change:	Decreased By Less Than 1 foot
Length of Study:	1.4 miles
Average Width of Floodplain:	600 feet
Location of Floodplain:	Hurricane Road to Seavey Road

PANELS AFFECTED BY THE NEED

No panels have been associated with this need.

ORIGIN OF NEED INFORMATION

Entity:	BELMONT PLANNING & LAND USE DEPARTMENT	Phone:	(603) 267-8300	Ext:	13
Last Name:	DAIGLE	First Name:	CANDACE		
Address 1:	143 MAIN STREET	Title:	PLANNER		
Address 2:	P.O. BOX 310	Email:	cdaigle@belmontnh.org		
City:	BELMONT	Fax:	(603) 267-8327		
State:	NH	Zip:	03220		

NEED NOTES AND COMMENTS

Date	Entered By	Note
09/28/2002	Kara Deutsch	Development in Zone A swamp area bound by Hurricane Road, Seavey Road and Bean Hill Road.

GENERAL COMMUNITY INFORMATION

Community:	BELMONT, TOWN OF	CID:	330002
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	100000000029267	Entered By:	Kara Deutsch
Source:	State Implementation Plan	Date:	09/28/2002
		Approved By:	Automatic (no FEMA validation)
		Date:	11/12/02
Study Category:	RIVERINE	Need Types:	Changes to hydrologic conditions Changes to hydraulic analysis Changes to floodplain width
Flooding Source:	Tioga River		
Status:	Existing		

NEED FLOODPLAIN DATA

Anticipated BFE Change:	Decreased By Less Than 1 foot
Length of Study:	9 miles
Average Width of Floodplain:	200 feet
Location of Floodplain:	confluence with Silver Lake to Rt. 107 (Province Road)

PANELS AFFECTED BY THE NEED

No panels have been associated with this need.

ORIGIN OF NEED INFORMATION

Entity:	BELMONT PLANNING & LAND USE DEPARTMENT	Phone:	(603) 267-8300	Ext:	13
Last Name:	DAIGLE	First Name:	CANDACE		
Address 1:	143 MAIN STREET	Title:	PLANNER		
Address 2:	P.O. BOX 310	Email:	cdaigle@belmontnh.org		
City:	BELMONT	Fax:	(603) 267-8327		
State:	NH	Zip:	03220		

NEED NOTES AND COMMENTS

There are no notes for this need.

GENERAL COMMUNITY INFORMATION

Community:	BELMONT, TOWN OF	CID:	330002
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	100000000029274	Entered By:	Kara Deutsch
Source:	State Implementation Plan	Date:	09/28/2002
		Approved By:	Automatic (no FEMA validation)
		Date:	11/12/02
Study Category:	RIVERINE	Need Types:	Changes to hydrologic conditions Changes to hydraulic analysis Changes to floodplain width
Flooding Source:	ZONE A		
Status:	Existing		

NEED FLOODPLAIN DATA

Anticipated
BFE Decreased By Less Than 1 foot
Change:
Length of
Study: 0.4 miles
Average
Width of 600 feet
Floodplain:
Location of Seavey Road to Hurricane Road (Southwest side of Hurricane Road)
Floodplain:

PANELS AFFECTED BY THE NEED

No panels have been associated with this need.

ORIGIN OF NEED INFORMATION

Entity:	BELMONT PLANNING & LAND USE DEPARTMENT	Phone:	(603) 267-8300	Ext:	13
Last Name:	DAIGLE	First Name:	CANDACE		
Address 1:	143 MAIN STREET	Title:	PLANNER		
Address 2:	P.O. BOX 310	Email:	cdaigle@belmontnh.org		
City:	BELMONT	Fax:	(603) 267-8327		
State:	NH	Zip:	03220		

NEED NOTES AND COMMENTS

Date	Entered By	Note
09/28/2002	Kara Deutsch	Development near Zone A. This area is on the southwest side of Hurricane Road.

GENERAL COMMUNITY INFORMATION

Community:	BELMONT, TOWN OF	CID:	330002
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	100000000029264	Entered By:	Kara Deutsch
Source:	State Implementation Plan	Date:	09/28/2002
		Approved By:	Automatic (no FEMA validation)
		Date:	11/12/02

Study Category:	RIVERINE	Need Types:	Changes to hydrologic conditions Changes to hydraulic analysis Changes to floodplain width
Flooding Source:	WINNISQUAM LAKE		

Status:	Existing
---------	----------

NEED FLOODPLAIN DATA

Anticipated BFE Change:	Decreased By Less Than 1 foot
Length of Study:	9.5 miles
Average Width of Floodplain:	6300 feet
Location of Floodplain:	

PANELS AFFECTED BY THE NEED

No panels have been associated with this need.

ORIGIN OF NEED INFORMATION

Entity:	BELMONT PLANNING & LAND USE DEPARTMENT	Phone:	(603) 267-8300	Ext:	13
Last Name:	DAIGLE	First Name:	CANDACE		
Address 1:	143 MAIN STREET	Title:	PLANNER		
Address 2:	P.O. BOX 310	Email:	cdaigle@belmontnh.org		
City:	BELMONT	Fax:	(603) 267-8327		
State:	NH	Zip:	03220		

NEED NOTES AND COMMENTS

Date	Entered By	Note
09/28/2002	Kara Deutsch	Development around lake in surrounding towns. Currently Zone A.

GENERAL COMMUNITY INFORMATION

Community:	BELMONT, TOWN OF	CID:	330002
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	100000000010605	Entered By:	Chuck Wood
Source:	FEMA 5-year letter	Date:	06/08/1999
		Approved By:	FEMA
		Date:	6/8/99
Study Category:	RIVERINE	Need Types:	Changes to BFEs
Flooding Source:	Silver Lake		
Status:	Existing		

NEED FLOODPLAIN DATA

Anticipated BFE Change:	Increased By Greater Than 5 feet
Length of Study:	1.1 miles
Average Width of Floodplain:	1600 feet
Location of Floodplain:	

PANELS AFFECTED BY THE NEED

3300029999 (09/01/1989)

ORIGIN OF NEED INFORMATION

Entity:	BELMONT, TOWN OF [PLNNING BOARD]	Phone:	2678300	Ext:	<i>Unspecified</i>
Last Name:	DAIGLE	First Name:	CANDACE		
Address 1:	TOWN OF BELMONT	Title:	PLANNING ADMINISTRATOR		
Address 2:	P.O. BOX 310	Email:	<i>Unspecified</i>		
City:	BELMONT	Fax:	<i>Unspecified</i>		
State:	NH	Zip:	03220-0310		

NEED NOTES AND COMMENTS

Date	Entered By	Note
06/08/1999	Chuck Wood	ADD ELEVATIONS TO SILVER LAKE. ALSO WINNIPESAUKEE RIVER NEEDS A MODEL FOR MANAGING THE FLOW OF WATER.
06/08/1999	Chuck Wood	ADD ELEVATIONS TO SILVER LAKE. ALSO WINNIPESAUKEE RIVER NEEDS A MODEL FOR MANAGING THE FLOW OF WATER.

GENERAL COMMUNITY INFORMATION

Community:	BELMONT, TOWN OF	CID:	330002
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	100000000029266	Entered By:	Kara Deutsch
Source:	State Implementation Plan	Date:	09/28/2002
		Approved By:	Automatic (no FEMA validation)
		Date:	11/12/02
Study Category:	RIVERINE	Need Types:	Changes to hydrologic conditions Changes to hydraulic analysis Changes to floodplain width
Flooding Source:	PURGIN BROOK		
Status:	Existing		

NEED FLOODPLAIN DATA

Anticipated BFE Change:	Decreased By Less Than 1 foot
Length of Study:	1 miles
Average Width of Floodplain:	400 feet
Location of Floodplain:	confluence with Winnisquam Lake to Horne Road

PANELS AFFECTED BY THE NEED

No panels have been associated with this need.

ORIGIN OF NEED INFORMATION

Entity:	BELMONT PLANNING & LAND USE DEPARTMENT	Phone:	(603) 267-8300	Ext:	13
Last Name:	DAIGLE	First Name:	CANDACE		
Address 1:	143 MAIN STREET	Title:	PLANNER		
Address 2:	P.O. BOX 310	Email:	cdaigle@belmontnh.org		
City:	BELMONT	Fax:	(603) 267-8327		
State:	NH	Zip:	03220		

NEED NOTES AND COMMENTS

Date	Entered By	Note
09/28/2002	Kara Deutsch	Zone A

GENERAL COMMUNITY INFORMATION

Community:	BELMONT, TOWN OF	CID:	330002
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	100000000029269	Entered By:	Kara Deutsch
Source:	State Implementation Plan	Date:	09/28/2002
		Approved By:	Automatic (no FEMA validation)
		Date:	11/12/02
Study Category:	RIVERINE	Need Types:	Changes to hydrologic conditions Changes to hydraulic analysis Changes to floodplain width
Flooding Source:	PUMPING STATION BROOK		
Status:	Existing		

NEED FLOODPLAIN DATA

Anticipated BFE Change:	Decreased By Less Than 1 foot
Length of Study:	2.6 miles
Average Width of Floodplain:	200 feet
Location of Floodplain:	confluence with Tioga River to Clough Pond

PANELS AFFECTED BY THE NEED

No panels have been associated with this need.

ORIGIN OF NEED INFORMATION

Entity:	BELMONT PLANNING & LAND USE DEPARTMENT	Phone:	(603) 267-8300	Ext:	13
Last Name:	DAIGLE	First Name:	CANDACE		
Address 1:	143 MAIN STREET	Title:	PLANNER		
Address 2:	P.O. BOX 310	Email:	cdaigle@belmontnh.org		
City:	BELMONT	Fax:	(603) 267-8327		
State:	NH	Zip:	03220		

NEED NOTES AND COMMENTS

There are no notes for this need.

GENERAL COMMUNITY INFORMATION

Community:	TILTON, TOWN OF	CID:	330009
County:	BELKNAP COUNTY	State:	New Hampshire

NEED DETAIL INFORMATION

Need ID:	100000000010564	Entered By:	Chuck Wood
Source:	FEMA Future File	Date:	06/08/1999
		Approved By:	FEMA
		Date:	6/8/99
Study Category:	RIVERINE	Need Types:	Changes to hydrologic conditions
Flooding Source:	HUNT BROOK		
Status:	Existing		

NEED FLOODPLAIN DATA

Anticipated BFE Change:	Decreased By Less Than 1 foot
Length of Study:	17.7 miles
Average Width of Floodplain:	2500 feet
Location of Floodplain:	

PANELS AFFECTED BY THE NEED

3300090005C (08/19/1997)

ORIGIN OF NEED INFORMATION

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

NEED NOTES AND COMMENTS

Date	Entered By	Note
06/08/1999	Chuck Wood	IN A LETTER DATED 10/8/91 TO HQ, IT WAS NOTED THAT HUNT BROOK FLOW INTO ICE HOUSE POND ON THE EFFECTIVE. HOWEVER, THERE IS RECENT TOPO INFO. THAT SHOWS HUNT BROOK AS A TRIBUTARY TO GULF BROOK.
06/08/1999	Chuck Wood	IN A LETTER DATED 10/8/91 TO HQ, IT WAS NOTED THAT HUNT BROOK FLOW INTO ICE HOUSE POND ON THE EFFECTIVE. HOWEVER, THERE IS RECENT TOPO INFO. THAT SHOWS HUNT BROOK AS A TRIBUTARY TO GULF BROOK.

FEMA Map Modernization Program Belknap 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 (Belknap, 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 Belknap 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 in 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.

Belknap County Interview Form FEMA Map Modernization Program

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.)

-
- 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)

-
2. Areas of approximate study (for example, Zone A's) where detailed re-studies should be considered:
-
-

3. Areas not mapped/no flood plain where approximate or detailed studies should be considered:

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.):

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

1. Availability of mapping at the town level:

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

- b. Topography (contour interval):

- c. Other:

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

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

4. Other comments:

5. Action Items:

Additional Notes:

Appendix D. Prioritized Flooding Sources

Appendix D. Prioritized flooding sources in Belknap 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
Belmont	330002	{9B65958A-C14F-46FA-B2CB-5B3A94824AB0}	Tioga River (1042832.44, 352600.55)	6/25/1976	A	37144.40	Detailed Study/Riverine	High	1	8	2	10	5	5	0	20	10	60
Belmont	330002	{929FFCBC-04BD-4BEA-84D5-9FDF034A3644}	Tioga River (1017564.09, 345591.22)	6/25/1976	A	4148.35	Detailed Study/Riverine	High	1	8	2	10	5	5	0	20	10	60
Belmont	330002	{3DF0E598-FECE-42B3-98ED-26FF6DCCC7B8}	Tioga River (1018603.53, 344857.05)	6/25/1976	A	1008.32	Detailed Study/Riverine	High	1	8	2	10	5	5	0	20	10	60
Belmont	330002	{416ED476-3FB6-45A0-86FB-117391027010}	Silver Lake (1018027.83, 349814.73)	6/25/1976	A	936.76	Detailed Study/Riverine	High	2	8	2	10	5	5	0	20	8	58
Belmont	330002	{49028A33-3D10-4A02-B777-75073B641AD7}	Silver Lake (1018000.05, 348936.66)	6/25/1976	A	3554.10	Detailed Study/Riverine	High	2	8	2	10	5	5	0	20	8	58
Meredith	330006	{7FFCF2EC-571D-4DBB-B302-BAD28B57679A}	Lake Waukewan (1020197.31, 423717.38)	6/3/1988	AE	10155.92	Detailed Study/Riverine	Medium High	1	8	4	6	5	5	5	15	10	58
Alton	330001	{E4969C97-D0BB-413E-92C4-F7ED78B26AAB}	Merrymeeting River (1099072.07, 354110.55)	5/17/1988	A	27485.15	Detailed Study/Riverine	Medium High	1	4	6	6	5	5	5	15	10	56
Belmont	330002	{0F8A159D-3AAA-46DD-A528-8FC625A63CCE}	Winnisquam Lake (1021816.02, 357564.34)	6/25/1976	A	1467.48	Detailed Study/Riverine	Medium High	3	8	2	10	5	5	0	15	6	51
Belmont	330002	{F5C4D03E-00C0-456A-AB27-63478AE2B90A}	Winnisquam Lake (1026956.89, 371744.63)	6/25/1976	A	15818.18	Detailed Study/Riverine	Medium High	3	8	2	10	5	5	0	15	6	51
Belmont	330002	{210D2907-8E31-41AC-9081-08065ABA6398}	Winnisquam Lake (1020451.28, 357730.53)	6/25/1976	A	2041.13	Detailed Study/Riverine	Medium High	3	8	2	10	5	5	0	15	6	51
Belmont	330002	{F5C4D03E-00C0-456A-AB27-63478AE2B90A}	Winnisquam Lake (1027653.65, 376719.27)	6/25/1976	A	5024.89	Detailed Study/Riverine	Medium High	3	8	2	10	5	5	0	15	6	51
Gilmanton	330208	{9E9D61F0-F292-4784-805D-329D48A5CF4C}	Nighthawk Hollow Brook (1075027.09, 333398.44)	9/21/1979	A	15621.65	Detailed Study/Riverine	Medium High	1	2	4	10	0	5	5	15	10	51
Meredith	330006	{4FF6FE19-B08F-41FF-BA32-9D8AD60A979E}	Hawkins Brook (1026426.32, 429691.68)	6/3/1988	A	10223.46	Detailed Study/Riverine	Medium High	2	8	4	6	5	5	0	15	8	51
Sanbornton	330008	{DCB273F5-C82B-42F8-B680-5E65808FB393}	Hermit Lake (997994.89, 390022.14)	6/15/1979	D	7542.29	Detailed Study/Riverine	Medium High	1	2	4	10	5	5	0	15	10	51
New Hampton	330007	{7FFCF2EC-571D-4DBB-B302-BAD28B57679A}	Lake Waukewan (1016386.45, 424580.10)	4/3/1986	A	3928.69	Detailed Study/Riverine	Medium High	2	2	4	6	5	5	5	15	8	50
Meredith	330006	{5EAC5176-9E74-4EFB-8F26-4CBB78EC91E7}	Wickwas Lake (1011800.93, 407581.46)	6/3/1988	A	8493.56	Detailed Study/Riverine	Medium	3	8	4	6	5	5	5	10	6	49
Meredith	330006	{5EAC5176-9E74-4EFB-8F26-4CBB78EC91E7}	Wickwas Lake (1012591.13, 409068.69)	6/3/1988	A	2728.75	Detailed Study/Riverine	Medium	3	8	4	6	5	5	5	10	6	49
Barnstead	330177	{0C200BF2-DDA0-48B3-B870-4B388838E2EC}	Big River (1093955.47, 304310.04)	4/2/1986	D	3847.95	Detailed Study/Riverine	Medium High	1	8	4	6	0	5	0	15	10	48
Belmont	330002	{3B38B671-7325-4A9A-8192-09FF39BA5CDA}	Silver Lake (1019669.68, 354535.65)	6/25/1976	A	5457.86	Detailed Study/Riverine	High	2	8	2	10	5	5	0	10	8	48
New Hampton	330007	{DCE66164-1FC8-42A1-BE56-682E2CC5DEE1}	Pemigewasset River (987455.31, 411234.89)	4/2/1986	A	27879.55	Detailed Study/Riverine	Medium High	1	2	4	6	5	5	0	15	10	47

Appendix D. Prioritized flooding sources in Belknap 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
New Hampton	330007	{CE80B0DB-E586-427F-B9FF-7B77A7278F73}	Pemigewasset River (987798.94, 413771.43)	4/2/1986	A	2331.43	Detailed Study/Riverine	Medium High	1	2	4	6	5	5	0	15	10	47
New Hampton	330007	{25F5B8CF-7277-4118-A9AB-7B233371926}	Pemigewasset River (986974.25, 411803.91)	4/2/1986	A	750.69	Detailed Study/Riverine	Medium High	1	2	4	6	5	5	0	15	10	47
New Hampton	330007	{F110AA16-E0DE-496A-AC71-BF2615198CBE}	Pemigewasset River (988905.12, 431284.35)	4/2/1986	A	7439.28	Detailed Study/Riverine	Medium High	1	2	4	6	5	5	0	15	10	47
New Hampton	330007	{63A8AC29-69C0-4D74-B79A-B9C359FBEC7E}	Pemigewasset River (988048.62, 424275.20)	4/2/1986	A	801.62	Detailed Study/Riverine	Medium High	1	2	4	6	5	5	0	15	10	47
New Hampton	330007	{F4AF7EEA-EBD3-42B1-A55A-537E8862886D}	Pemigewasset River (987333.62, 423392.47)	4/2/1986	A	10236.46	Detailed Study/Riverine	Medium High	1	2	4	6	5	5	0	15	10	47
New Hampton	330007	{839627A4-92D9-4738-8B36-B52878351C58}	Pemigewasset River (987491.36, 423704.15)	4/2/1986	A	343.88	Detailed Study/Riverine	Medium High	1	2	4	6	5	5	0	15	10	47
Barnstead	330177	{4F7A684B-48D3-42BE-8A91-D46F71E0588B}	Wheeler Brook (1081981.85, 306458.39)	4/2/1986	D	5164.42	Detailed Study/Riverine	Medium High	2	8	4	6	0	5	0	15	8	46
Laconia	330005	{3E129232-5076-4285-8446-A61338E4CED9}	Pickrel Cove Brook (1028490.06, 405509.85)	8/15/1980	D	2449.44	Detailed Study/Riverine	Medium High	1	8	0	8	0	5	0	15	10	46
Belmont	330002	{468FAEE2-3144-4DC9-BF9C-B06303768454}	Pumping Station Branch (1032608.35, 342583.40)	6/25/1976	A	2314.08	Detailed Study/Riverine	Medium High	4	8	2	10	5	0	0	15	4	44
Belmont	330002	{70AA5BC7-17F4-43AA-AC56-00C514AA3AD1}	Durgin Brook (1030472.14, 360341.08)	6/25/1976	A	5256.68	Detailed Study/Riverine	Medium High	5	8	2	10	5	0	0	15	4	44
Belmont	330002	{5A401F4C-AF0F-480F-AA86-02ABD039FC0E}	Unnamed (1024483.37, 355443.14)	6/25/1976	A	3284.21	Detailed Study/Riverine	Medium	7	8	2	10	5	5	0	10	4	44
Belmont	330002	{5A401F4C-AF0F-480F-AA86-02ABD039FC0E}	Unnamed (1024732.91, 356514.95)	6/26/1976	A	2295.99	Detailed Study/Riverine	Medium	8	8	2	10	5	5	0	10	4	44
Gilford	330004	{AFA79BDF-9761-425D-B17C-82C831A66A11}	Gunstock River (1054774.59, 391092.69)	5/4/1992	A	2037.16	Redelineation	Medium	1	8	2	4	0	5	5	10	10	44
Gilmanton	330208	{14122F93-121E-4C4D-A095-740881D0AC9E}	Suncook River (1081149.61, 335329.87)	9/21/1979	A	8443.80	Detailed Study/Riverine	Medium High	2	2	4	10	0	5	0	15	8	44
Sanbornton	330008	{DF7210EC-5164-4EFD-88DB-D73994B55325}	Salmon Brook (999999.38, 384656.57)	6/15/1979	D	13684.79	Detailed Study/Riverine	Medium High	2	2	4	10	0	5	0	15	8	44
New Hampton	330007	{95D20AFF-7CE8-4160-BF17-C5E37C83CDBB}	Pemigewasset Lake (1002507.97, 406012.38)	4/2/1986	A	5397.43	Detailed Study/Riverine	Medium High	3	2	4	6	5	5	0	15	6	43
Sanbornton	330008	{EAD94021-6BC0-404A-8399-C92A0E04C507}	Salmon Brook (996350.24, 392444.93)	6/15/1979	D	3413.21	Detailed Study/Riverine	Medium High	3	2	4	10	0	5	0	15	6	42
New Hampton	330007	{F31823D3-2803-41A1-8096-C097FC68B0C1}	Harper Brook (990421.02, 411867.74)	4/2/1986	A	4673.87	Detailed Study/Riverine	Medium High	4	2	4	6	5	5	0	15	4	41
Sanbornton	330008	{72D9CC58-44BB-446A-AFFC-A2651A577A9D}	Unnamed (999285.60, 391611.01)	6/15/1979	D	2706.36	Detailed Study/Riverine	Medium High	4	2	4	10	0	5	0	15	4	40
Sanbornton	330008	{C6A100A4-85E9-4653-A1E6-0C212534E2A3}	Patterson Brook (1016180.30, 368673.09)	6/15/1979	D	5070.56	Detailed Study/Riverine	Medium High	5	2	4	10	0	5	0	15	4	40

Appendix D. Prioritized flooding sources in Belknap 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
Sanbornton	330008	{B72B6F77-B95B-42B6-BFF9-F06A94F359F9}	Wallis Brook (1018363.20, 368292.93)	6/15/1979	D	3207.53	Detailed Study/Riverine	Medium High	6	2	4	10	0	5	0	15	4	40
Sanbornton	330008	{80C179A0-7301-4AE0-8942-055166CFECAE}	Threshing Mill Brook (998933.01, 362031.23)	6/15/1979	D	8080.35	Detailed Study/Riverine	Medium	7	2	4	10	5	5	0	10	4	40
Belmont	330002	{1D2C040B-AFB7-414F-9D7D-08C4AAD2E8CF}	Sargent Lake (1045499.70, 344412.77)	6/25/1976	A	2307.53	Detailed Study/Riverine	Medium	6	8	2	10	0	5	0	10	4	39
Meredith	330006	{0C49E6C1-002E-42A0-AE63-0381FFDFAEE2}	Collins Brook (1019978.63, 402129.25)	6/3/1988	A	5707.13	Detailed Study/Riverine	Medium	6	8	4	6	0	5	0	10	4	37
New Hampton	330007	{4BE933EC-7732-4F4F-904F-B62489141151}	Ames Brook (1000820.93, 429657.35)	4/2/1986	A	7903.65	Detailed Study/Riverine	Medium High	5	2	4	6	0	5	0	15	4	36
New Hampton	330007	{488A9D3D-1563-4C73-93BF-3EEDF289CF95}	Winona Lake (1009445.51, 430474.07)	4/2/1986	A	3366.59	Redelineation	Medium	6	2	4	6	5	5	0	10	4	36
New Hampton	330007	{48EA7EED-B6E9-43E7-AD41-3250324CD53E}	Magoon Brook (992698.51, 408035.75)	4/2/1986	A	5941.83	Detailed Study/Riverine	Medium	7	2	4	6	5	5	0	10	4	36
Tilton	330009	{757E10D4-2C6D-4AC4-9718-2B5667E3D41B}	Packer Brook (1003891.25, 344576.92)	8/19/1997	AE	846.63	Redelineation	Medium	1	8	1	2	0	5	0	10	10	36
Sanbornton	330008	{B72B6F77-B95B-42B6-BFF9-F06A94F359F9}	Wallis Brook (1019575.07, 365883.43)	6/15/1979	D	323.90	Detailed Study/Riverine	Medium	4	2	4	10	0	5	0	10	4	35
Sanbornton	330008	{B72B6F77-B95B-42B6-BFF9-F06A94F359F9}	Wallis Brook (1019537.24, 365888.32)	6/15/1979	D	38.14	Detailed Study/Riverine	Medium	4	2	4	10	0	5	0	10	4	35
Sanbornton	330008	{C54F001F-3924-47D1-81C1-CBE341D62583}	Chapman Brook (1019454.31, 365684.26)	6/15/1979	D	524.34	Detailed Study/Riverine	Medium	5	2	4	10	0	5	0	10	4	35
Belmont	330002	{602F59EA-F8F8-49CB-A1D6-CB9D65162753}	Unnamed (1033126.57, 350137.66)	6/25/1976	A	2146.73	Detailed Study/Riverine	Medium	9	8	2	10	0	0	0	10	4	34
Belmont	330002	{F8033E3A-CA21-4803-A595-77D3670C62DD}	Unnamed (1028535.99, 349407.67)	6/25/1976	A	2115.93	Detailed Study/Riverine	Medium	10	8	2	10	0	0	0	10	4	34
Gilmanton	330208	{E08EE26D-A0F2-46B7-B2F1-0A4FBF42EC49}	Ayers Branch (1075066.58, 328110.15)	9/21/1979	A	6170.71	Detailed Study/Riverine	Medium	3	2	4	10	0	0	0	10	6	32
Meredith	330006	{42B6D8E4-646D-42B6-B013-0DF86C42E31D}	Swains Pond (1014369.74, 397342.63)	6/3/1988	A	4197.16	Detailed Study/Riverine	Medium	4	8	4	6	0	0	0	10	4	32
Meredith	330006	{C7429F58-8BE6-483F-8864-668DAE788F7C}	Unnamed (1016206.90, 417869.06)	6/3/1988	A	2090.65	Detailed Study/Riverine	Medium	7	8	4	6	0	0	0	10	4	32
Meredith	330006	{8BB31B93-FF28-4EEA-9B43-8B430DE880B4}	Mill Brook (1019978.63, 402129.25)	6/3/1988	A	7375.01	Detailed Study/Riverine	Medium	5	2	4	6	0	5	0	10	4	31
New Hampton	330007	{F31823D3-2803-41A1-8096-C097FC68B0C1}	Harper Brook (994536.43, 411035.11)	4/2/1986	A	5893.05	Redelineation	Medium	8	2	4	6	5	0	0	10	4	31
New Hampton	330007	{63F8483B-34CC-47A2-8977-19EDF5E86F35}	Blake Brook (974598.18, 393934.91)	4/2/1986	A	4016.15	Detailed Study/Riverine	Medium	9	2	4	6	0	5	0	10	4	31
Sanbornton	330008	{0E8ABF9A-C9C3-42C4-AA29-8B505C1B877F}	Unnamed (1017439.82, 380391.98)	6/15/1979	D	3725.51	Detailed Study/Riverine	Medium	8	2	4	10	0	0	0	10	4	30
New Hampton	330007	{562FCC04-B5B9-4DB8-ADE0-57FF07D5D9C0}	Unnamed (987538.54, 402428.62)	4/2/1986	A	3368.20	Detailed Study/Riverine	Medium	10	2	4	6	0	0	0	10	4	26
New Hampton	330007	{639802AA-D7AE-4EC3-8FF4-96ED176FE564}	Snake River (1012148.59, 426910.00)	4/2/1986	A	5652.33	Detailed Study/Riverine	Medium Low	10	2	4	6	5	0	0	5	4	26
New Hampton	330007	{27D435C5-6033-4A15-B67F-0C7215F60514}	Forest Pond (1012538.35, 416216.26)	4/2/1986	A	1127.14	Detailed Study/Riverine	Medium Low	10	2	4	6	0	5	0	5	4	26

