100-Year Floodplains in the Lamprey River Watershed: Flood Insurance Rate Maps (FIRMs), 2100 LID Buildout, and 2100 Conventional Buildout

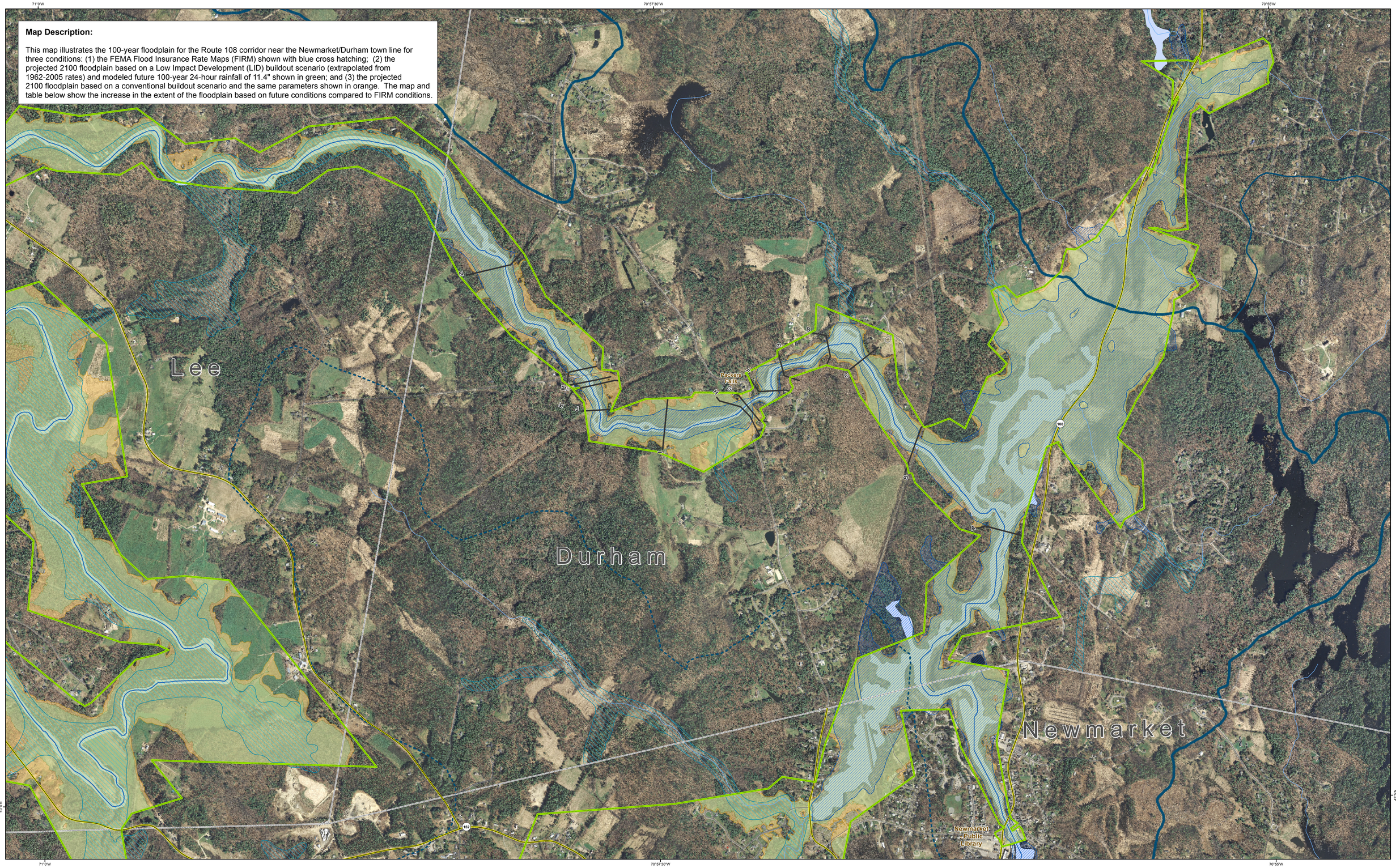
Durham/Route 108 Corridor Panel

University of New Hampshire

71°0'0"W 70°57'30"W 70°55'0"W

Map Description:

This map illustrates the 100-year floodplain for the Route 108 corridor near the Newmarket/Durham town line for three conditions: (1) the FEMA Flood Insurance Rate Maps (FIRM) shown with blue cross hatching; (2) the projected 2100 floodplain based on a Low Impact Development (LID) buildout scenario (extrapolated from 1962-2005 rates) and modeled future 100-year 24-hour rainfall of 11.4" shown in green; and (3) the projected 2100 floodplain based on a conventional buildout scenario and the same parameters shown in orange. The map and table below show the increase in the extent of the floodplain based on future conditions compared to FIRM conditions.



Map Key:

- 2100 100-Year Floodplains: LID Buildout
- 2100 100-Year Floodplains: Conventional Buildout
- Effective Zone AE 100-Year Floodplains: Special Flood Hazard Areas with Base Flood Elevations (BFEs) determined
- Effective Zone A 100-Year Floodplains: Special Flood Hazard Areas with no Base Flood Elevations (BFEs) determined
- A — Effective Cross Sections
- Limits of Inundation Mapping
- Lamprey River Watershed Boundary
- Subwatershed Boundaries
- Lamprey River
- River and Stream Networks
- Town/County Bounds
- State roads
- Local roads

Figures showing the surface water elevations and water discharge at each cross section for each scenario can be viewed in a separate document available on the project web site: http://100yearfloods.org

Acreage Summary:

Town	Total Acreage in Watershed	Acreage within Area Mapped	100-Year Floodplains: Inundation Acreage within Area Mapped: FIRM 2005	Updated (2005) Conditions (based on 8.5" rainfall)	2100 Buildout (based on 11.4" rainfall): Conventional	2100 Buildout (based on 11.4" rainfall): LID	Residential/Commercial/Industrial Land Use: Total Acreage in Watershed: Updated (2005) Conditions	2100 Buildout Conditions
Barrington	4,344	0	---	---	---	---	332	1,877
Brentwood	812	0	---	---	---	---	100	504
Candia	11,917	16	6	8	11	8	1,237	7,845
Deerfield	26,755	9	1	3	3	3	1,657	13,297
Durham*	4,984	802	499	567	625	567	667	2,160
Epping	16,752	2,495	899	923	1,026	923	2,082	10,523
Exeter	1,546	0	---	---	---	---	120	529
Fremont	2,999	7	---	---	---	---	531	1,951
Lee	7,927	1,217	551	756	916	756	1,311	4,458
Newfields	2,612	50	28	24	26	24	329	1,204
Newmarket	6,559	1,904	450	641	741	641	1,701	4,203
Northwood	7,549	0	---	---	---	---	621	4,998
Nottingham	30,681	0	---	---	---	---	2,109	12,691
Raymond	12,277	2,324	874	985	1,113	985	2,164	7,585
Strafford	29	0	---	---	---	---	3	15
Total Watershed*	**137,743**	**8,822**	**3,309**	**3,907**	**4,461**	**3,907**	**14,965**	**73,838**

* Table includes acreage of flooding in bypass over the Oyster River in Durham.

Technical Notes:

The updated and projected floodplains were modeled using FEMA approved methodologies (watershed hydrology using the US Army Corps of Engineers [USACE] Hydrologic Engineering Center Hydrologic Modeling System [HEC-HMS]; hydraulic analysis using the USACE Hydrologic Engineering Center River Analysis System [HEC-RAS]). The hydraulic model included 262 river cross sections: 115 sections from the original FIS dataset, 46 sections from recent field survey and other analyses, 101 additional sections and extended embankment elevations generated from 2011 LiDAR imagery (2-meter digital elevation model, 15-cm vertical root mean square error). Reaches without surveyed cross-sections (Piscassic River and Moonlight Brook) used topography generated by LiDAR, and assumed channel geometry.

The 100-year 24-hour rainfall depth for the period: (1) from 1938-2010 (8.5") derived from the Northeast Regional Climate Center (http://www.precip.net); (2) up to 2100 (11.4") derived from the largest 24-hour rainfall event from downscaled model output from four global climate models.

Future land use extrapolated from 1962-2005 historical buildout rates, current zoning, and Conventional or Low Impact Development.

The effective FIRM base flood elevations based on NAVD29 datum; the 2005, 2050, and 2100 base flood elevations based on the NAVD88 datum.

While this map is not a legally binding document, federal and state guidance encourages the use of the most current information available to support community-based planning and zoning. A detailed analysis of legal issues associated with using this map (or others in this series), written by the Vermont Law School, is available at the project web sites listed below. Legal FEMA effective Flood Insurance Rate Maps (FIRMs) maps are available online at: http://www.granit.unh.edu/dfirms

More project information and maps are available at: http://www.granit.unh.edu/MapLibrary/ProjectMaps or http://100yearfloods.org Detailed methodology is also described in: Scholz, A. 2011. Consequences of Changing Climate and Land Use to 100-Year Flooding in the Lamprey River Watershed of New Hampshire. MS Civil Engineering, University of New Hampshire, Durham, NH.

Map Data Sources:

Updated 100-year floodplains: Data from NOAA/CICEET funded proposal "Assessing the Risk of 100-year Freshwater Floods in the Lamprey River Watershed of New Hampshire Resulting from Changes in Climate and Land Use", C. Wake, Principal Investigator.

Effective Zones/Special Flood Hazard Areas: Effective DFIRM panels for Rockingham and Strafford Counties, May 17, 2005.

Surface Water: NH National Hydrography Dataset, April 2007.

Watersheds: NH Department of Environmental Services, September 2002.

Topography: National Elevation Dataset, 10-meter resolution Digital Elevation Model.

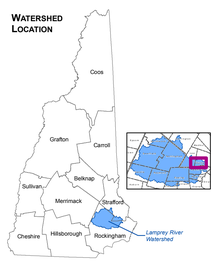
Transportation: NH Department of Transportation, April, 2010.

Photography: 1-foot resolution aerial photography, Spring, 2010.

Miles
0 0.05 0.1 0.2 0.3

Scale: 1:7,200
(1 inch to 600 ft.)

Watershed Location



Assessing Flood Risk in the Lamprey River Watershed

Support for this project was provided by the Cooperative Institute for Coastal and Estuarine Environmental Technologies (CICEET).

Map produced May, 2012

For further information about this project, please visit http://100yearfloods.org