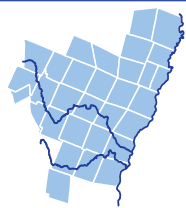


LIVING WITH INADEQUATE MAPS



Floodplain Maps - The Basics

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP), which manages the mapping of the nation's floodplains and makes federally-supported flood insurance available in participating communities. Flood Insurance Rate Maps (FIRMs) are used by the insurance industry to rate flood policies according to the flood risk of the property to be insured. Lenders generally require flood insurance be obtained for property located in a mapped “special flood hazard area.” Local planners also rely on FIRMs in the development planning and permitting processes to support safer development and help property owners make informed decisions regarding their flood risk.

FEMA is currently updating flood risk maps through the Map Modernization initiative. Digital Flood Insurance Rate Maps (DFIRMs) are the resulting map products of this effort. DFIRMs can be distributed electronically, added to existing base maps, or printed in traditional hard copy format. They have aerial photography as a background so that designated flood hazard areas can now be easily seen against recognizable landmarks. As is the case with the old Flood Insurance Rate Maps, these new DFIRMS are used to regulate development, and to establish flood risk zones and base flood elevations to mitigate against potential future flood damages to property. They are precise, but their accuracy may be an illusion.

Conventional wisdom suggests that modern maps are accurate. However, maps, even computer generated maps, are only as accurate as the data that created them. In the case of floodplain maps, representations of risk may be products of highly-detailed hydrologic and hydraulic modeling laid onto excellent topographic surveys, or instead may be best estimates based on historical flood records placed as best as possible on 20-foot contour data.

The level of detail and cost that goes into a study determines the level of detailed information available on the maps. FEMA’s Map Modernization initiative invests resources based on the density of property at risk of flooding. Higher population areas are mapped to the greatest level of detail, whereas rural, sparsely populated areas (like most of Vermont) are mapped with less detail. Most FIRMs in Vermont are a decade or two old and are not likely to get new flood studies during the conversion to DFIRMS. Communities should closely examine draft DFIRMS when they become available to ensure that any errors are corrected.

Uses and Limitations of FEMA Floodplain Maps

Floodplain maps are administrative tools which usually depict floodplain and floodway areas expected to be inundated in the “100-year” flood, and the minimum elevations for development and floodproofing to avoid flood damage. In the least studied areas, there may not even be designated floodways or flood heights. This presents challenges for local floodplain managers, who may seek to require developers and property owners to conduct engineering studies to accurately assess flood risk on a given piece of property to ensure that development will be safe from flooding.

Local development standards in ordinances or regulations refer to the FIRM, or new DFIRM, for regulating types of development appropriate to a given area based on its risk of flooding. Yet, floodplain maps do not provide information on site-specific flood hazards, such as land erosion or sudden shifts in the channel of the watercourse. Also, roads, or other barriers can restrict water flow and affect local flood levels.

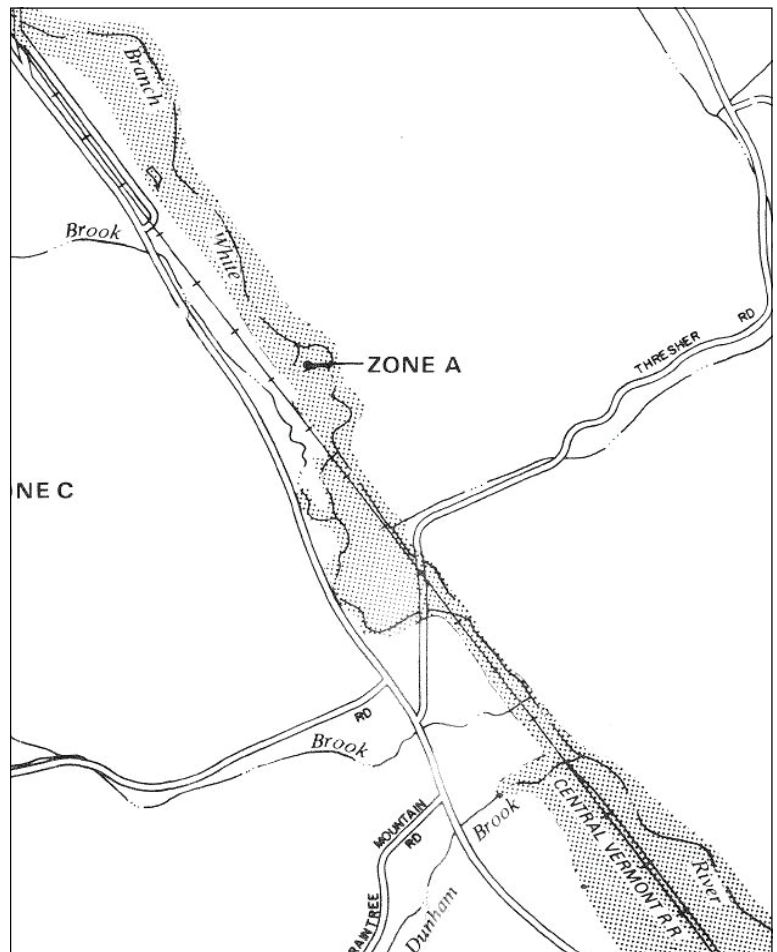


Ice jams on the Ottawaquechee River, Woodstock, 2007

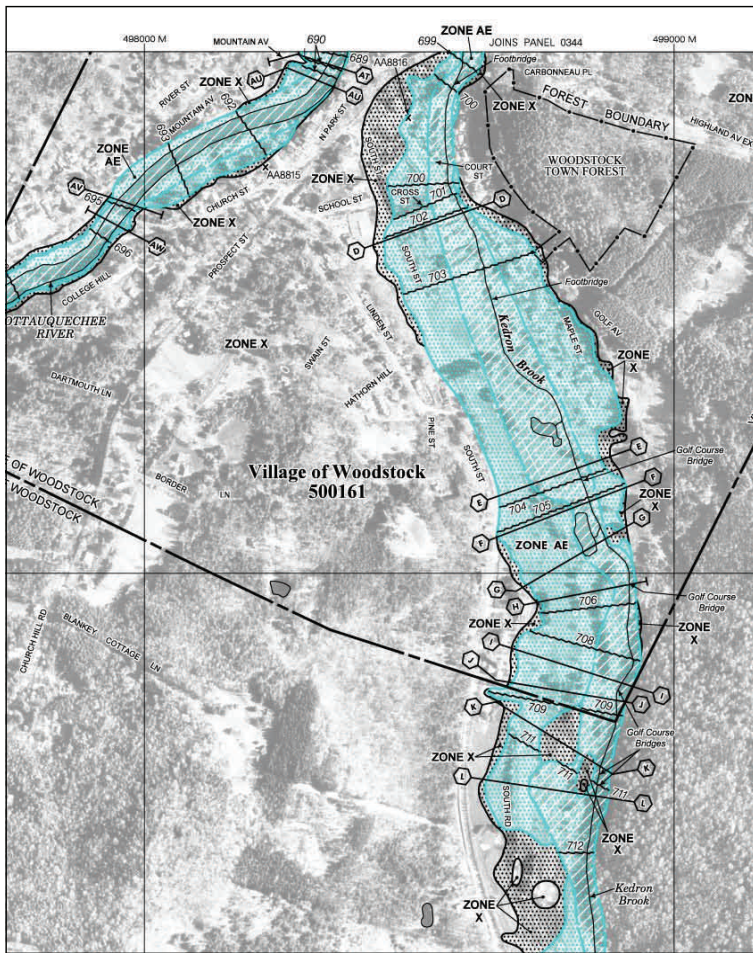
Additionally, obstructions such as ice, debris, flooding in surrounding areas, groundwater or other phenomena can cause flood levels to exceed those indicated on the map. Land adjacent to a floodplain may be subject to flooding from tributary watercourses, many of which were not studied for flood risks because they were small.

Floodplain maps do not locate legal survey boundaries. A site survey is required to reconcile the property location, ground elevations, and designated flood level information.

This old FIRM map shows an “unnumbered A zone” resulting from only a limited flood study. There are no established Base Flood Elevations or floodways. Applicants will have to pay to develop this data before their permit can be reviewed.



Old FIRM Map of Braintree, drafted 1985



New FIRM Map of Woodstock, 2007

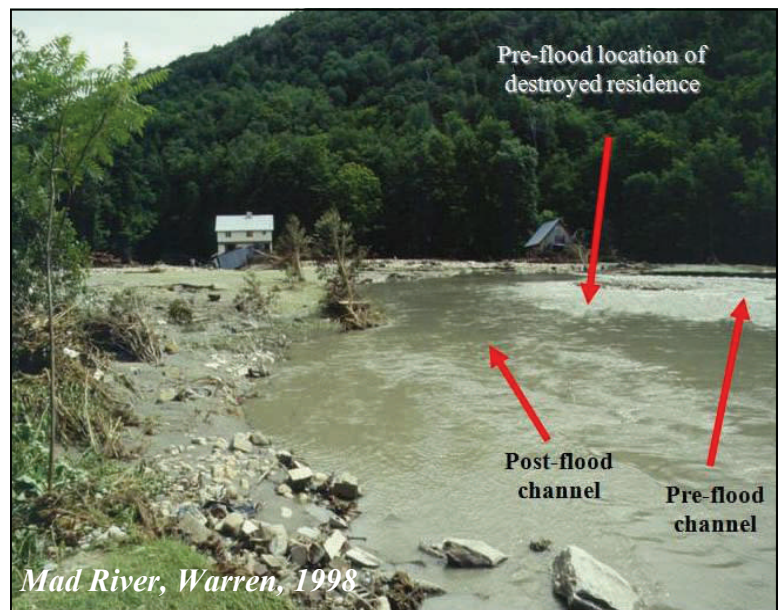
Improving Flood Maps

Communities must regulate at least the mapped areas on FIRMs, but they can go beyond these areas. Some towns in Vermont, in concert with their regional planning commission and the Vermont River Management Program are mapping the dangers of rivers and streams eroding sideways. This is known as fluvial erosion hazard (FEH) mapping. FEH maps can then be used in addition to FIRMs to more fully recognize flood dangers.

Since the creation of FEH maps is a time-consuming process, towns can also use the Vermont Agency of Natural Resources buffer guideline and keep development back fifty feet from the top of streambanks. This simple step can help preclude unwise development until

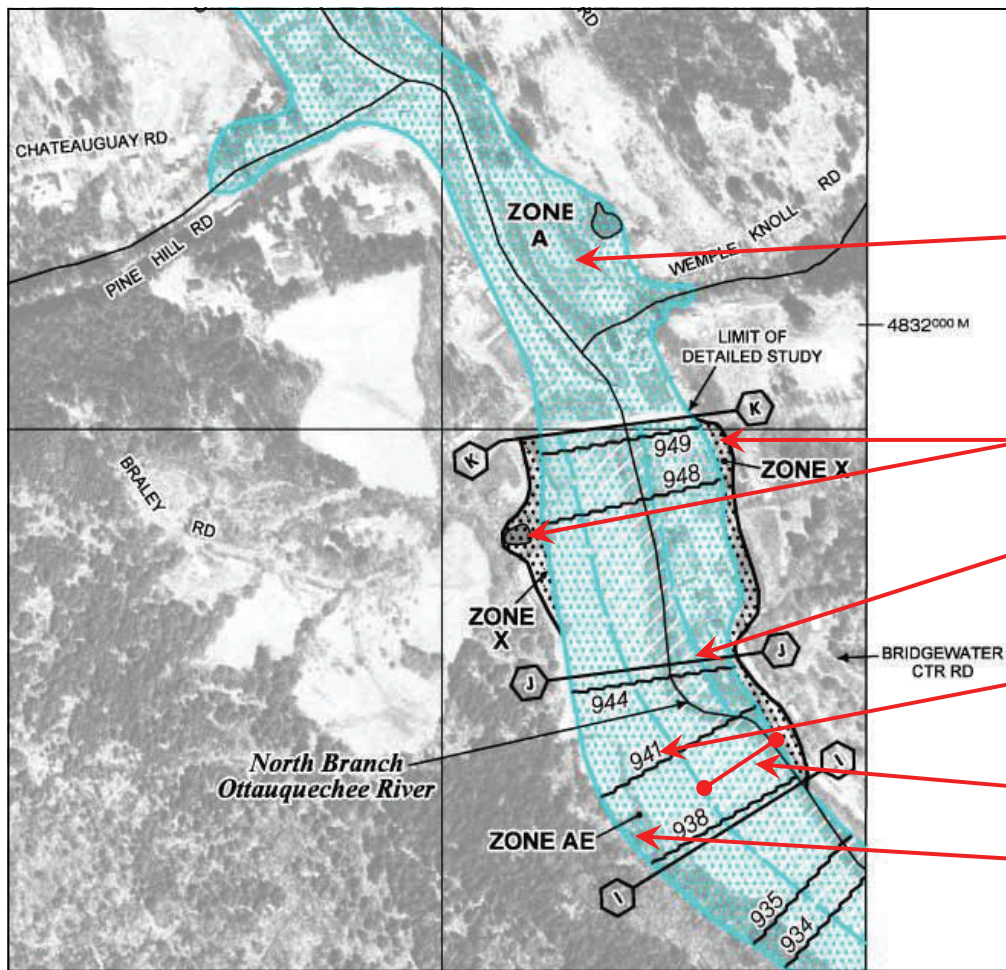
mapping is improved.

Communities can slowly acquire better contour data for their valley floors, and then provide this to FEMA for use in map updates. Landowners can improve FEMA's maps piecemeal by filing what are known as Letters of Map Amendment (LOMAs). This process uses site surveys to correct instances of errors that are usually due to inaccurate topographical data. Eventually these corrections are all recorded on revised maps.



Courtesy of VTDEC River Management Program

The photo above shows how dramatically a channel can shift in a single flood. Flood maps show the channel as it was when the flood study was done, and may not represent the actual channel's location any longer.



100 year — 1% annual risk
500 year — 0.2% annual risk

Zone A: Areas of 100 year floodplain, with no flood elevations or floodway determined.

Zone X: Areas of 500 year floodplain if shaded, low flood risk if not shaded.

Cross section of floodplain.

Base Flood Elevation in feet above sea level.

Floodway

Zone AE: Areas of 100 year floodplain with flood heights BFE (base flood elevation).

Anatomy of the information on a DFIRM map.

Additional fact sheets include:

- #1 Floodplain Basics
- #2 Protecting Property Rights to Reduce Local Liability
- #4 Using Freeboard and Setbacks to Reduce Flood Damage
- #5 No Adverse Impact Floodplain Management
- #6 Protecting Lives & Property Through the NFIP Community Rating System.

For more information, contact:

VTDEC River Management Program

www.vtwaterquality.org/rivers/htm/rv_floodhazard.htm

Vermont Law School's Land Use Institute

<http://www.vermontlaw.edu/elc/landuse/>

Two Rivers-Ottawquechee Regional Commission

www.trorc.org

Produced by the Two Rivers-Ottawquechee Regional Commission in cooperation with Vermont Law School's Land Use Institute, and the Vermont Department of Environmental Conservation, with Samantha Riley Medlock, CFM V.L.S. '08, as principal author. This paper is a general discussion of legal issues but is not legal advice, which can only be provided by an attorney licensed to practice in Vermont.