

# FLOODPLAIN BASICS

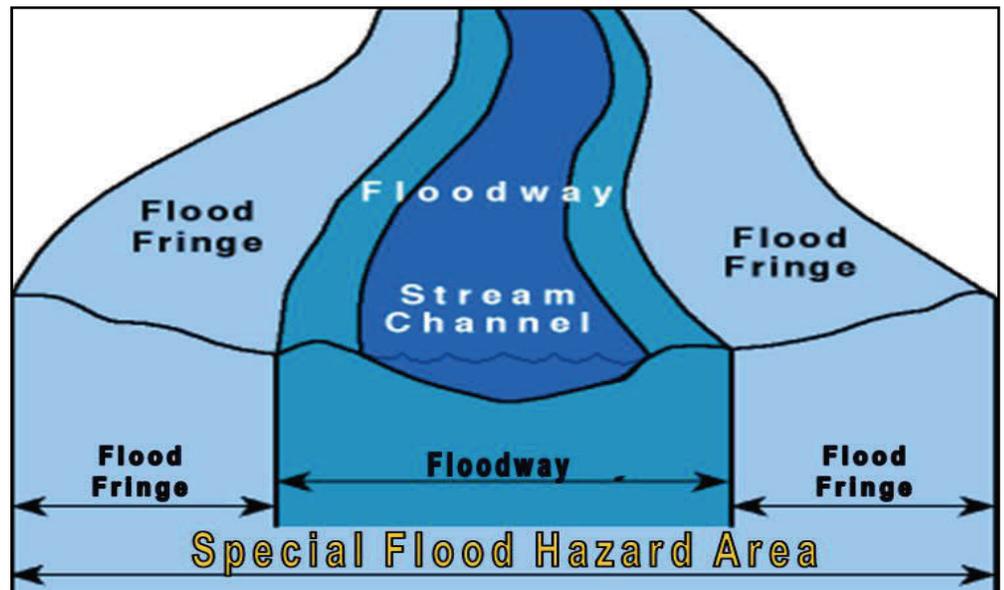


Floods have shaped the natural landscape since the beginning of time and will continue to do so. The most frequent cause of flooding is heavy rains, but flooding can also result from melting snow, ice jams or dam failures. Floods and flash floods can occur at any time of year. Floods only came to be disasters that threatened lives and property when humans settled in flood-prone areas. Today, more than 20,000 U.S. communities contain areas subject to a substantial flood risk, many of which have been recognized as floodplains and mapped under the National Flood Insurance Program.

## What is a Floodplain Anyway?

A floodplain is the comparatively low-lying land adjacent to a waterway, and is generally defined according to its frequency of flooding. For example, the “100-year floodplain” is that area subject to inundation in the “100-year flood”, or, more accurately stated, a flood that has a 1%-chance of occurring in any given year. Some Vermont towns have had two 100-year floods in the same decade!

**Standard homeowner insurance does NOT cover flood damage.**



*Courtesy of VTDEC River Management Program*

Statistically, a homeowner in the 100-year floodplain has a 26% chance of being flooded during the life of a 30-year mortgage, and many owners are unaware that standard homeowner's insurance does NOT cover damages from a flood. That is why lenders generally require property in the floodplain to carry flood insurance. However, floods rarely follow the precise boundaries on a map, especially flash floods associated with sudden, heavy downpours. Flood damages can and often do occur outside the limits of the regulatory floodplain. Nationally, approximately one-third of all flood damages occur outside the mapped floodplain. In Vermont, two-thirds of flood damages occur outside of federally mapped flood areas.

# National Flood Insurance Program (NFIP)

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program, which manages the mapping of the nation's floodplains and makes federally-subsidized flood insurance available in participating communities.

Although the federal government administers the NFIP and assists communities with large-scale mitigation projects, community participation in the program is voluntary and land use decisions are made at the local government level. Within minimum guidelines, these decisions include whether and how to permit development, plan for local infrastructure, and administer permit programs.

**Community participation in the National Flood Insurance Program (NFIP) is the best first step to preparing your community for the next flood — before it strikes!**

In an identified flood-prone community that chooses not to participate in the NFIP, flood insurance and federal financial assistance are not available under the NFIP to mitigate flood damages. Additionally, if a Presidential disaster declaration occurs in a non-participating community, no federal financial assistance can be provided to assist with flood recovery.

**Participating communities can take charge of their floodplains by steering development out of harm's way.**

# Common Myths & Misconceptions about Flood Insurance

**Myth:** Only homeowners can purchase flood insurance.

**FACT:** Most homeowners, condo unit owners, renters, and businesses in NFIP participating communities can purchase flood insurance.

The maximum coverage amounts are:

- ◆ Homeowners and condo unit owners: up to \$250,000 in structural coverage and up to \$100,000 in contents coverage;
- ◆ Renters: up to \$100,000 in contents coverage;
- ◆ Businesses: up to \$500,000 in commercial structural coverage and up to \$500,000 in contents coverage.

**Myth:** You can't buy flood insurance if you are located in a high flood risk area.

**FACT:** You can buy National Flood Insurance no matter where you live, as long as your community participates in the NFIP.

**Myth:** If you live in a low-flood-risk area, you don't need flood insurance.

**FACT:** All areas are susceptible to flooding, although to varying degrees. If you live in a low-to-moderate flood risk area, it is advisable to have flood insurance. Residential and commercial property owners located in low-to-moderate risk areas should ask their agents if they are eligible for the Preferred Risk Policy, which provides very inexpensive flood insurance protection.

**Myth:** You can't buy flood insurance if your property has been flooded before.

**FACT:** You are still eligible to purchase a flood insurance policy after your home, condo, apartment, or business has been flooded, provided that your community is participating in the NFIP.

**Myth:** Homeowners insurance policies cover flooding.

**FACT:** Unfortunately, many home and business owners do not find out until it is too late that their homeowners and business insurance policies do not cover flooding.

**Myth:** Federal disaster assistance will pay for flood damage.

**FACT:** Before a community is eligible for disaster assistance, it must be declared a federal disaster area. Federal disaster assistance declarations are issued in less than 50 percent of flooding events. Furthermore, if you are uninsured and receive federal disaster assistance after a flood, you must purchase flood insurance to remain eligible for future disaster relief.

**Myth:** National Flood Insurance can only be purchased through the NFIP directly.

**FACT:** NFIP flood insurance is sold through private insurance companies and agents, and is backed by the Federal government.

**Myth:** The NFIP does not offer basement coverage.

**FACT:** While basement improvements such as finished walls and floors, and personal belongings in a basement are not covered by flood insurance, structural elements and essential equipment within a basement are.

*Information provided above is excerpted from [www.floodsmart.gov](http://www.floodsmart.gov). More information on flood insurance is available at [www.floodsmart.gov](http://www.floodsmart.gov), or by calling toll-free 1-888-275-6347 or TTY 1-800-427-5593 for the speech and hearing impaired.*



## Understanding Flood Insurance Requirements

When folks purchase a new house with a mortgage, banks will verify if a home is near or in the flood hazard area. In order to protect their mortgage from a loss, banks will require the homeowner to purchase federal flood insurance if the home is near or in the hazard area. Banks hire a private flood determination firm to determine the location of the home in relation of the flood hazard area.

This determination is based on federal flood data which may not accurately portray flood risk in Vermont's varied terrain. Many home buyers are told by their lenders that they need to purchase flood insurance because they are in the flood hazard area, when they may only be adjacent to this area.

If a homebuyer's bank has determined that a property requires flood insurance, they must complete a Letter of Map Change (LOMC) to opt out of flood insurance or qualify for a lower rate. For more information about how to get a LOMC, go to:

<http://www.fema.gov/hazard/map/lomc.shtm>

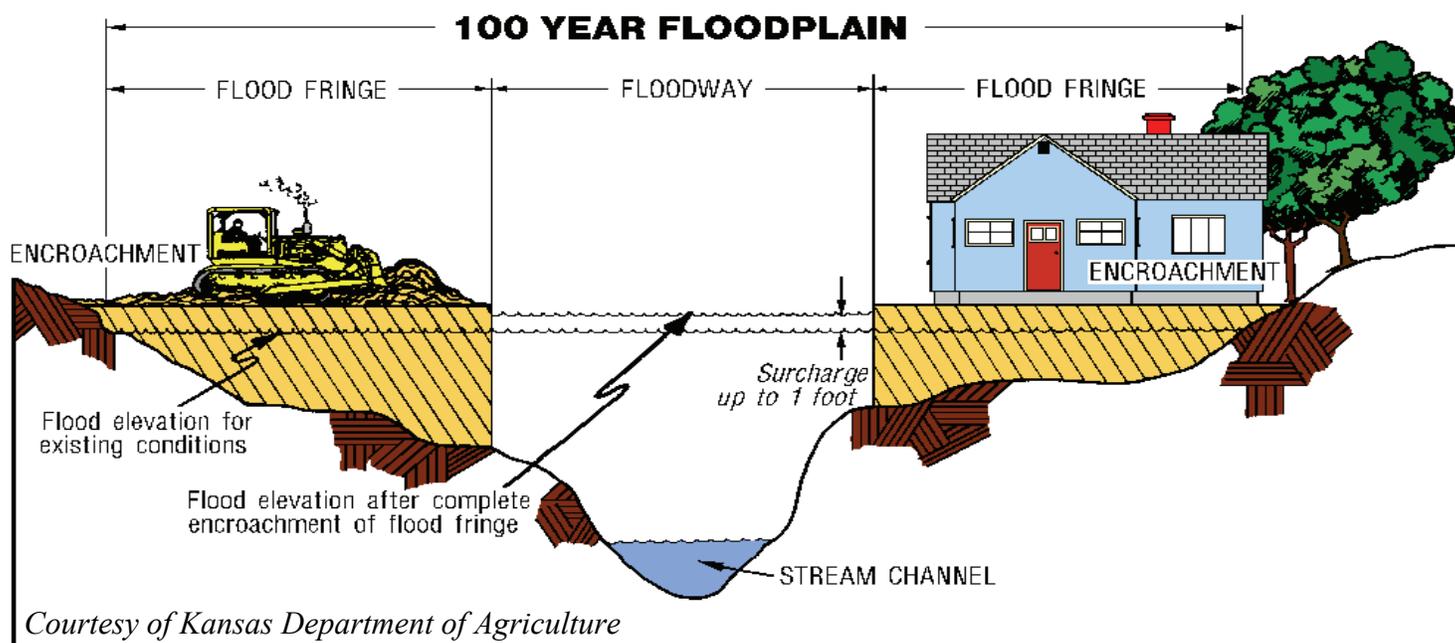
A LOMC states that their structure is above the base flood elevation listed on the flood maps and is certified by an engineer or surveyor. These can cost about \$500 to \$1000 and are available from your local surveyor or engineer. First American Flood Data Services (the largest flood determination firm) offers completed LOMC application for \$500 or \$925 if the property has significant fill.

[http://www.floodinfo.com/map\\_change/cost.php](http://www.floodinfo.com/map_change/cost.php)

# Know Your Local Flood Risk!

As a local official, you may have to deal with the consequences of past decisions. Even if your town is small and little growth is heading your way, existing homes and businesses may have been placed at risk. Local regulations may be outdated and not truly protective of property. Poor enforcement of existing flood hazard regulations may be increasing properties at risk.

It is important that communities review FEMA's flood maps as well as any history of flooding in town to fully comprehend the risks they face. Communities should also review their own regulations and their administration to ensure they are protecting their citizens. Many communities allow filling in of floodplains, as shown in the diagram, without understanding the increased threat of flooding this can cause. Planning for flood protection should also include mitigation plans to lessen the exposure to flood damages, and emergency plans to deal with evacuation and warning in higher risk communities.



## Additional fact sheets include:

- #2 Protecting Property Rights to Reduce Local Liability
- #3 Living with Inadequate Maps
- #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:

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[www.vtwaterquality.org/rivers/htm/rv\\_floodhazard.htm](http://www.vtwaterquality.org/rivers/htm/rv_floodhazard.htm)
- Vermont Law School's Land Use Institute**  
<http://www.vermontlaw.edu/elc/landuse/>
- Two Rivers-Ottawaquechee Regional Commission**  
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*Produced by the Two Rivers-Ottawaquechee 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.*

# PROTECTING PROPERTY RIGHTS TO REDUCE LIABILITY



Local boards and officials who act to protect their communities from flood hazards may face two types of legal challenges. An owner of land in a floodplain may challenge zoning or other regulations limiting the use of that land as an unconstitutional “taking.” Other land owners, whose property has been damaged by flooding, may claim that the municipality is liable for the damage because it was caused by municipal action or inaction. Careful local planning and regulation is the best defense to either challenge.



Courtesy of [www.archives.com](http://www.archives.com)

## The “Takings” Clause

The Fifth Amendment to the United States Constitution guarantees that private property shall not be taken by the federal or a state or local government for public use without just compensation (the “Takings Clause”). Chapter I, Article 2, of the Vermont Constitution provides a similar protection. In deciding cases under either Constitution, the Vermont Supreme Court looks to the U.S. Supreme Court’s Fifth Amendment decisions. See *Chioffi v. City of Winooski*, 165 Vt. 37, 676 A.2d 786 (1996) (U.S. Constitution) and *Killington, Ltd., v. State*, 164 Vt. 253, 668 A.2d 1278 (1995) (Vermont Constitution).

Regulations that “take” *some* of what citizens think are their property rights are often derided as being unconstitutional “takings”. Many attempts at even mild land use regulation run aground against angry landowners or developers arguing that they have an absolute, constitutional right to build on property. But, while claims like this may sound scary to volunteer local officials, there is no such absolute constitutional right.

## What is a Taking?

**Eminent Domain.** In the classic Takings Clause case, the government condemns and takes title to property for a public use by eminent domain under a law that provides a method of determining the compensation to be paid. For example, under 10 V.S.A. §§ 958-959, the Vermont Department of Environmental Conservation may use eminent domain proceedings to take land necessary for a flood control project.

# What is a Taking? (cont'd)

Regulatory Takings. Courts also recognize that a regulation that doesn't involve eminent domain proceedings may have such a significant effect on property that it is a taking under the Fifth Amendment. The landowner may be compensated for such a "regulatory taking" by bringing a court action for "inverse condemnation." In the recent case of *Lingle v. Chevron*, 544 U.S. 528 (2005), the United States Supreme Court significantly narrowed the opportunity for regulatory takings challenges, saying that a regulatory taking would be found only when the effect on the property owner was the "functional equivalent" of the actual taking of title by eminent domain.



Courtesy of [www.supremecourtus.gov](http://www.supremecourtus.gov)

The Court defined four categories of regulatory takings as identified in its prior decisions:

**1. Government has physically occupied the property permanently** (*Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419 (1982)). For example, a municipal activity diverting water that floods private land. See *Sargent v. Town of Cornwall*, 130 Vt. 323, 292 A.2d 818 (1972) (diversion of natural stream by clogged culvert).

**2. Government regulation or action has denied all economically viable use of the property** (*Lucas v. South Carolina Coastal Council*, 505 U.S. 1003 (1992)). For example, regulations denying the right to build or conduct any activity in a flood plain. The landowner must prove that there is no alternative use that would preserve some value for the land. Courts have found various alternative uses that sustain floodplain regulation. See *Gove v. Zoning Board of Appeals*, 444 Mass. 754, 831 N.E.2d 865 (2005) (open space). Moreover, under *Lucas* even where regulation deprives land of all economically beneficial use, no compensation may be due if the purpose is to prevent a dangerous use. See *Mansoldo v. New Jersey*, 187 N.J. 50 (2006).

**3. Government action has a significant economic impact on the land owner and also has an effect on the owner's "investment-backed expectations" or imposes an undue burden on the landowner** (*Penn Central Transp Co. v. New York City*, 438 U.S. 104 (1978)). For example, regulations that permit only certain uses in a flood plain. Courts have recognized the public hazard created by developing flood prone areas, to the occupants, to up and downstream owners, and to the public generally because of increased costs and have generally held that mitigation of this hazard outweighs reduction in property value. See *Gove v. Zoning Board of Appeals* and *Mansoldo v. New Jersey*, cited above; *Krahl v. Nine Mile Creek Watershed District*, 283 N.W.2d 538 (Minn. 1979) (filling would create flood danger).

**4. Government action imposes conditions on the grant of a permit that are not linked to the governmental power to deny a permit (*Nollan v. California Coastal Commission*, 483 U.S. 825 (1987)) and not “roughly proportional” to the purpose impact of the development (*Dolan v. Tigard*, 512 U.S. 374 (1994)).** For example, a requirement of an easement for flood waters. See *Smith v. Town of Mendon*, 4 N.Y.3d 1 (2004) (approving conservation easement restricting development in flood hazard area).



*Courtesy of [www.mass.gov](http://www.mass.gov)*

## Should I Worry? Not for the reasons you may think.

Developers and landowners may attempt to use takings litigation (or the mere threat of litigation) to persuade government officials to relax or abandon land use controls designed to regulate development in a flood hazard area. However, as the previous discussion suggests, the threat of takings liability is more myth than reality. In reality, courts will support carefully drafted and applied floodplain regulations against Takings Clause challenges.

State and local governments are more likely to be successfully sued for engaging in activity (such as failing to enforce regulations, or in a few states, allowing development) that causes or exacerbates damage in future floods than for prohibiting such development. See, for example, *Bragg v. City of Rutland*, 70 Vt. 606 (Vt. 1898) (city liable for damages resulting from drain obstruction); *Alger v. Department of Labor & Industry*, 917 A.2d 508, 2006 VT 115 (2006) (failure to enforce housing code could be taking); *Hutcheson v. City of Keizer*, 8 P. 3d 1010 (Ore. 2000) (liability for approval of subdivision plans that led to flooding).

Notwithstanding the rhetoric of the property rights debate, local officials are the true defenders of property rights. The overwhelming majority of property owners in the United States are homeowners whose interests are protected and property values enhanced by local zoning and other land use controls.

*Communities should be more concerned about liability for assisting or permitting poorly planned development that harms others than the risk of being sued for preventing that harm in the first place.*

If towns build a proper record of the adoption of their regulations and actions on permit applications; work closely with the municipal attorney, the state floodplain coordinator, your regional planning commission, and other land use experts to address real hazards; avoid unduly severe economic hardships; and proceed in a fair and equitable manner, you should prevail in court or avoid costly litigation altogether.

# Meeting Minimums is Not Enough

Community leaders may believe that adopting the minimum regulatory standards under the National Flood Insurance Program will protect them from liability from both fronts of concern: developers threatening takings litigation and landowners at possible risk of damage in the next flood. Unfortunately, they may be wrong on both counts.

FEMA itself supports the adoption of higher regulatory standards than it promulgates. Communities may adopt such higher standards without incurring takings liability if they carefully follow the procedural steps suggested above. Communities that fall back on just the minimum federal standards may allow diversion of floodwaters onto other properties, loss of channel conveyance and storage, and an increase in erosive velocities, all of which may make the community liable under the Takings Clause or for negligence.

*Ultimately, any new development that is allowed to adversely impact other properties may make **the community liable**, even if minimum standards are met. Therefore, it is incumbent upon local officials to adopt flood regulations that truly do protect their communities, then administer these fairly and consistently, and enforce them when need be.*

## Additional fact sheets include:

- #1 Floodplain Basics
- #3 Living with Inadequate Maps
- #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](http://www.vtwaterquality.org/rivers/htm/rv_floodhazard.htm)

### **Vermont Law School's Land Use Institute**

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

### **Two Rivers-Ottawaquechee Regional Commission**

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*Produced by the Two Rivers-Ottawaquechee 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.*



## 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 FIRMs, or new DFIRMs, 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.

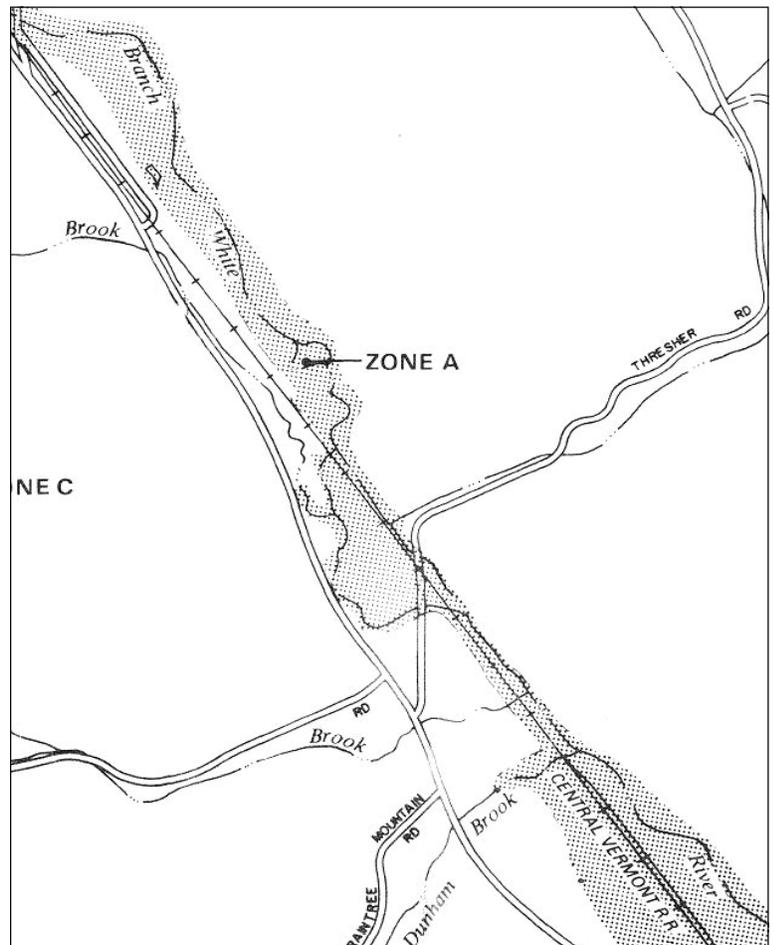


*Ice jams on the Ottawaquechee River, Woodstock, 2007*

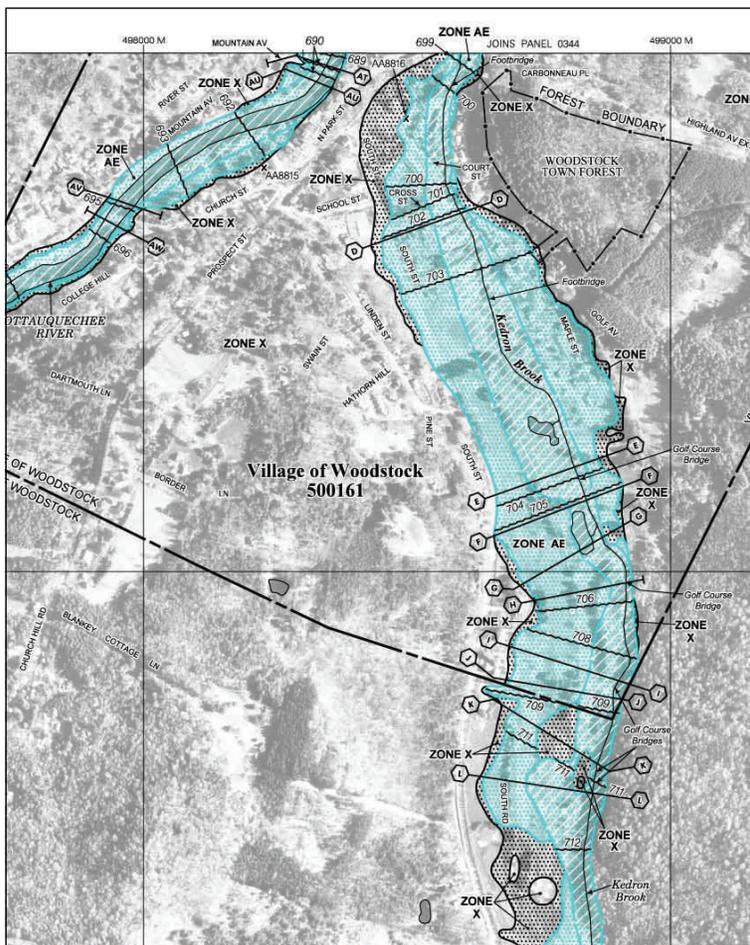
Additionally, obstructions such as ice, debris, flooding in surrounding areas, groundwater or other phenomena can cause flood levels to exceed those indicated on the map. Land adjacent to a floodplain may be subject to flooding from tributary watercourses, many of which were not studied for flood risks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

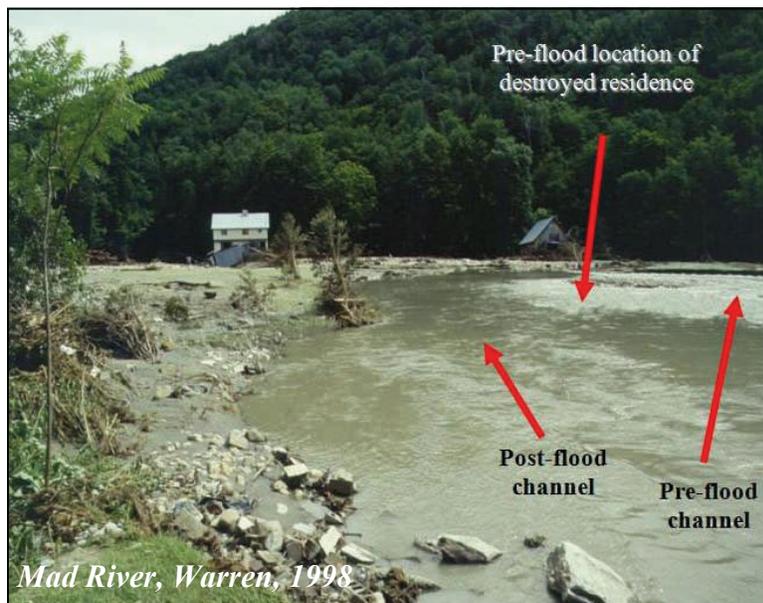
## Improving Flood Maps

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

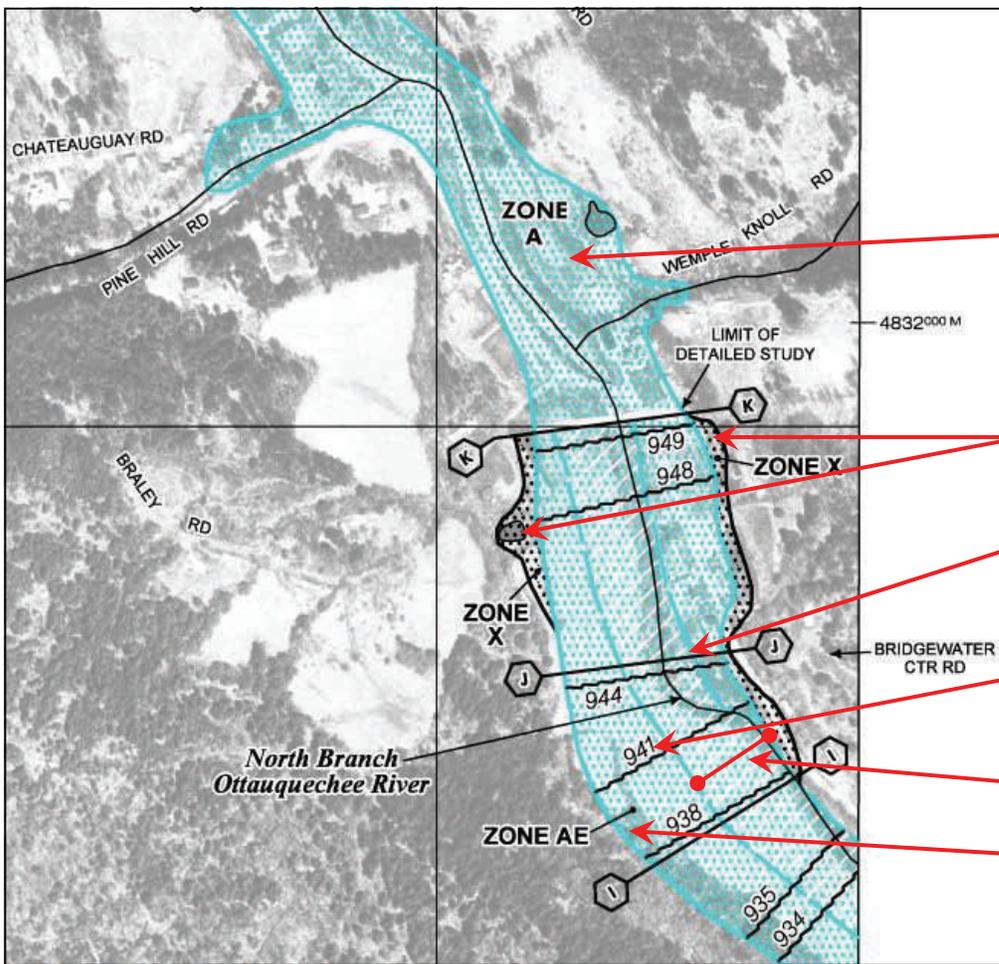
mapping is improved.

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.*

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# USING FREEBOARD AND SETBACKS TO REDUCE DAMAGE



## What is Freeboard and Why is it Good?

“Freeboard” is a nautical term for the amount of boat above the water line, and for purposes of floodplain management means extra elevation (usually expressed in feet) above the estimated base flood elevation. Freeboard requirements compensate for the many unknown factors that could contribute to flood heights greater than the height calculated on flood maps, such as ice and debris jams, restrictive bridge openings, and the hydrological effect of urbanization of the watershed. Any fill that was placed in the floodplain after the maps were produced also has raised flood heights to some degree beyond what the maps show. Freeboard also provides a factor of added safety for when the actual flood levels are higher than that calculated for the "100-year flood."

*"Freeboard" is defined as follows (from 44 CFR 59.1):*

*Freeboard means a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed.*

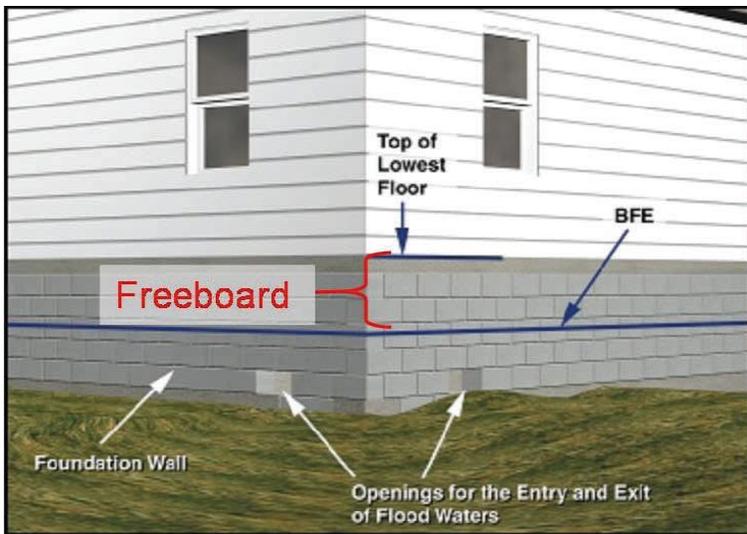
An example of a freeboard requirement is that a local floodplain management ordinance may require a structure's lowest floor to be placed 1 foot (at a minimum) above the 100-year flood level. Many communities across the nation have chosen to have 2 feet or even 3 extra feet for their freeboard requirements.

Conventional wisdom suggests that modern maps are accurate: clearly and flawlessly depicting features, distances, and issues for development planning. However, the fact that maps are now digital and look high-tech can belie underlying errors. Maps are only as accurate as the data that created them, and in the case of floodplain maps, representations of risk may be products of highly-detailed modeling or simply best estimates based on historical records. (For more information on floodplain maps and mapping, please see the companion fact sheet #3 *Living with Inadequate Maps*.)

Many communities are now receiving new flood maps, but these are often just digital versions of previous maps, not maps created from new flood data. *(cont'd on page 2)*

# What is Freeboard and Why is it Good? (cont'd)

When flood hazard areas are actually recalculated using the latest topography and other information, recalculated flood heights in parts of Vermont have been raised by a few feet. Having freeboard provisions provides a margin of safety for new development in poorly mapped areas, helping landowners and developers to avoid unpleasant surprises if an area is restudied for new flood maps.



Courtesy of VTDEC River Management Program

## Use of Setbacks

Setbacks are the horizontal version of freeboard, limiting development in areas that may be at risk of flooding, even though they may not be designated as such on FIRMs. This can take place in two ways – restricting basements near the flood zone, and staying back from eroding stream banks.

Flood regulations must restrict basements within the flood zone, since water above the ground also means water below the ground. However, most regulations stop restricting basements right

outside the flood zone boundary. Even though the *surface* may not be inundated beyond that point, water can be in the soil and under considerable pressure well past it. Therefore, continuing to restrict basements near mapped flood zones can be a prudent public safety measure.

Areas with eroding streambanks may be at an elevation where they will never flood, but then the river moves sideways, the bank fails, and what was high and dry falls into the river.

Significant amounts of flood damage occur in exactly this way in Vermont. Keeping structures fifty feet back from the top of streambanks is the recommended state minimum.

*These homes under construction in Stowe are near an obviously eroding bank. The river moving towards the homes is more of a danger than a flood rising over the bank.*

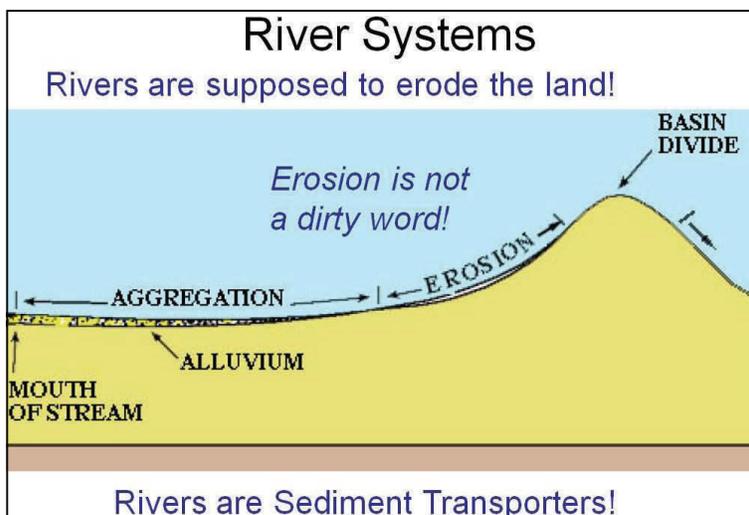


Courtesy of VTDEC River Management Program

## Fluvial Erosion Hazards (FEH)

Much flood damage in Vermont is associated with stream channel instability, also known as the fluvial erosion hazard (FEH), as opposed to inundation related losses. This is a reflection of Vermont's natural geography and its human landscape consisting of steep, relatively narrow valleys with agricultural land uses, highway infrastructure, private residences and commercial properties located in close proximity to stream channels.

River channels that are undergoing an adjustment process as a result of historic channel management activities or floodplain encroachments oftentimes respond catastrophically during large storm events.



*Courtesy of VTDEC River Management Program*

Historically, landowners and local government have relied on the standards and the flood hazard boundary maps provided by the Federal Emergency Management Agency (FEMA) through the National Flood Insurance Program (NFIP) to determine areas within river corridors susceptible to flood damage. The maps are also used to delineate the allowable (floodway) limits of river corridor encroachments and human land use investments. However, the NFIP maps

address only inundation issues by applying a water surface elevation based standard. For this reason the NFIP maps are often inadequate as an indicator of flood hazards, especially erosion.

The NFIP standards do not recognize the danger present in unstable channels which may be undergoing a physical adjustment process. The stream bed may be eroding or it may be actively aggrading due to erosion occurring upstream.

*The damage in the photo below occurred in a single flood event where the channel moved precariously close to the structure.*

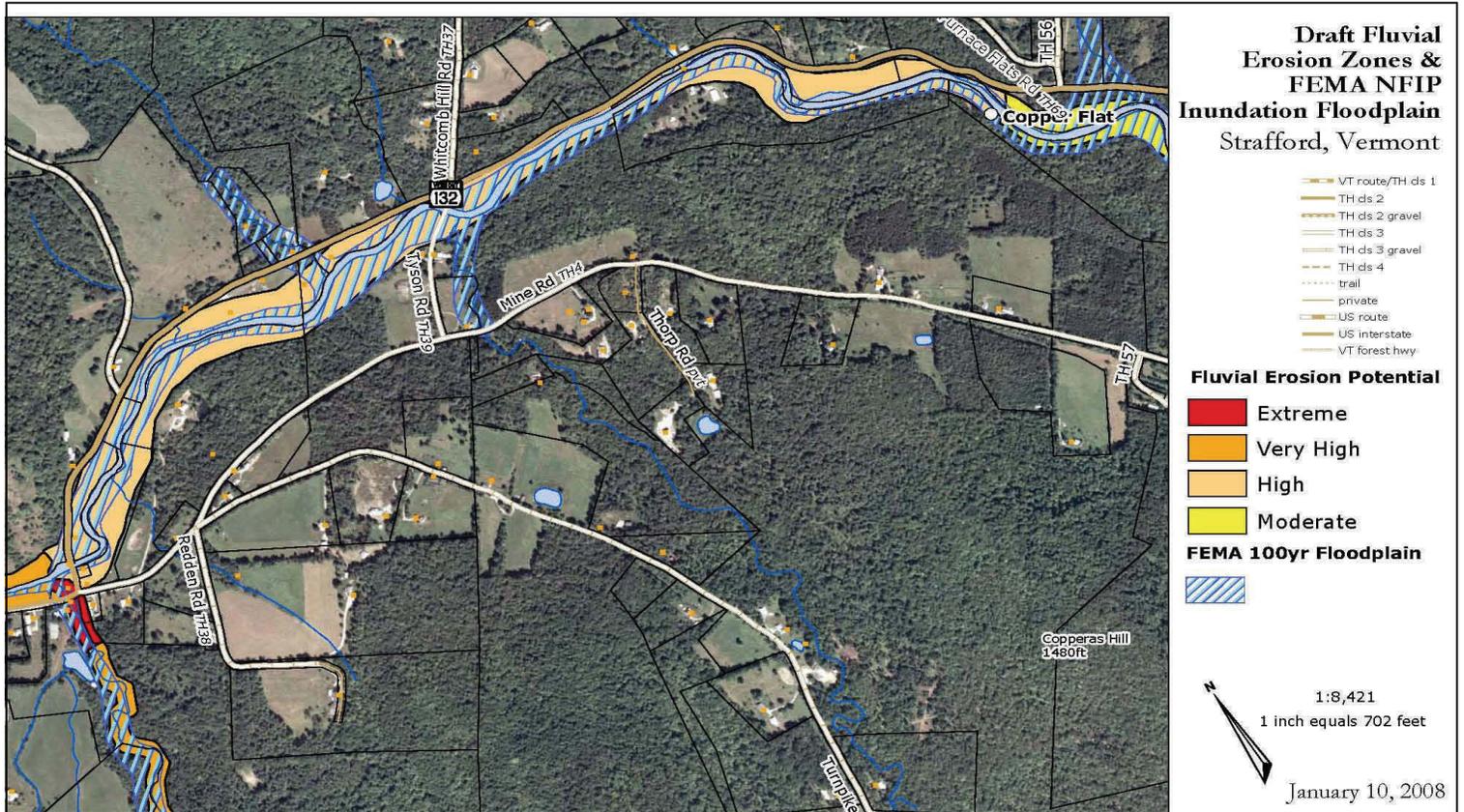


*Courtesy of VTDEC River Management Program*

The NFIP standards often allow for significant encroachment within floodplain areas and river corridors that may prevent the stream from ever re-establishing its stability.

Special mapping and geomorphic assessments can identify FEH areas along rivers, more comprehensively defining high-hazard areas. For more information on this additional area that towns should consider regulating, contact your regional planning commission or VT DEC's River Management Program. *(This article is adopted from a factsheet by the River Management Program).*

*This is an example of a map showing both floodplains and fluvial erosion hazard (FEH) areas. Note that the FEH zones are often much larger than the floodplains, in this case showing many areas unlikely to be inundated but having a very high risk from erosion.*



*Example of map for Strafford, Vermont. (TRORC)*

Additional fact sheets include:

- #1 Floodplain Basics
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- #6 Protecting Lives & Property Through the NFIP Community Rating System.

For more information, contact:

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[www.vtwaterquality.org/rivers/html/rv\\_floodhazard.htm](http://www.vtwaterquality.org/rivers/html/rv_floodhazard.htm)

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*Produced by the Two Rivers-Ottawaquechee 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.*

# NO ADVERSE IMPACT FLOODPLAIN MANAGEMENT



## What is No Adverse Impact?

“No Adverse Impact” (NAI) floodplain management is a managing principle developed by the Association of State Floodplain Managers (ASFPM) to address deficiencies in the typical local floodplain management program. Town leaders may believe that adopting the minimum regulatory standards under the National Flood Insurance Program (NFIP) will protect them from liability from both fronts of

concern: developers threatening takings litigation and landowners at possible risk of damage in the next flood. Unfortunately, they may be wrong on both counts. Rather than depending on minimum requirements of federal or state programs, NAI provides tools for communities to help ensure a higher level of protection for their citizens and to prevent increased flood damage now and in the future.



*“No Adverse Impact Floodplain Management” is a managing principle that is easy to communicate and from a policy perspective, tough to challenge. In essence, No Adverse Impact floodplain management is where the action of one property owner does not adversely impact the rights of other property owners, as measured by increased flood peaks, flood stage, flood velocity, and erosion and sedimentation.*

NAI floodplain management is an approach that ensures the action of any community or property owner, public or private, does not adversely impact the property and rights of others. An adverse impact can be measured by an increase in flood stages, flood velocity, flows, the potential for erosion and sedimentation, degradation of water quality, or increased cost of public services. No Adverse Impact floodplain management extends beyond the floodplain to include managing development in the watersheds where increased runoff of storm water and floodwaters originate. NAI does not mean no development. It means that any adverse impact caused by a project must be mitigated, preferably as provided for in the community or watershed based plan.

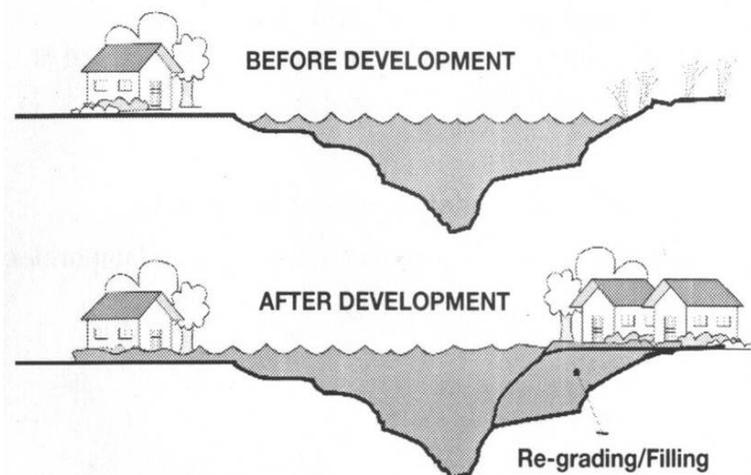
For local governments, No Adverse Impact floodplain management represents a more effective way to tackle their flood problems. The concept offers communities a framework to design programs and standards that meet their true needs, not just the requirements of a federal or state governmental agency. The NAI floodplain management initiative empowers communities (and their citizens) to work with stakeholders and build a program that is effective in reducing and preventing flood problems.

# What is No Adverse Impact? (cont'd)

NAI floodplain management is about communities being proactive—identifying potential impacts and implementing strategies to prevent and mitigate those impacts before they occur.

## What's Wrong with FEMA/ NFIP Minimum Standards?

The Federal Emergency Management Agency (FEMA) has long supported the adoption of higher regulatory standards through the Community Rating System and state or local programs to offer incentives for safer development practices. Communities that fall back on the minimum federal NFIP standards may allow diversion of floodwaters onto other properties, loss of channel conveyance and storage, and an increase in erosive velocities, ALL of which may make the community liable under the Takings Clause or negligence. Ultimately, any new development that is allowed to adversely impact other properties may make the community liable, even if minimum standards are met.



Courtesy of VTDEC River Management Program

*44 CFR 60.1(d) "...community officials may have access to information or knowledge of conditions that require, particularly for human safety, higher standards than the minimum criteria set forth...Therefore any flood plain management regulations adopted by a State or a community, which are more restrictive than the criteria set forth in this part are **encouraged** and shall take precedence." - FEMA NFIP Regulations*

It is important to remember that the National Flood Insurance Program was designed with insurance in mind, and was never intended to be the nation's land use program for floodplain management. Relying exclusively on NFIP minimum standards may lead to:

- ◆ Adverse cumulative impacts of allowing small rises in flood elevation here and there, that accumulate into significant and hazardous changes, subjecting families and businesses to greater flood risks;
- ◆ Increased storm water velocities that worsen erosion, sedimentation, streambank failure, and new stream channel formation; and,
- ◆ Increased destructive potential, as what were once manageable storms become major producers of flood damage and associated disruption and misery.



Great Brook, Plainfield, VT

# NAI Strategies

No Adverse Impact watershed management relies on a combination of development planning, standards, and review to ensure that proposed and anticipated development will not adversely impact other property interests through increased runoff, velocities, or degradation. Since each community is unique – and no one knows your community better than you, the local official – NAI provides the flexibility for each community to adapt strategies to fit unique community interests, watershed dynamics, political will, vision, and goals.

Your community can adapt the following approaches to meet your unique management needs:

- ☑ Develop hazard mitigation actions in a Pre-Disaster Mitigation Plan to reduce losses from flooding;
- ☑ Create mutual aid agreements to aid in flood warning and response; and,
- ☑ Implement higher standards to achieve no increase in flood damage through the use of restrictions on impervious cover, no net fill, freeboard requirements, and additional setbacks to take erosion into account.

Under the NAI approach, the developer and community work together to:

- ☑ Identify the impacts of proposed development;
- ☑ Notify potentially impacted property owners;
- ☑ Explore design alternatives to avoid adverse impacts; and,
- ☑ Develop appropriate mitigation measures that are acceptable to locals, neighbors, and the community as a whole.

# The NAI Legal Framework

*“NAI is a PRINCIPLE that leads to a PROCESS that is legally acceptable, non-adversarial, understandable, and palatable to the community as a whole.”*

*- Edward A. Thomas, Esq.; Floodplain Manager, Disaster Response and Recovery Specialist, and Attorney*

NAI does not take away property rights – it protects them by preventing one landowner’s activities from harming others. NAI is not an arbitrary or inflexible denial of development rights, or blanket no-growth strategy. It is a performance-based standard consistently favored by courts when challenged. While no strategy can completely eliminate all possible legal challenges, following the NAI approach to floodplain and watershed management can help to:

- ◆ Reduce the number of lawsuits filed against local governments;
- ◆ Greatly increase the chances that local governments will win legal challenges arising from their floodplain management program;
- ◆ Reduce or eliminate the chances of surprising or alienating developers who want to do business, but find little or no guidance until project design is well underway;
- ◆ Ensure that critical facilities, such as hospitals, schools, police, fire and EMS facilities, are well above current and future flood elevations and fully accessible during flood events;
- ◆ Educate community leaders, families, and businesses regarding the community’s flood risks and how to stay safe in a flood.

*(cont’d on page 4)*

# The NAI Legal Framework (cont'd)

The legal system has long recognized and supported the local community duty to identify hazards and prevent harm. Courts throughout the nation, including the US Supreme Court, have consistently shown great deference to governments acting to prevent loss of life or property, even when protective measures restrict some uses of private property. Recent decisions confirm that:

- ◆ Communities have the legal authority to manage flood risks and development;
- ◆ Communities have the legal responsibility to do so, and may be liable for any harm resulting from failure to exercise that responsibility; and,
- ◆ Property owners who increase flooding or erosion, or violate reasonable watershed or floodplain standards, are intruding on the property rights of others. The community is seen as the first line of defense against this intrusion.

For more information on this subject, please go to the ASFPM website at [www.floods.org](http://www.floods.org) and view the many resources under the No Adverse Impact link.



## Additional fact sheets include:

- #1 Floodplain Basics
- #2 Protecting Property Rights to Reduce Local Liability
- #3 Living with Inadequate Maps
- #4 Using Freeboard and Setbacks to Reduce Flood Damage
- #6 Protecting Lives & Property Through the NFIP Community Rating System.

## For more information, contact:

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# PROTECTING LIVES & PROPERTY THROUGH THE NFIP COMMUNITY RATING SYSTEM



## What is the Community Rating System?

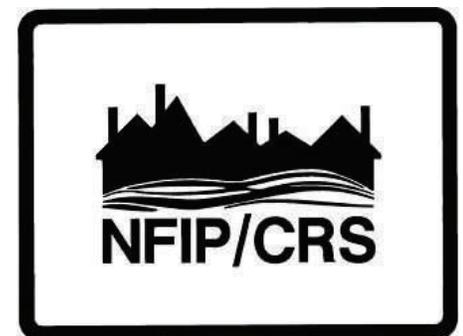
The Community Rating System (CRS) is a part of the National Flood Insurance Program. The CRS reduces flood insurance premiums to reflect what a community does above and beyond the NFIP's minimum standards for floodplain management. The objective of the CRS is to reward communities for what they are doing, as well as to provide an incentive for new flood protection activities. The reduction in flood insurance premium rates is provided according to a community's CRS classification.

There are 10 CRS classification levels for communities. All NFIP communities start at Class 10 and begin to receive reduced premium rates at Class 9. Each time a community goes to a lower class, premiums for properties in the special flood hazard area are reduced by 5%. The maximum benefits under the program are at Class 1 with a 45% reduction. In Vermont, Bennington, Brattleboro and Montpelier are currently the only CRS communities.

To earn CRS credit, your community can do things like:

- ◆ Preserve open space in the floodplain;
- ◆ Enforce higher standards for safer new development;
- ◆ Maintain drainage systems; and
- ◆ Inform people about flood hazards, flood insurance, and how to reduce flood damage.

**Community participation in the CRS is FREE and VOLUNTARY.**



Your community is probably already doing many of these things. To get credit, you simply prepare an application showing what's being done. Once the information is verified, FEMA provides the flood insurance premium discounts, putting money back into the pockets of your residents. Applications go to the Insurance Services Office Inc. (ISO). Vermont's current ISO contact is Jimmy Chin [jchin@iso.com](mailto:jchin@iso.com)



# What Are the Benefits of Participation?

When your community participates in the CRS, everyone benefits, including those who don't live or own property in a floodplain. Even when there is no flooding, your community's public information and floodplain management efforts can improve the quality of life, protect the environment, make people safer, and save everyone money. And when there is a flood, your CRS activities:

- ◆ Save lives;
- ◆ Prevent property damage;
- ◆ Avoid lost jobs and economic devastation caused by flooding of offices, factories, farms, stores, and other businesses; and,
- ◆ Prevent damage and disruption to roads, schools, public buildings, and other facilities.

Reduced flood insurance rates are only one of the rewards a community receives from participating in the CRS. There are several other benefits.

First, the CRS floodplain management activities improve public safety, reduce damage to property and public infrastructure, avoid economic disruption and losses, reduce human suffering, and protect the environment.

Second, your town can evaluate the effectiveness of its flood program against a nationally recognized benchmark.

Third, technical assistance in designing and implementing many activities is available at no charge.

Fourth, a CRS community's flood program benefits from having an added incentive to maintain its flood programs over the years.

The fact that the community's CRS status could be affected by the elimination of a flood-related activity or a weakening of the regulatory requirements for new development should be taken into account by the governing board when considering such actions. A similar system used in fire insurance rating has had a strong impact on the level of support local governments give to their fire protection programs.

Fifth, implementing some CRS activities, such as floodplain management planning, can help a community qualify for certain Federal assistance programs.

## What's Wrong with FEMA/NFIP Minimum Standards?

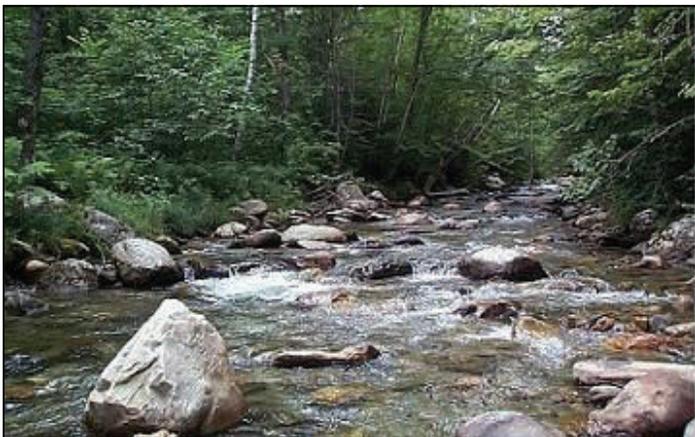
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## Additional Benefits: Natural & Beneficial Floodplain Function

The CRS encourages State, local, and private programs and projects that preserve or restore the natural state of floodplains and protect the natural and beneficial floodplain functions. The CRS also encourages communities to coordinate their flood loss reduction programs with Habitat Conservation Plans and other public and private activities that preserve and protect natural and beneficial floodplain functions:

- ◆ Flood waters can spread over a large area in floodplains that have not been encroached upon. This reduces flood velocities and provides flood storage to reduce peak flows downstream;
- ◆ Water quality is improved in areas where natural cover acts as a filter for runoff and overbank flows; sediment loads and impurities are also minimized. Natural floodplains moderate water temperature, reducing the possibility of adverse impacts on aquatic plants and animals;
- ◆ Floodplains can act as recharge areas for groundwater and reduce the frequency and duration of low flows of surface water; and,
- ◆ They provide habitat for diverse species of flora and fauna, some of which cannot live anywhere else. They are particularly important as breeding and feeding areas.



## Getting Credit with CRS Activities

At a minimum, your town must be in the NFIP and in full compliance. You must require and maintain FEMA's elevation certificates for all new and substantially improved construction in the floodplain. Lastly, if your town has properties that have received repeated flood insurance claim payments, then you must map the areas affected. Communities with 10 or more such properties must prepare, adopt, and implement a plan to reduce damage in repetitive loss areas. The FEMA Regional Office can tell whether this applies to your town.

Additional activities that generate credit points are grouped into four main categories: Public Information, Mapping and Regulatory Activities, Flood Damage Reduction, and Flood Preparedness. Examples of these activities are discussed below.

### Public Information Activities

- ◆ Maintain FEMA elevation certificates for all new construction.
- ◆ Respond to inquiries to identify a property's FIRM zone and publicize this service.
- ◆ Send information about the flood hazard, flood insurance, and flood protection measures to floodprone residents or all residents of the community.
- ◆ The public library maintains references on flood insurance and flood protection.

*(cont'd on page 4)*

# Getting Credit with CRS Activities (cont'd)

## Mapping & Regulatory Activities

- ◆ Require that developers provide new flood elevations, floodway delineations, or other regulatory flood hazard data for an area that was not mapped in detail by the flood insurance study.
- ◆ Guarantee that a portion of currently vacant floodplain will be kept free from development.
- ◆ Implement higher standards
  - ◇ Require freeboard
  - ◇ Have regulations tailored to protect critical facilities or areas subject to special flood hazards (e.g., alluvial fans, ice jams, or subsidence).
- ◆ Keep flood and property data on computer records; obtain improved base maps through partnerships with neighboring communities; and maintain elevation reference marks.
- ◆ Regulate new development throughout the watershed to ensure that post-development runoff is no worse than pre-development runoff.

## Flood Damage Reduction Activities

- ◆ Prepare, adopt, implement, and update a comprehensive plan using a standard planning process.
- ◆ Acquire or relocate floodprone buildings so that they are out of the floodplain.
- ◆ Document floodproofed or elevated pre-FIRM buildings.
- ◆ Conduct periodic inspections of all channels and retention basins and perform maintenance as needed.

## Flood Preparedness Activities

- ◆ Provide early flood warnings to the public and have a detailed flood response plan keyed to flood crest predictions.
- ◆ Maintain levees that are not credited providing base flood protection.

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