INTRODUCTION

Chapter Summary

Rivers and streams are part of nature's system for carrying water from high ground down to the ocean. Floodplains are part of the system created for carrying unusually large amounts of water, i.e.: floods. Flooding is a natural process, and floodplains play a vital role in that process.

FLOODPLAINS AS NATURAL DRAINAGE AREAS

Photo by Bridget Weber, FEMA.

Under natural conditions, flooding causes little or no damage. Unfortunately, over the years, little regard has been given to the original purpose of floodplains. Floodplain preservation, and the associated concern for the safety of property and life, has been given little consideration when weighed against community development interests. Homes, businesses, and even whole communities have been built in flood hazard areas. This development of floodplains has resulted in continual and, often severe, social and economic loss.

Early decisions to locate in floodplains were driven partly by the fact that the waterways served as a means of transportation. Settlements relied on river boats and canoes for access to outside markets. Out of necessity, mills located on or near the waterways to take advantage of the hydropower. Because of the natural values of water, locating near a water body also provided access for domestic purposes such as drinking water and agriculturally fertile lands with easily tillable soil. Consequently, many of the United States major metropolitan areas were developed adjacent to a major waterway.

There is also a growing appreciation for locating along waterways for aesthetic and recreational reasons. These lands offer value, and the availability of land that is considered desirable for development is lessening. As many communities have exhausted some of the better, low-risk areas of the town, increasing pressure is put on local officials to allow development of "less expensive land." History has taught us that allowing development in these locations carries a price, financial and otherwise.

Along with the benefits associated with community development, development in floodprone areas has associated costs due to periodic flooding including:

- Loss of life (old estimates reported an average of 150 lives a year were lost to flooding). However, recent hurricane seasons have distorted the number of dead resulting form floods so much that any number given is likely to be challenged as an unrealistic average. Katrina alone account for more than 2,500 dead or lost.
- Disruption of businesses and communities. According to the Small Business Administration, many small businesses do not reopen after significant flooding events. They are unable to absorb the loss

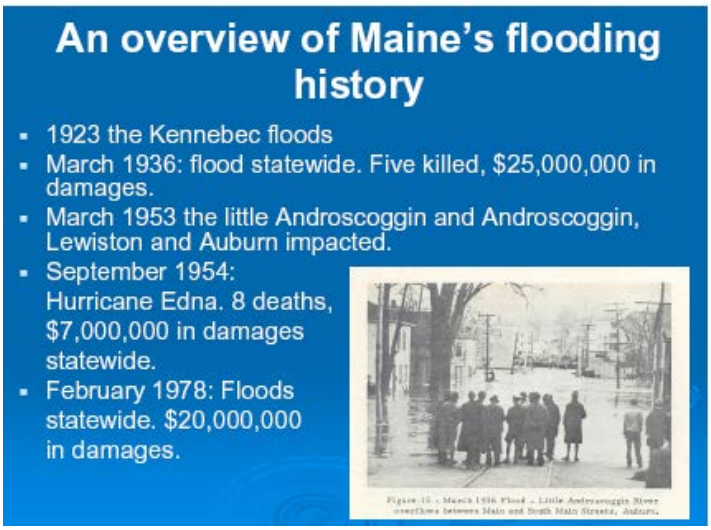
of business. Flood insurance does not cover the loss of business, only the damages or loss of the building and contents and of course they don't pay anything if the owner didn't carry flood insurance.

- Property and infrastructure damages averaged $4.6 billion a year for the 20-year period 1984-1993. In the aftermath of the 2004 hurricane season some sources suggest that as Hurricanes Charlie, Ivan, Frances and Jeanne caused as much as $45 billion in losses in Florida. The estimates from the hurricane season of 2005 when Katrina, Wilma and Rita hit the Gulf coast run from $82 billion to $122 billion depending on who was reporting and the actual costs may never really be known.

Flooding can occur in any of the 50 states or in the U.S. territories at any time of year. In most years, flooding causes more deaths and damage than any other type of severe weather. In many years, it is common for three-quarters of all federally declared disaster declarations to include a flooding component.

Cyclical flooding and related problems created led to government becoming involved in finding solutions to reduce flood losses. In the early half of the twentieth century, the typical government responses to flooding -- structural control and disaster relief -- were not totally effective in solving this problem. Despite large governmental expenditures, flood damages nationwide continued to rise. Floodplain management practices developed since then include the pro-active development of regulations that govern the location and structural characteristics of new construction. This is a more effective way to prevent flood damages from increasing. Rather than try to control flooding that damages properties, government should guide new development away from high-risk areas, however, if new construction or improvements must be located in a flood hazard zone, development should be controlled so that flood damages can be avoided.

The History of Flooding in Maine



An overview of the larger floods to affect the state is included as a Power Point presentation on the home page of the web site of the Maine Floodplain Management Program.

What is Floodplain Management?

Floodplain management may be defined as the full range of public and private policy and action to:

- promote the wise use of floodplains,
- reduce flood losses, and
- protect the natural functions and values of floodplains.

Floodplain management directors coordinate several program measures:

- ***structural*** (dams, channel diversions, and levees);
- ***non-structural*** (floodplain development regulations, warning and preparedness, and flood insurance),
- ***corrective,*** to address existing problems (retrofitting); and
- ***preventative, to avoid creating new problems (comprehensive planning and mitigation planning)***

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The purpose of this manual is to give the reader a better understanding of floods and flooding and what an individual or community can do reduce the impact of flooding on both the property owner and the community as a whole.

History of Floodplain Management

Since its earliest years, Americans have responded to floods in a variety of ways. The earliest response was for individuals to bear the losses and the costs associated with clean up and repair. In the late 1880s, Congress made an initial move to establish some Federal responsibility for flood forecasting and warning systems.

The Mississippi River Commission (1879)

In 1879, Congress created the Mississippi River Commission. In doing so, Congress directed the U.S. Army Corps of Engineers the authority and resources to develop the means necessary to prevent destructive floods from affecting life and property.

Flood Control Act of 1917

Direct Federal involvement in flood control began with the passage of the Flood Control Act of 1917, which authorized several specific flood control projects. Most of the projects were located along the Mississippi River. That same year, the United States Department of Agriculture (USDA) developed researched-based studies for rainfall and runoff measurements. These initial studies included the basic concepts and data for development of the rational method for computing maximum runoff.

Flood Control Act of 1928

Following the Great Flood of 1927, Congress gave the U.S. Army Corps of Engineers more responsibility for flood control and navigation on the Mississippi River.

TVA Act of 1933

This Act established the Tennessee Valley Authority and its regional program of resource development. The TVA established a number of hydro/flood control dams on inland waterways.

The United States-Mexico Convention of February 1, 1933

The Convention provided for stabilization and flood control of the international boundary along a 90-mile section of the Rio Grande River.

Flood Control Act of 1936

Significant federal flood control activity did not begin until the Flood Control Act of 1936 was passed. It was passed in response to a series of major floods on the Potomac, Susquehanna, and upper Ohio River Basins. This Act expanded Federal responsibility to all navigable rivers of the nation and authorized over 200 flood control projects in 31 states. It further extended the scope of federal involvement, assigning the federal government the full cost of building and maintaining dams, channel modifications, levees and floodwalls. Over the next 50 years, from 1936 to 1986, Congress authorized and built approximately 900 flood control projects including approximately 400 flood control dams, thousands of miles of levees, floodwalls, floodways and improved channels. With Congressional blessing, the U. S. Army Corps of Engineers was tasked with keeping the water away from the development, in essence, to attempt to conquer nature. Billions of dollars were spent on these structural "improvements."

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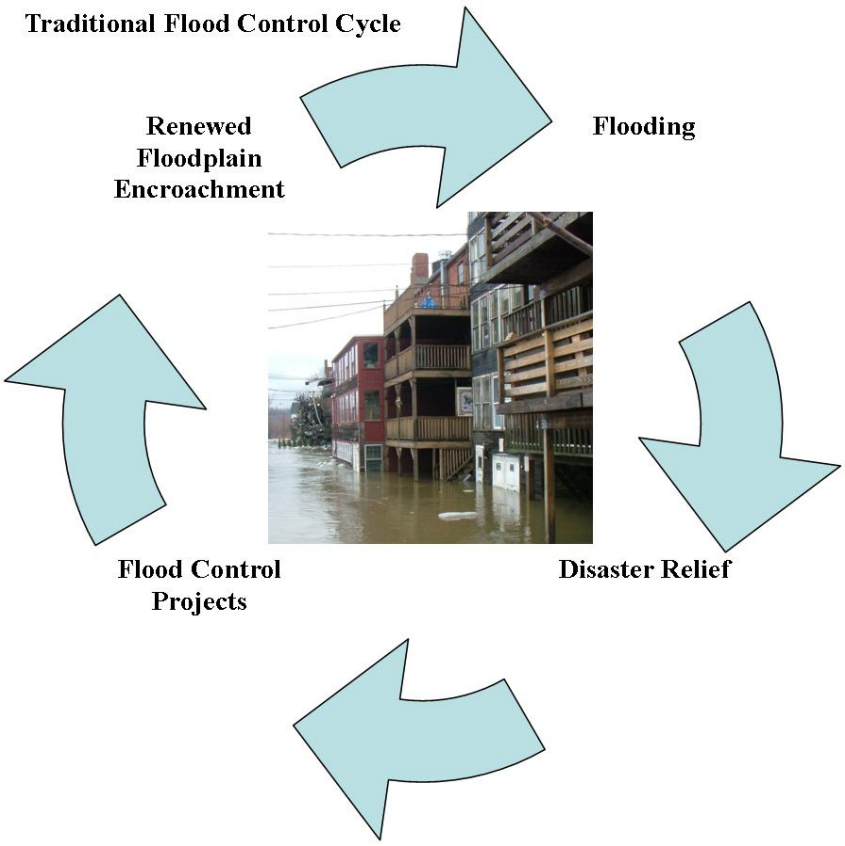
A well established (vicious) cycle was now in place:

flooding →disaster relief→flood control projects→renewed floodplain encroachment→repeated flooding



President Truman attempts a Flood Insurance bill in 1952

In spite of the billions spent on flood control projects, flood losses continued to rise rapidly due to continuing, extensive floodplain development. Billions of dollars continued to be spent on disaster relief. Many of the flood control structures built adversely affected our natural resources and environmental quality. Although federal flood control efforts saved many lives and billions of dollars in property damage, Congress realized that protective works alone would not stem the increase in flood losses. In 1952 President Truman asked Congress to consider a bill to establish a Federal flood insurance program after flooding in 1951, but Congress did not pass the bill. In 1955, major floods hit several parts of the country again, thereby reviving and broadening community interest in developing a national flood insurance program.

Flood Insurance Act of 1956

Congress passed the Flood Insurance Act of 1956 but it was never funded because the property insurance industry continued to oppose such a program due to its impracticability for business. In the 1960s, there was a shift in how the country approached flooding problems. This new perspective included a growing concern about limiting development near waterways and in the floodplain.

House Document 465 – 1966

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Congress began to recognize that protective works alone would not stem the increase in flood losses. This led to the creation of a presidential task force on Federal Flood Control Policy and the 1966 publication of House Document 465, "A Unified National Program for Managing Flood Losses." The document included five major goals:

- improve basic knowledge about flood hazard
- coordinate and plan new developments in the floodplain
- provide technical services to managers of floodplain property
- move toward a practical national program for flood insurance; and
- adjust federal flood control policy to support sound criteria and changing needs.

Southeast Hurricane Disaster Relief Act of 1965

In September 1965, at roughly the same time House Document 465-1966 was being developed, Hurricane Betsy killed 74 people and caused $1.42 billion in damage (in 1965 dollars) in Louisiana, Florida and the Bahamas. This Act directed the Secretary of Housing and Urban Development to examine the feasibility of insurance and other programs for financial assistance to flood victims. The resulting report "Insurance and Other Programs for Financial Assistance to Flood Victims," along with" A Unified National Program for Managing Flood Losses" concluded in 1966 that a national program of flood insurance was both feasible and in the public interest. This led to the enactment of the National Flood Insurance Act of 1968.

The National Flood Insurance Act of 1968

(The creation of the National Flood Insurance Program)

In 1968 Congress passed the National Flood Insurance Act (42 USC 4001) to correct the shortcomings of traditional flood protection and flood relief programs. The National Flood Insurance Program (NFIP) makes flood insurance available to property owners in communities that agree to adopt an ordinance regulating development in floodprone areas. The combination of development regulations and insurance means that there is help for everyone already living in a floodplain. In addition, new construction is regulated to ensure that it is not subject to flood damage and does not impede or deflect flood flows. Insurance provides relief for even small floods, unlike disaster relief. It also means that floodplain residents are now paying for a greater share of the assistance program. More information about the structure of the NFIP and about flood insurance can be obtained from the Maine Floodplain Management Program or FEMA.

The intent of the NFIP is not to prohibit, but to **guide** development in floodplain areas in a manner consistent with both nature's need to convey flood waters and a community's land use needs. The floodplain regulations required by the NFIP are designed to accomplish two basic objectives related to flood damage protection:

- to prevent new developments from increasing flood damages to others, and
- to ensure that new buildings will be free from flood damage.

There are four basic components to floodplain regulation:

1. the area of the community where the floodplain regulations apply is identified and labeled as the floodplain, or Special Flood Hazard Area;
2. certain activities in the floodplain are brought under regulation;
3. the development standards for these activities are specified; and
4. a system to administer and enforce the rules is established.

The National Flood Insurance Act has been amended several times since it was enacted in 1968. Subsequent changes are addressed below.

1973 Flood Disaster Protection Act (FDPA)

In 1972, Hurricane Agnes demonstrated the ineffectiveness of the voluntary flood insurance program that was implemented in 1968. As a result, Congress passed the Flood Disaster Protection Act in 1973, which tightened the flood insurance program by providing sanctions, which were directed primarily to lending institutions. It was the most significant expansion of both the provisions and the national impact of the NFIP.

This Act required:

- acceleration in the rate at which Flood Insurance Studies are conducted;
- notification to communities that they were identified as being floodprone; and
- creating mandatory requirements for purchasing flood insurance for loans that were backed by the federal government.

The notification process appears to be what got our Maine communities to join the Program. In looking at the files, the indications are that most communities joined between 1973 and 1975. The mandatory purchase requirement may have been a significant factor in their decision to join the NFIP. Any lending institution regulated by a federal instrumentality had to require flood insurance on any loan for a structure in the 100 year floodplain. This included, for example, the FDIC, FSLIC, SBA, VA, and FHA. Today this concept is often termed "the lender compliance issue." In recent decades, these requirements have resulted in an increase in the number of communities participating in the NFIP program; and an increase in the number of flood insurance policies purchased.

A study done by FEMA after the flood of April 1, 1987 determined that very few of those structures that should have had flood insurance were actually insured during the disaster. This indicated a lender problem. This problem and others spurred a national effort to increase the lender compliance. More information on lender compliance is available in FEMA publication 186, *Mandatory Purchase of Flood Insurance Guidelines* available from the Maine Floodplain Management Program or FEMA Region I.

Now, following most major flooding disasters, the federal government does an analysis to see how well the lending institutions did their job in that area. It usually is less than ideal. However, the lenders are now becoming aware of their responsibilities, and current indications appear that they are beginning to be very conservative in their review of flood hazard determinations. If there is a doubt, they are requiring flood insurance. In light of the S&L bailout and the poor performance in the flood insurance arena, the instrumentalities have tightened the reins on the lending institutions. Many municipalities have seen an increase in inquiries and continue to see a rise in outside interest in the NFIP.

Executive Order 11988, 1977

Executive Order 11988, Floodplain Management, addresses concerns about the potential loss of the natural and beneficial functions of the nation's floodplains as well as the increased cost to federal, state, and local governments from flooding disasters that are worsened by unwise development of the floodplain. When funding actions, Federal agencies are required to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. FEMA's procedures for implementing this Executive Order are found at Title 44 Part 9 of the Code of Federal Regulations (44 CFR 9). Section 9.6 of these procedures includes an eight-step process that decision-makers must use when considering projects that have potential impacts to or within a floodplain.

Executive Order 11990, 1977

The purpose of Executive Order 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands." To meet these objectives, the Order requires federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. The Order applies to:

- Acquisition, management, and disposition of Federal lands and facilities construction and improvement projects, which are undertaken, financed or assisted by federal agencies;

- Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities.

Coastal Barrier Resources Act of 1983

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In 1983, the NFIP was amended again to prohibit new Federal expenditures or the sale of flood insurance in any Coastal Barrier area within the Coastal Barrier Resources System as identified by the Department of Interior. Undeveloped coastal barriers are along the Atlantic and Gulf coasts. The act was called the Coastal Barrier Resources Act of 1983 (also known as CBRA). The requirements are found in Part 71 of the NFIP Regulations. Even though a community participates in the Program, flood insurance may be denied in specially designated areas for any new construction or substantial improvement. The purpose of CBRA is to reduce the loss of life and property in these hazardous areas and to protect water quality and other coastal resources. The Act includes provisions that:

- deny Federal assistance (such as grants), flood insurance, and disaster assistance
- prohibit development in designated high hazard areas;
- define and identify undeveloped coastal barriers, and
- place a general prohibition on most Federal activities that might assist development of those barriers.

In 1992, many coastal communities in Maine received new Flood Insurance Rate Maps (FIRMs) because of an expansion in the Department of Interior's Coastal Barriers. Maine state law also prohibits development in Coastal Barriers (Title 38 MRSA §1901-1905).

The Robert T. Stafford Act 1988

The Stafford Act was passed in 1988 and became effective on May 22, 1989. The Robert T. Stafford Relief and Emergency Assistance Act retitled and amended the Disaster Relief Act of 1974. It limits disaster assistance available for damages to under insured or non insured public and non-profit structures. Section 406(d), Flood Insurance, states that Federal disaster assistance to restore insurable structures in special flood hazard areas will be reduced by the maximum amount of insurance proceeds that would have been received had the building and contents been fully covered by a standard policy available through the NFIP.

This is illustrated in a scenario wherein the sewer treatment plan of an NFIP community receives $200,000 in damages during a flood. The community had previously elected to insure it for $20,000. The amount of disaster assistance available to the community is reduced by the amount of additional insurance the community could have purchased (or $180,000) if the property had been properly insured.

The 1994 Flood Insurance Reform Act

The National Flood Insurance Reform Act created several major changes in the National Flood Insurance Program. These changes include legislation to:

- improve compliance with mandatory purchase requirements;
- sets monetary penalties;
- create a new Mitigation Assistance Program;
- increase flood insurance coverage limits;
- increase the flood insurance policy waiting period to 30 days;
- create benefits for communities and property owners that implement mitigation measures;
- modify the Community Rating System
- require a study of the economic impact of mapping erosion hazard areas
- prohibit federal disaster assistance in cases where flood insurance has not been maintained; and
- requires a study of the economic effects of charging actuarially-based premium rates for pre-FIRM structures.

Disaster Mitigation Act of 2000 (DMA 2000)

The Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390) provides an opportunity for states, Tribes and local governments to take a new and revitalized approach to mitigation planning. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Act) by repealing the previous mitigation planning provisions (Section 409) and replacing them with a new set of mitigation plan requirements (Section

322). This new section emphasizes the need for state, Tribal, and local entities to closely coordinate mitigation planning and implementation efforts.

The requirement for a State mitigation plan is continued as a condition of disaster assistance, adding incentives for increased coordination and integration of mitigation activities at the State level through the establishment of requirements for two different levels of state plans: "Standard" and "Enhanced." States that demonstrate an increased commitment to comprehensive mitigation planning and implementation through the development of an approved Enhanced State Plan can increase the amount of funding available through the Hazard Mitigation Grant Program (HMGP). DMA 2000 also established a new requirement for local mitigation plans and authorized up to 7% of HMGP funds available to a state to be used for development of state, Tribal, and local mitigation plans.

Previous to 2002, the Stafford Act included provisions only for Section 404 Mitigation under the Hazard Mitigation Grant (HMGP) program. The Act was modified in 2000, when there was an increase in the percentage of funding that could be allocated for HMGP projects. The Preliminary Disaster Assistance Program was also created.

The Flood Insurance Reform Act (FIRA) of 2004 (passed Senate Banking Committee)

The FIRA strengthened the standards of the National Flood Insurance Program (NFIP) by improving lender compliance. The bill also reauthorized the NFIP to make available nationwide flood insurance, to accelerate recovery from floods, mitigate future losses, save lives, reduce the personal and national cost of flood disasters, and provide a mechanism to deal with structures that experienced repetitive loss.

Local Community Recovery Act of 2006 (FAR Case 2006-014)

This interim rule adds a local area set-aside to the Federal Acquisition Regulation (FAR) for debris clearance, distribution of supplies, reconstruction, and other major disaster or emergency assistance activities. The contracting officer for the disaster defines the local set-aside area. The rule implements the Local Community Recovery Act of 2006, which strengthens the government's ability to promote local economic recovery. The local area set-aside does not replace small business set-asides. Both can be used at the same time. The rule imposes subcontracting restrictions when a local area set-aside is used. No competition justification is required for the local area set-aside.

Photo courtesy of the Maine Department of Transportation April 1, 1987

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Floodplain Management at the State Level

The State Coordinating Agency

The primary purpose of Maine's Floodplain Management Program is to reduce and prevent flood losses to lives and property by assisting communities with developing local floodplain management programs. The responsibilities of the State Coordinating Agency are spelled out in 44 CFR, Part 60.24. While not mandatory, all states have a state NFIP Coordinating Agency. **The Maine Floodplain Management Program** is the agency designated by Maine's Governor as the State Coordinating Agency for the National Flood Insurance Program. Here the MFMP supports the agency's role in providing planning assistance to communities. As the State Coordinating Agency, MFMP assists towns with meeting the standards to join the federal flood insurance program. The Program had been housed at the State Planning Office since 1995. In 2012 it moved to the Departmant of Agriculture, Conservation and Foresty. Two full time positions are currently provided to carry out the responsibilities of floodplain management for the state.

- (1) State Coordinator/Senior Planner
- (1) Planner II
- Shared Clerical and Administrative Support

Description

The snapshot of the Maine physical environment:

Size

- 33,215 square miles (Maine is almost as big as all of the other five New England States put together.)
- 320 miles long and 210 miles wide
- 17,000,000 acres of forests

Communities

- 16 Counties
    - Aroostook County is 6,453 square miles and covers an area greater than the combined size of Connecticut and Rhode Island.
- 917 communities
    - 48% of the communities in New England (FEMA's count of 1027 does not match the state numbers but if we use their numbers we have 53%)
    - 440 Towns
    - 22 Cities (largest is Portland)
    - 30 Plantations
    - 425 Townships
    - 1,274,923 Population of Maine in 2000
        - 41.3 Persons per square mile

Water features

- 6,079 lakes and ponds
- 31,800 miles of rivers and streams
- 5,000,000 acres of wetlands
- 5,299 miles of coastline - tidal influence (approximately 1/3 of the eastern seaboard. Canada to tip of Florida)
- 4,613 Islands and ledges
- 3,500 miles of saltwater
    - Mainland - 2,793.3 miles
    - islands - 2,506.6 miles
- 15 Islands with a year round population
- 2772 square miles of floodplain (larger than the State of Rhode Island)

The snapshot of some of Maine's floodplain management **baselines**:

- 33,000 structures at risk of flooding (approximate based on old FEMA/Donnaly data)

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- 8,234 Flood Insurance Policies in force as of 12/07
- $1,558,369,000 in Flood Insurance coverage as of 12/07
- 4,113 Claims against the program since 1978 as of 12/07
- 61.5% of the flood insurance policies in effect in Maine are in communities with tital influence (coastal communities)
- 53.8% of the flood insurance policies in effect in Maine are in communities with coastal Velocity Zones
- The NFIP collects approximately $5,959,707 annually in flood insurance premiums (12/07)
- 93% of Maine's communities participate in the National Flood Insurance Program.
    - 83.7% of Maine's municipalities participate in the NFIP
- 21 Maine communities now participate in the Community Rating System (more than any other New England state)
- Over 425 communities are assisted with technical assistance annually
    - Over 2,225 individually logged assistance contacts annually
- Close to 300 individuals attend Maine Floodplain Management workshops annually
- Handbook updated annually
- Website updated on demand: www.maine.gov/spo/flood/
    - Web based Best Available Date for Unnumbered A Zones
    - 5 model Floodplain Management Ordinances (based on level of mapping) maintained on website
    - Links to important forms and reports and publications
    - Model permits and decision tree on line
- 2,704 flood map panels in effect
- 19 years is the average age of a Flood Insurance Rate Map in Maine.

With 5,299 miles of coastline in Maine and 2,772 square miles of floodplain, flooding in Maine is inevitable. This flooding, largely the result of coastal storms, heavy spring rains, runoff, and ice jams, has been responsible for millions of dollars of property damage. No private flood insurance is available to insure property against loss from floods; private insurers have found the risk too high. In rare instances some companies will provide flood coverage for mobile homes and for some non-residential use. Those rates are usually very high and not always available.

Assessment of Progress

SPO continues to work with towns one-on-one to update their floodplain ordinances. As part of the MFMP Community Assistance Program Funding with FEMA (CAP/SSSE) it prepares a performance based work plan. Maine's Program has been very effective in accomplishing its goals. Over the years the staff has assisted communities with upgrading their ordinances. By looking at the percent of communities with compliant ordinances, we have gone from only 27 percent with compliant ordinance in 1995 to 77 percent for the last documented federal fiscal year of 2006 that ended on September 30, 2006. Most of those with non compliant ordinances are the towns with 1987 language that does not reflect FEMA/NFIP regulatory changes in 1989 that added definitions for Historic Buildings, Recreational Vehicles, Substantial Damage, and language changes to the definitions of Substantial Improvement and Start of Construction. There have also been numerous changes to the model ordinance language to clarify minor permit development and allow better administration of the ordinance.