



VOLUME 9, NO.33

NEWSLETTER

AUTUMN 1991

WHAT CAN WE DO WITH FLOOD WATER ?

(Excerpted from Debris Line)

In the small Texas town of Dell City, approximately 90 miles east of El Paso, flood waters will soon be used in an unusual way.

Dell City is located in a valley which is occasionally flooded. The lack of natural drainage into the river prevents normal runoff and results in swift flows and heavy flood losses. Due to heavy agricultural uses of ground water within the area, ground water levels are falling.

Considering both the flooding problem and the need for ground water recharge, the Department of Agriculture/Soil Conservation Service is participating in the development of a unique system designed to control the flooding and recharge the ground water. In this system flood waters are trapped behind a series of dams. With no rivers in the area, however, the releasing of the flood waters in the normal manner could still cause flood damages. The release in the normal manner would not address the issue of falling ground water levels. In order to address these issues, the Department of Agriculture plans to develop a series of recharge wells immediately downstream of each of the dams. Flood waters which flow into the reservoirs during the storms would then be released and directed into the wells thus providing both flood protection and much needed ground water recharge.

Approximately 11 of the recharge wells had been constructed by the end of 1990 and designs were being completed for the development of the conveyance system that will transport the released flood waters to the wells. When completed, the system will provide flood protection and as much as 6,000 acre feet of fresh water recharge into the aquifers each year. The actual recharge amount will depend on the rainfall in the area. The recharge will not only be beneficial to the ground water levels, but will also decrease the salinity of the ground water supplies which will be an added benefit to crop production of crops irrigated with the ground water from aquifers within this area.

Identification of the values of flood water and working to take advantage of these values should be a major effort within the area of flood water and watershed management.

REMEMBER

Your community receives one copy of this Newsletter. Please circulate to all key personnel with responsibilities in Floodplain Management or Emergency Management.

**COMMUNITY RATING SYSTEM:
ELEVATION CERTIFICATE
REQUIREMENTS**

(Excerpted from Flash Flood News, North Carolina)

In order for a community to participate in the Community Rating System (CRS), it must agree to use FEMA's Elevation Certificate (FEMA Form #81-31) and make copies available to any inquirer. The community must begin using the forms when it applies for participation in CRS. After the community's Chief Executive Officer certifies in the application that it is doing this, the community will automatically receive 56 points for EC (the acronym for Elevation Certificate credit).

During the community verification visit, the CRS specialist will review a sample of elevation certificates for accuracy. The following table lists those items which are included in the review.

Elevation Certificate Verification Items

- Section B.
 1. Community Number
 2. Panel Number
 4. FIRM index date
 5. FIRM Zone for the location
 6. Base Flood Elevation for that location
- Section C.
 1. Building Diagram
 2. Floor or reference point
 5. Form based on actual construction
- Section E.

Form signed by a registered professional engineer or land surveyor or architect.

A similar review would be conducted for floodproofing certificates (FEMA Form #81-65).

The credit for maintaining elevation certificates, EC, will be adjusted based on the number of certificates with no errors, the number of certificates with one deficiency and the number of certificates with two or more deficiencies. For example: if 12 elevation certificates were reviewed, eight forms were correct, three had one deficiency and one had two or more deficiencies; the points for this element would be reduced to 42. If the community only had one elevation certificate to review, one deficiency would reduce the points 50% (28 points). If the verified score was found to be less than 28 points (i.e., less than 50% of the element being correctly implemented), the score for EC would be zero. Because this is a required element, the community would face a loss of all CRS credit effective on the following October 1st.

Community officials and land surveyors are urged to begin using FEMA's Elevation and Floodproofing Certificates. These are available at no charge and can be ordered by writing to:

NFIP Form Order Unit
P.O. Box 499
Lanham, MD 20706

It is imperative that land surveyors and floodplain managers work together to ensure that there are no deficiencies on these certificates. Both professions will benefit from the quality of work.

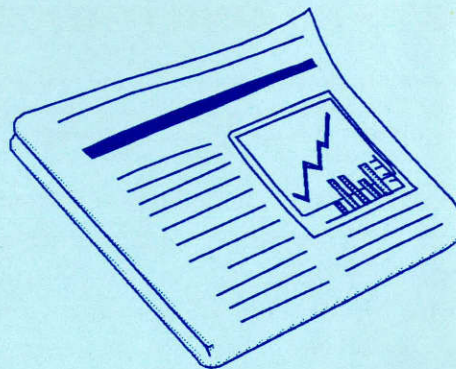
(Additional information about Elevation Certificates is located elsewhere in this newsletter.)

HURRICANE BOB RAKES ATLANTIC COAST

(Excerpted from Weekly Climate Bulletin)

Tropical Storm Bob developed from a tropical depression just northeast of the Bahamas on Friday, August 16, 1991, and strengthened to hurricane forces on Saturday as it moved northwestward. The hurricane then turned to the north and grazed the North Carolina Coast. The eye of the storm missed Cape Hatteras, NC, by 40 miles, bringing over five inches of rain and 70 mph wind to the Outer Banks Sunday evening while the storm center, out at sea, packed sustained winds of 115 mph. Thunderstorms accompanying the hurricane spawned several tornadoes along the North Carolina coast. Bob then raced rapidly northeastward, causing some minor flooding along the mid-Atlantic coast with heavy rain and high surf. Near mid-day Monday, the storm passed over Block Island, RI, and into eastern sections of Rhode Island and Massachusetts, causing considerable damage with winds gusting to 120 mph and torrential rains of three to six inches. The storm slowly weakened below hurricane strength as it moved through Maine and into Canada on Tuesday, drenching portions of southeastern Maine with over seven inches of rain.

Massachusetts suffered the most damage, nearly \$200 million, followed by Rhode Island, \$9 million, and New Hampshire, \$1.1 million. At press-time Hurricane Claudette and Tropical Storms Danny and Erika were identified in the Atlantic Ocean but had not yet approached a land mass.



NEW FEMA PUBLICATION AVAILABLE

The Federal Emergency Management Agency has published a new floodplain management aid entitled "Answers to Questions About Substantially Damaged Buildings." The document (FEMA-213/May 1991) is part of the National Flood Insurance Program's Community Assistance Series. The purpose of the document is to answer questions regarding NFIP regulations and policies governing substantially damaged structures. The 'answers to questions' format of the booklet is designed to provide guidance to floodplain managers who oversee the issuance of development permits in their community. This publication provides good information on two of the more difficult to administer concepts in floodplain management; substantial improvements and substantial damage.

The publication may be ordered by writing: FEMA, Box 70274, Washington, D.C., 20024

WHAT'S COMING FOR NFIP?

A report of the proposed amendments to the National Flood Insurance Program as prepared by the Association of State Floodplain Managers, Inc.

For nearly two years, the Policy Research & Insurance Subcommittee of the House Committee on Banking, Finance & Urban Affairs has investigated a variety of opportunities to strengthen the NFIP. Ten hearings were held to provide federal agencies and outside interest groups the opportunity to address concerns and to offer solutions. The Association (ASFPM) was invited to testify on four occasions.

On May 1, 1991, the U.S. House of Representatives passed H.R. 1236, the National Flood Insurance, Mitigation and Erosion Management Act of 1991 by a vote of 338 to 18. Major provisions of the bill are as follows:

Flood Mitigation Program

- ◆ Establishes an Office of Mitigation Assistance within FIA.
- ◆ States are eligible for grants for mitigation projects and providing planning and technical assistance to communities.
- ◆ Communities are eligible for grants if they have mitigation plans and (1) are proactive/exceed minimum NFIP standards (including erosion management if designated as erosion-prone); (2) have suffered \$250,000 in non-infrastructure flood damage within past 12 months; or (3) have suffered recurring flood damage and claims.
- ◆ Individuals are eligible for grants if they have had flood insurance for a minimum of two years and have suffered insured flood damage since December 31, 1977. Projects must be consistent with state and local land-use and hazard mitigation plans.
- ◆ Eligible mitigation activities must be technically feasible and cost effective, including but not limited to acquisition, elevation-in-place, relocation, and flood-proofing.
- ◆ Current Section 1362 activities are folded into a comprehensive mitigation program, with transition provided.
- ◆ Grants are 75% federal and 25% state/local funds. Matching funds are defined to include materials, time and salary, donated time and services.
- ◆ Capable states may seek delegation of certain authorities.
- ◆ Creates National Flood Mitigation Fund by assessment of a \$5 mitigation surcharge per policy term, and including unexpended 1362 funds and penalties assessed on noncompliant lenders.



- ◆ Provides for a transition period, and implementation of a mitigation pilot program, prior to issuance of final regulations.
- ◆ Repeals Section 1362, with provision of transition period.

Erosion Zone Management

- ◆ Requires development of regulations and implementation of a program to reduce coastal erosion hazards along the U.S. coastal waters and Great Lakes shorelines.
- ◆ Using available data, provides for identification of erosion-prone areas.
- ◆ Establishes minimum setbacks for the 10-,30-, and 60-year erosion zones.
- ◆ Establishes minimum land-use restrictions within erosion zones, including restrictions on relocated buildings, new construction and substantial improvements, and provisions for movability of certain new construction.
- ◆ Requires communities identified as erosion-prone to adopt minimum land-use standards in order for citizens to be eligible for mitigation benefits.
- ◆ Provides mitigation assistance to certain eligible structures threatened by imminent collapse.
- ◆ Mitigation assistance available for relocation of buildings, or if

relocation is unsafe or more costly, allows demolition (up to 40% and 100%, respectively, of the lesser of the value of the structure or insurance coverage.

- ◆ Owners who fail to relocate/demolish within 24 months will be penalized by a one-time limitation of 40% of the value followed by cancellation of the policy.
- ◆ Denies flood insurance on new and substantially improved structures built in violation of erosion management standards.
- ◆ Limits availability of flood insurance to structures relocated landward of appropriate setbacks.
- ◆ Provides for increasing the chargeable premium flood insurance rates in communities designated as erosion-prone but that choose not to adopt erosion management standards.
- ◆ Repeals Section 1306 (c), "Jones/Upton" with provisions for transition in coastal and riverine areas.
- ◆ Authorizes \$5 million/year for erosion mitigation assistance.
- ◆ Authorizes FEMA to conduct a study to determine the feasibility of identifying and establishing erosion rates in riverine areas, and to analyze management strategies that may be applicable.

Lender Compliance

- ◆ Clarifies that lenders and federal agencies may not waive the mandatory flood insurance purchase requirements.
- ◆ Extends to all lenders the requirement to require borrowers to purchase flood insurance.
- ◆ Requires lenders to perform complete portfolio reviews, unless already conducted recently with high level of compliance, and to assure that all loans secured with flood-prone improved property are adequately insured.
- ◆ Allows lenders to charge the borrower up to 50% of the costs of making a floodplain determination on outstanding loans.
- ◆ For residential real estate loans, requires lenders to establish escrow accounts where the lender is already escrowing other charges, such as homeowners insurance and taxes.
- ◆ Imposes a \$350 fine for each failure to require flood insurance, with an aggregate annual penalty not to exceed \$100,000 per lender.
- ◆ Requires development and usage of a Standard Hazard Determination Form to include map and panel numbers, flood zone, and date of map.

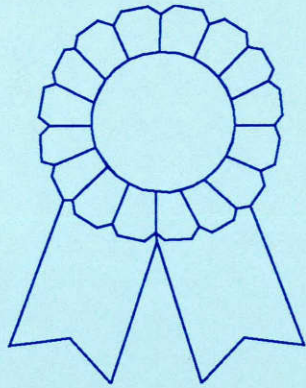
Natural and Beneficial Floodplain Functions

- ◆ Includes "encouraging state and local governments to protect natural and beneficial floodplain functions that reduce flood-related losses" under the NFIP declaration of purpose.
- ◆ Defines Natural & Beneficial Floodplain Functions.
- ◆ Specifically authorizes additional Community Rating System credits for communities that implement measures related to protection of natural and beneficial floodplain functions.

Additional Provisions

- ◆ Authorizes the Community Rating System, provides funding from the National Flood Insurance Fund, and requires biennial reporting to Congress.
- ◆ Creates a Flood Insurance Inter-agency Task Force.
- ◆ Increases maximum available coverage for all structures, e.g., from \$185,000 to \$250,000 for single family residential buildings.
- ◆ Provides for assessments every five years, of the need to revise and update Flood Insurance Rate Maps.

The Senate Subcommittee on Housing and Urban Affairs of the Senate Banking Committee will hold hearings on the Bill in mid-September.



1991 TFMA CONFERENCE: ANOTHER SUCCESS

It was a long trip for many members of the Texas Floodplain Management Association (TFMA) who gathered in San Angelo on April 9, 1991, for their Third Annual Conference. For many it was also their first trip to San Angelo, but everyone pledged it would not be their last. The physical beauty of the Concho River Valley, the historic sites such as old Fort Concho and Miss Hattie's, and the hospitality of the West Texas people, all combined to totally charm the attendees. San Angelo is an oasis in an otherwise arid area. The North, South and Middle Concho Rivers all come together at San Angelo and flow on to the east as the Concho River. Two large reservoirs just west of town, O.C. Fisher Lake and Twin Buttes Reservoir, provide a dependable water source for the area as well as flood control.

TFMA once again created an excellent program combining professional presentations on floodplain management subjects with field trips to flood mitigation projects, all complemented by exceptional social activities hosted by Wayne Farrell and his staff from Tom Green County, and Will Wilde and his staff from the City of San Angelo.

The conference agenda included presentations by:

Federal Emergency Management
Agency (FEMA)
U.S. Army Corps of Engineers
Texas Water Commission
National Weather Service
Soil Conservation Service
Tom Green County
City of Longview
KTBC-TV of Austin

A special training session for new Floodplain Administrators and a TFMA Business Meeting completed the three day conference.

FLOODING SAFETY RULES

GET OUT of areas subject to flooding immediately!

NEVER try to cross a flowing stream on foot if the water is near your knees.

DO NOT attempt to drive through water of unknown depth. If your vehicle stalls, abandon it! Rapidly rising water of just over one foot can sweep your vehicle and its occupants away.

AT NIGHT be especially careful since it is much harder to see flooding dangers.

NEVER CAMP on low ground where a flash flood can catch you while you sleep.

STAY INFORMED as much as possible and be ready to move to safety when the need arises.

NEW CRS INFORMATION

The following articles were extracted from NFIP/CRS Update Summer 1991 edition. That issue also included analysis of the 1990 applications for CRS with discussion of the most common errors made by communities in preparing their applications and documentation. Due to space limitations, we could not include the analysis in this newsletter. Interested communities may order the issue from the address below.

Statement of Purpose

NFIP/CRS Update is an official publication of the National Flood Insurance Program's Community Rating system. Its purpose is to provide local officials and others interested in the Community Rating System with news they can use.

NFIP/CRS Update is printed whenever it's needed. It is sent free to local officials, state officials, consultants, and others who tell us that they'd like to be on the mailing list. However, to keep costs down, we must limit subscriptions to one per community.

To become a subscriber or if you have a topic that you would like addressed, write:

NFIP/CRS Update P.O. Box 501016 Indianapolis, IN 46250-6016

New Repetitive Loss Provisions

The 1991 Commentary will make it easier for communities with a small number of repetitive loss properties to participate in the CRS. A community with one or more repetitive loss properties on the FEMA printout would have to submit the following with its first year's application.

1. A description of the errors on the printout (e.g., properties outside the community),
2. A map with the FEMA printout properties plotted and the repetitive loss areas identified,
3. A description of the causes of the repetitive flooding, and
4. A certification from the chief executive officer that the residents of the repetitive loss areas (not just the properties on the FEMA printout) will be sent information on flood protection measures each year.

If the printout (after correction) has 9 or fewer properties, the community need do nothing more for this activity. The community would be considered as having fulfilled the CRS' repetitive loss requirement, but no credit points would be granted. Communities with 9 or fewer properties on the FEMA printout that applied in 1990 with the alternative repetitive loss documentation need only submit the Chief Executive Officer's certification with its 1991 recertification.

Communities with 10 or more properties on the FEMA printout must have a repetitive loss plan adopted and submitted by December 15 of the next year. Any community may voluntarily submit a repetitive loss plan and re-

ceive credit under this activity. However, it must show that it has a repetitive loss problem.

To receive credit under Activity 510, the credited elements must be supported by the plan and be related to reducing the repetitive losses. For example, a community flooded by a large river or the ocean, may not receive repetitive loss credit for drainage system maintenance.

Recertification

A reminder: Each year, a Class 1-9 community must recertify that it is continuing to implement the activities for which credit has been provided. It is due to the FEMA Region office no later than December 15.

As noted in their credit documentation sections, several activities have additional requirements that must be submitted with the annual recertification.

240 - Floodplain Management Plan and 510 - Repetitive Loss Plan: The annual progress reports.

610 - Flood Warning Program. An evaluation report if the community had been flooded during the previous year.

620 - Levee Safety: A certification by a registered professional engineer that the levee has been properly maintained.

A community may also apply for credit for new activities, drop one or more activities, or submit revised versions. However, before a modification is submitted, the community should check

that the additional credit points will be enough to change to a better CRS classification.

If there is a modification, a Notice of Application must be sent to the appropriate state and regional agencies. The modification is processed according to the same calendar described in Section 213 of the Commentary.

Application Worksheet AW-211 is used for the annual recertification. Modification must be noted on the form and new application worksheets for the modified activities must be attached. It must be signed by the Chief Executive Officer and the signature must be attested by the appropriate officer, usually the City or County Clerk.

NOTE: Modifications are not credited until they are verified with a verification visit. Therefore, modifications submitted on December 15, 1991, will not take effect until October 1, 1993. Only the initial Class 9 credit is awarded without a verification visit.

FLASH FLOOD WARNING

Move to higher ground immediately! Flash flooding is occurring in the specified areas.

FLASH FLOOD WATCH

Anytime conditions are favorable for flash flooding to occur, be prepared to move out of danger at a moment's notice.

General CRS References

Community Rating System Coordinator's Manual. August 1991. 300+ pages, consists of the CRS Commentary and the Application Worksheets. The Commentary is the primary document used by communities to apply for the Community Rating System. It includes the CRS Schedule and a detailed discussion of CRS application and verification procedures, the creditable activities, and calculation of credit points.

"Class 9 Quick Check", June 1, 1991. 4 pages. The "Quick Check" provides basic information for local officials to determine if their communities will have enough points to make Class 9.

"Introduction to the Community Rating System, A Summary of the Concept", August 1991. 8 pages. A brief description of the Community Rating System for distribution to elected officials, residents and others who want an overview of the program. It may also be used as source material for press releases.

"Activity Synopsis: Community Rating System", August 1991. 20 pages. The Activity Synopsis introduces the CRS and the credited activities but does not include scoring data and formulas.

"Computerized Application for the Community Rating System, 1991" (to be published November 1991). A stand-alone software program which guides data entry and calculates credit points. A disk with data entered using this program may be used in lieu of most of the Application Worksheets for December 15, 1991, CRS Applications. Requires IBM compatible PC.

"User's Guide for Computerized Application for the CRS" (to be published November 1991). Instructions on the use of the program, "Computerized Application for the Community Rating System, 1991". A copy is provided with the program.

References on Specific Activities

240 - "Example Plans", August 1991. 50+ pages. A revised version of the 1990 version, updated to reflect the 1991 Commentary. Includes a discussion of the requirements for credit for the Floodplain Management Plan (Section 240) in the Commentary and the Repetitive Loss Plan (Section 510) and examples of both.

310 - "Computerized Format for FEMA Elevation Certificates" (to be published November 1991). A program for entering and retrieving data from FEMA Elevation Certificates. Meets the requirements for credit for ECCF in Activity 310 of the Community Rating System.

450 - "Community Rating System Credit for Stormwater Management" (to be published October 1991). 20+ pages. Includes a discussion of the requirements for credit under Activity 450 - Stormwater Management in the Community Rating System Commentary and a model flood warning program.

610 - "Community Rating System Credit for Flood Warning Systems" (to be published October 1991). 20+ pages. Includes a discussion of the requirements for credit under Activity 610 - Flood Warning Systems in the Community Rating System Commentary and a model flood warning program.

Special Flood-Related Hazards: "Community Rating System Commentary Supplement for Special Hazards Credit", August 1991. 30 pages. A supplement to the Community Rating System Commentary which must be used by communities which wish to apply for credit for management of the seven special hazard areas (alluvial fans, closed basin lakes, coastal dunes and beaches, ice jams, moveable bed streams, mudflow hazards and subsidence). There are additional background papers on all but the sand dunes and mudflow hazards.

*All of the materials on this page are free. Order copies from:
Flood Publications, NFIP/CRS, P.O. Box 501016, Indianapolis, IN 42650-1916
It is requested that a community order only one copy of a document so it can review it before ordering more. If more than 3 copies of a document are desired, please include a brief explanation of their use.*

Changes in the 1991 Commentary

There have been several changes made to revise the 1990 Commentary for 1991. These changes resulted from field testing of the 1990 Commentary, comments from 1990 applicants, and reviews of the 1990 applications and verification visits. The vast majority of these changes were made for the sake of accuracy, clarification, consistency and appearance. The few substantive changes in CRS credit for 1991 are as follows:

1. Maximum credit for management of five of the special hazards in Activity 430 - Higher Regulatory Standards was increased from 35 points to at least 115 points. This change affects alluvial fan hazards, closed basin lakes, ice jam hazards, moveable bed streams and areas subject to land subsidence. Credit for management of coastal dunes and beaches and mudflows is unchanged since 1990. All discussion of credit for mapping and managing special hazards is now included in a separate publication (see article, page 10).
2. Communities may now apply for a default value of 25% for the areas of their watersheds affected by Activity 450 - Stormwater Management.
3. As explained in the article "New Repetitive Loss Provisions", there are new provisions for Activity 510 - Repetitive Loss Projects.

4. The maximum credit for Activity 620-Levee Safety was increased from 120 points to 900 points. Previously a community with a levee that protected more than one property could apply for credit under both Activity 620 and Activity 530 - Retrofitting. Under this new version, all credit for such levees is covered in Activity 620.
5. Maximum credit for Activity 630-Dam Safety was increased from 95 points to 130 points. This change reflects the development of criteria for crediting state dam safety programs.

FEMA Elevation Certificate

One common problem with CRS applications is that many communities are not keeping records on the FEMA Elevation Certificate. As noted in the CRS Schedule, this is a requirement under Activity 310 - Elevation Certificate for a CRS Classification:

Activity Description:

In order for a community to participate in the CRS it must agree to use the certificate and make copies readily available to any inquirer. The Community may request to use a form equivalent to the Elevation Certificate (e.g., a similar document on computer) in lieu of the FEMA form.

In the past, FEMA and the State NFIP Coordinators have visited communities and reviewed their elevation record keeping systems. Many communities have been told that their systems and forms were acceptable. However, such forms were acceptable only for the purpose of meeting the minimum regulatory requirements of the NFIP.

Many communities have not started using the FEMA Elevation Certificate because they felt that since FEMA approved the forms for local record keeping, that they were approved for CRS purposes. This is not the case. The CRS requires a form that is the same or very similar to the FEMA Certificate because it is also used for insurance rating purposes.

If the community does not use a form that includes all of the information on the FEMA Form, it will not be accepted for CRS purposes. As noted in the

Commentary, communities are encouraged to submit their forms to their FEMA Regional Offices as soon as possible to confirm that their system is acceptable for CRS purposes.

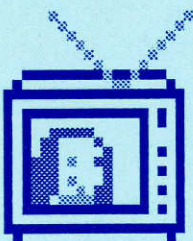
If a local form is not accepted, communities may easily transfer the data to the FEMA Certificate. If the original building elevation was certified by a surveyor or engineer, the FEMA certificate can be signed by a local official who is not a registered surveyor or engineer.

BEST BUILD VIDEO SERIES

The Federal Emergency Management Agency (FEMA) and the National Association of Home Builders (NAHB) have jointly produced a series of video tapes called Best Build that provide assistance to both the builder and the homeowner when building homes in floodprone areas. There are now three videos:

- ◆ **Best Build I:** Constructing a Sound Coastal Home covers the flood related forces and construction details that need to be understood when designing and building a home along the shore. The video provides several examples of construction techniques that are suitable for a coastal environment.
- ◆ **Best Build II:** Construction in a Riverine Floodplain describes the flood forces and conditions that should be examined prior to building a home in a river or stream floodplain.
- ◆ **Best Build III:** Protecting a Floodprone Home. This recently completed video addresses various techniques that homeowners can use to floodproof or retrofit their homes to reduce future flood damages. The techniques covered include real life examples from all over the country.

You may purchase any of the Best Build series for \$10.00 for each VHS tape by sending payment payable to:



NFIP Best Build Series
P.O. Box 710
Lanham, MD 20706

FAILING DAMS AND LEVEES ARE A NATIONAL PROBLEM

(Excerpted from The New York Times, article by Peter Applebome)

"Everybody's insurance was the levee, and it's gone", lamented a resident of Elba, Alabama, which was largely under water after flood waters ripped through the town's 52-year-old levee in March, 1990. The flooding in Elba and throughout much of Alabama, Florida and Georgia killed 11 people and caused untold millions of dollars in property damage. Its underlying message, however, may have been that the nation's aging dams and levees do not always provide the protection Americans have come to expect. At the least, experts say, the nation's 80,000 dams will cost more and more to maintain. And some experts complain that some large flood-control projects are as much a product of politics as a physical necessity.

For three decades, planners, environmentalists and government agencies have tried to limit development in flood-prone areas. Yet during that time, according to one Government study, the national percentage of dwellings located in areas subject to flooding increased from 10 percent in 1966 to about 14 percent now. The catastrophic flooding in Elba destroyed or damaged 600 homes and virtually all downtown buildings and drove half the residents from the town of 4,400. The disaster reflected just how vulnerable development in designated flood zones or in places like Elba, considered safe because of man-made barriers, can be. The problem concerns not only those living in such places, the vast majority of whom lack flood insurance, but also

government bodies, which can face enormous expenses for rebuilding and maintenance.



Costliest Natural Hazards

The Federal Government has spent \$20 billion on dams and levees in this century. In the past decade, annual flood damage ranged from \$500 million to \$6 billion, making floods the nation's costliest natural hazard. "It becomes a bigger issue all the time, because there's just so much more property at risk", said William Riebsame, director of the University of Colorado National Hazard Center, which studies human responses to natural hazards. "Americans don't like to be told what to do with their property."

On one level, what happened in Elba was simply an unpredictable act of nature. The 3.2-mile-long earthen levee running along the Pea River was too low to protect the town from record flood waters caused by 16 inches of rain in two days. The river surged over the levee, which is from 15 to 20 feet high. "We just got a flood bigger than anyone ever dreamed of", said E. Patrick Robbins, a spokesman for the Army Corp of Engineers in Mobile, the

agency that inspects the system protecting Elba. The Works Progress Administration built the levees in 1938 after a flood in 1929 inundated the town. But with so many flood-control projects older than 40 years, worries go beyond the unpredictability of nature. Experts say some older projects, built when flood baselines were less accurate than today's data, may not accurately reflect true flood hazards. More important, aging dams need more maintenance. "You've got all these 50- to 100-year-old dams, and a lot of them are in bad, bad shape", said Larry Larson, executive director of the Association of State Floodplain Managers and chief of floodplain management for Wisconsin.

Re-routing Rivers

Some critics say that the government has contributed to increased flood damage by subsidizing unwise development. Moreover, they contend that the redirection of rivers and the destruction of wetlands accompanying many water projects have worsened flooding by removing many natural brakes. "Our nation's flood-damage bill continues to grow because we're still financing a pork-barrel system where we're encouraging disaster by building structures that lull people into a false sense of security", said Brent Blackwelder, vice president of the Friends of the Earth Foundation, an environmental group with offices in Washington.

True or not, ever since the first levee was built in low-lying New Orleans in 1727, much of the country's growth, particularly that of the Mississippi River Valley, has depended on flood-control projects designed to protect homes and farmland. Once built, such structures cannot be abandoned. Army

Corps officials contend that their projects have prevented \$11.7 billion a year in flood damage over the past decade. "If you go way back, people settled along the rivers, where the transportation system was", said Carol S. Todd, a spokeswoman for the Army Corps of Engineers in Washington. "You'd have to move out of New Orleans if you didn't have some structural solution."

For decades, critics of huge water projects have been calling for alternative approaches to flood control, tighter limitations on building in floodplains, for example, and construction standards that take into account the possibility of heavy flooding. Some experts credit the Army Corps of Engineers and other water-project agencies with finally moving in that direction. "I think the agencies have changed", Mr. Riebsame said. "They've gone to a much more broad definition of what it means to reduce flood hazards." Yet change is slow. "It's like kicking a dinosaur in the rear end", he said. "The message gets through slowly."

Few programs intended to reduce building in flood-prone areas have worked entirely as planned, largely because of development pressures. The National Flood Insurance Program, for example, was planned as a way to require Federal flood insurance for the most vulnerable property owners in return for local government policies regulating development in flood-prone areas. But some communities have merely paid lip service to such restrictions. In addition, a 1987 study by the Federal Emergency Management Agency found that only about 14 percent of residences in flood-hazard zones have flood insurance. Similarly, other alternatives have been

phased out or not provided with financing by Congress.

"Congress still views the Corps as their construction agency to bring something for voters back home", Mr. Larson said. But the era of the big-ticket item may well be dead. Since 1984, the Army Corps of Engineers has spent more money maintaining old projects than building new ones. The issue will continue to haunt governments, particularly local ones, which bear much of the maintenance bill. "The problem with dams is once you've built them, you have them forever", Mr. Larson said. "Someone has to take care of them."

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WEATHER PROVERBS

"Dogs and Cats eating the Grass, look for a Storm soon to Pass."

"Dew on the Grass, Rain won't come to Pass."

"Circle around the Moon, watch for Rain soon."

"Sea gull, sea gull, sit on the Sand...when you are close, the Storm is at Hand."

"Wild geese, wild geese, going to Sea...such fine Weather it will be."

"If the Acorn's Topped with Water, look for a Wet Winter to Follow."

"Thick Hair on an Animal's hide, a Harsh Winter does Betide."

"The Winds from the West suits everyone Best."

"When Stars shine Clear and Bright, get ready for a very Cold Night."

"Animals huddle Together, get set for Stormy Weather."

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