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STORM ON THE HORIZON:

THE NATIONAL FLOOD INSURANCE PROGRAM AND AMERICA'S COASTS

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September 1989

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EXECUTIVE SUMMARY

America's coasts are a national heritage. Thousands of miles of shore along the Atlantic, Pacific, Great Lakes and Gulf coasts form a delicate and beautiful merger of land and water. The coasts are also a tremendously rich resource. Coastal wetlands, according to the Fish and Wildlife Service (FWS), support roughly 70 percent of the nation's commercially important fisheries, as well as fish sought-after by recreational fishermen. Beaches and dunes shelter countless species of wildlife. And barrier islands act as the nation's front line of defense against storms, absorbing the drubbing of wind and waves.

But America's coasts are stressed: in some areas, nearly to the breaking point. Roughly 128 million Americans already live within 50 miles of a coast. Census reports show that coastal counties are growing faster than any other area in the United States. In too many instances, shoreline development places pressures on the fragile coastal ecosystem that are beyond its ability to absorb. The result can be seen in degraded coastal waters, fouled beaches, closed shellfishing beds, and the loss of wetlands.

According to the National Oceanic and Atmospheric Administration's (NOAA) shellfish register, nearly 50 percent of the nation's shellfishing areas are too polluted to produce edible shellfish. The culprits are primarily sewage and industrial discharges. Coastal wetlands are not faring much better. The FWS found that roughly half of the nation's coastal wetlands have disappeared, primarily from development. Some coastal waters are threatened by red, green and brown tides of toxic algae, fed by over-abundant nutrients that run off fertilized agricultural land. And beach closings continue to plague the nation, with shores on all four coasts subject to episodes of uncontrolled waste wash-ups.

In a look at pollution sources, the Oceanic Society found that 75 to 85 percent of marine pollution can be traced to land-based sources. Along with causing pollution, coastal land development puts shoreline homes and businesses in grave danger from hurricanes, storms, erosion and rising sea levels. Unwise coastal development also places at risk another critical resource: the federal Treasury.

In its 1988 "Digest of Federal Disaster Assistance Programs," the Federal Emergency Management Agency (FEMA) lists more than 50 federal programs that underwrite coastal development and redevelopment. These programs add up to literally billions of taxpayer dollars that support construction in the coastal zone. Amazingly, federal support is not limited to construction located at a safe distance from the water's edge. Federal dollars are pumped into development along the interface of land and sea that is both home to important fish and wildlife, and the

landing pad for hurricanes, storms, rising seas and erosion.

This area along the water's edge is in a constant state of flux. Wetlands, barrier islands, beaches and dunes advance and retreat in response to erosion, storms and water levels. But buildings cannot. The result is that as private development grows along this hazard zone, so does the public's exposure to loss because of the dangers of developing the coastal equivalent of the rim of the volcano.

One of the biggest of the 51 federal programs involved in coastal development is the taxpayer-funded National Flood Insurance Program (NFIP). Ironically, the Program was intended to, among other things, get development out of hazardous flood-prone areas. In 1968, Congress created the National Flood Insurance Program to try to end a vicious cycle. Shoreline communities were flooded, requiring massive federal disaster relief payments. Yet at the same time, the communities were not generating any special funds to at least partly reimburse the federal Treasury. And new development continued to go up in flood-prone areas.

In creating the National Flood Insurance Program, Congress offered a deal to communities in flood-prone areas: the federal government will sell homeowners low-cost, guaranteed insurance to cover flood damage (which will help cover the costs of disaster assistance) if, in return, the communities they live in guide new development out of the hazard area and enforce flood plain regulations (which will save money by reducing the need for massive disaster relief payments).

Thus, within the Program is a strong mandate for land-use management in the coastal zone. Although not intended originally as an environmental program, guiding development away from the productive and fragile land-and-water interface will help protect the coastal environment from the impacts of unwise shoreline development. And moving development out of the high-hazard zone will save taxpayer's money and lives.

But the land-use component of the Flood Insurance Program has been largely neglected and ignored. According to FEMA, more than \$5 billion worth of flood insurance policies are in effect in the high-hazard zone where land and water meet. In the past ten years, the Flood Insurance Program has paid-out \$500 million in claims for repeated damage to structures in the high-hazard zone along the water's edge.

Not surprisingly, FEMA's Flood Insurance Administration (FIA) admitted in a 1981 National Oceanic and Atmospheric Administration (NOAA) review that, "what is indisputable is that the NFIP has not restricted coastal development to any measurable degree."

The Program has also failed to, if not restrict development,

at least discourage it in flood-prone areas. Despite its mandate to "guide the development of proposed future construction, where practicable, away from locations which are threatened by flood hazards," development is booming in the hazard zones. According to FEMA, the number of households located in flood hazard areas has grown by 40 percent since 1966.

The result is that the NFIP has become the second largest domestic program behind the Social Security System. The Program has roughly \$170 billion in policies in force along the nation's coasts, rivers and lakes.

But while the Program is big, it is far from being financially stable or self-sufficient. The taxpayer has been intimately involved in the Program's finances since its inception in 1968. By 1980, FEMA had borrowed about \$854 million from the federal Treasury to run the Program. In fiscal year 1981, \$561 million was given by Congress to repay the prior years' borrowings. Annual appropriations continued until 1987.

One of the reasons money was needed was that NFIP premiums failed to cover loss payments for the ten year period of 1978-1987, resulting in a \$657 million deficit. FEMA points out that for the past two years, NFIP premiums have generated a small surplus in the National Flood Insurance Fund, helping to put the Program in the black for the first time in more than a decade. But the Agency also acknowledges that the past few years have been remarkably free of major hurricanes and storms: the events that trigger massive claims payment.

But if a year of major hurricanes or storms were to occur, the Flood Insurance Fund could not pay its bills. One catastrophic storm year, according to FEMA, could cause \$3.5-4 billion in damages to properties insured under the NFIP. On top of flood insurance claims, the insurance industry's All-industry Research Advisory Council would add wind damage claims which it believes could equal \$7 billion if a single major hurricane hit the heavily populated Gulf or Atlantic coasts. But the Flood Insurance Fund currently contains only \$500 million.

The difference between a half-billion fund and a \$7 billion price tag would be made up by the federal taxpayer.

The cost of unwise coastal development is thus threefold:

1. taxpayers are subsidizing development whose destruction from acts of nature will -- not might -- run in the billions of dollars;
2. coastal communities are expanding in the areas most susceptible to hurricanes, storms, rising sea level and erosion, placing millions of lives at risk from disaster; and,
3. coastal wetlands, beaches, waters and islands are suffering serious damage.

Steps need to be taken to address these costs. Step number one is to start using the Flood Insurance Program as the land-use management tool it was intended to be. To do this, communities must be required to keep their end of the deal, and start directing new development away from hazardous areas. Additional steps are required if the Flood Insurance goals of saving money and lives are to be met. Enacting and implementing these steps will require commitment from both FEMA, which implements the Program, and Congress, which oversees its success or failure.

The National Flood Insurance Program was intended to take steps to end the spiral of economically -- and increasingly, environmentally -- destructive coastal development. Instead, it has been implemented in a way to make it a "Spend and Mend" program that encourages development and redevelopment along the nation's thin and hazard-prone edge.

CHAPTER ONE

THE COST TO THE TAXPAYER

"High density development on west Galveston Island and the rest of the Gulf Coast is an invitation to disaster . . . It is a form of subsidized private leisure at public expense. It's unconscionable that taxpayers in the state of Texas should have to subsidize leisure property which is so vulnerable as to represent an uninsurable risk."

A.R. "Babe" Schwartz
Former Texas state senator and
representative, quoted in Insurance
Review, September 1986.

1962 and 1965 were bad years for flooding. Communities were ravaged, citizens killed, and families left homeless. Disaster relief assistance, funded by federal tax dollars, poured into the affected communities to help people and businesses get back on their feet.

But it concerned Congress that people were getting back on their feet in areas that had recently been knee-deep in water. The likelihood that communities that insisted on building and rebuilding in flood-prone areas would require repeated bail-outs seemed high. Moreover, these communities were not kicking money into the Treasury to help offset the massive disaster relief payments they received when they were flooded. The result was a spiral of expensive assistance, funded by the taxpayer, for uncontrolled development along the shores of America's coasts, lakes, rivers and streams.

Congress looked for alternative ways to deal with development in flood-prone areas. The idea of flood insurance was broached as a way to recover costs through the sale of policies. But private insurance companies refused to sell flood insurance for several reasons. According to the 1983 General Accounting Office (GAO) report, "National Flood Insurance Program: Major Changes Needed if it is to Operate Without a Federal Subsidy," one of the reasons that private insurers were

reluctant to offer flood insurance was simple: it was too risky. Selling flood insurance in areas prone to flooding set-up insurance companies for large-scale payments that the sale of policies would not cover.

So Congress looked to the federal government. Federally financed flood insurance had been briefly investigated in the late 1950s. According to the 1983 GAO report, an experimental program was created, but was never funded. However, the disastrous floods in the '60s changed the political climate. In 1968, Congress decided to take the plunge, and enacted the National Flood Insurance Act which created the National Flood Insurance Program (Public Law 90-448).

One of the four main goals of the National Flood Insurance Program (NFIP) was to move development out of the hazardous flood-prone areas along the nation's waterways. In this way, lives and mammoth federal expenditures could be saved. But instead of discouraging unwise development, the Program has become an essential cornerstone in a foundation of federal programs that support coastal development and re-development. Indeed, 82 percent of its policies are in force along the marine and Great Lakes coasts. And with roughly \$170 billion worth of policies outstanding, the NFIP is second only to the Social Security System in domestic liability.

But the Flood Insurance Program's greatest impact on coastal development may not be so much its size as the sense of financial security it gives shoreline developers. In a 1982 study, GAO concluded that although the NFIP was not the only factor affecting shoreline development, it provides developers with a financial safety net and, therefore, an incentive to develop in high-risk areas. This safety net is further bolstered by the other 50 federal development and redevelopment programs lodged in agencies as diverse as the Farmers Home Administration, Small Business Administration, the Army Corps of Engineers, and others.

If it were implemented as the cost and life-saving program it was originally intended to be, the Flood Insurance Program could be a powerful tool for better protecting the nation's coastal and economic resources. But as it is, the Program has become a blank check signed by the federal taxpayer: a check whose total, when erosion, rising sea levels, storms and hurricanes take their toll, will be in the billions.

I. THE NATIONAL FLOOD INSURANCE PROGRAM: ITS POTENTIAL AND PITFALLS

A. How the National Flood Insurance Program Works

The Administrator of the Federal Insurance Agency quipped at a May 1989 Congressional hearing that two forces encourage communities to join the National Flood Insurance Program: God and lenders. While the motivation for joining the Program may be up for debate, the goals it was to achieve are quite clear. The NFIP was to encourage state and local governments to make appropriate land-use adjustments to constrict the development of land which is exposed to flood damage" and "guide the development of proposed future construction, where practicable, away from locations which are threatened by flood hazards."

In its 1983 report on the Program, the GAO summarized the four main objectives the Program was to achieve:

1. Identify and map all flood-prone areas;
2. Make federally guaranteed insurance available to communities in those areas;
3. Promote state and local land-use controls to minimize flood loss and guide development away from flood-prone areas; and,
4. Reduce federal expenditures for disaster relief.

To accomplish these goals, the Federal Emergency Management Agency (FEMA) was put in charge of devising and implementing a national flood insurance program. FEMA drew up a series of steps that must be taken before an individual can buy a federal flood insurance policy. The following is a general "nuts and bolts" description of how the Flood Insurance Program works.

Participation: Participation in the Flood Insurance Program is on a community-wide basis. Individuals within a participating community can get federal flood insurance; those living in a community that is flood-prone, but has not decided to join the Program, cannot. The rationale for basing the Program on community involvement is simple. According to FEMA's 1987 "Questions and Answers on the NFIP" booklet, individuals alone cannot regulate the building industry or establish area-wide construction priorities. The community on the whole must act to avoid flood hazards if disaster to the whole community is to be avoided.

Community Assessment: To determine the flood potential, FEMA identifies and maps flood-prone areas. A community in an identified flood-prone area must assess its flood hazard potential and decide whether flood insurance and flood plain management would be to its benefit. Since participation in the Program is voluntary, communities can choose not to join.

Penalties: There are penalties if a community with flood

hazard areas decides not to join the Program. Federal agencies, like the Veterans Administration or the Small Business Administration, are prohibited from providing financial assistance such as loans or mortgages for buildings in flood-prone areas in identified flood-prone communities that have declined to join the Program. Perhaps most important, federal disaster assistance cannot be given to a community that knew it was flood-prone but failed to join the Flood Insurance Program.

These penalties are built into the Program for a reason. As FEMA states in its "Q & A" booklet, "the major purpose of the NFIP is to alert communities to the danger of flooding and to assist them in reducing potential property losses before a flood occurs, not after it is too late." Reducing losses is what the Program is all about. It was created to reduce the need for the government to step in and pick up the pieces after disasters in known disaster-prone areas strike. Denying communities certain federal funds until they take steps to protect themselves -- and the federal Treasury -- from costly damage makes sense.

Flood Insurance Rate Maps: Roughly 18,000 out of 21,000 eligible communities are in the NFIP. Each has a Flood Insurance Rate Map (FIRM) that FEMA has drawn-up for the community. The map shows where the most and least likely areas of flooding are. Insurance premium rates are based on the maps, so that someone choosing to build in the high-hazard zone will pay a higher premium than someone choosing to live in the areas of minimal hazard.

The Flood Insurance Rate Maps include different zones that correspond to different flood hazards. The most dangerous are the "V Zones," the areas along marine coasts subject to storm-driven waves. Next comes the "A Zone," or 100-year flood zone, which sets out an area where there is a one percent (or greater) chance of a predetermined flood level being met or exceeded in any given year. Because of their susceptibility to flooding, the V and A Zones are also referred to as the "Special Flood Hazard Area." NFIP regulations are only required for new construction in the Special Flood Hazard Area. Adjacent to the 100-year flood zone is the 500-year flood zone, where the chance of a flood level being met or exceeded drops to .2 percent. Finally, there are unstudied areas behind the 500-year zones where flooding is possible, but its probability unknown.

But these maps delineating the hazard areas and determining the cost of policies lack important information. First, the maps of these highly erodible areas do not include predicted erosion rates, even though erosion is a given in the ever-changing land and water interface. The maps should outline those areas predicted to erode over a given period, as calculated by

state coastal zone management officials and scientists. Second, the maps are similarly lacking when it comes to reflecting areas predicted to be inundated or affected by sea level rise. The National Academy of Sciences predicts a 2 1/3 foot global rise in sea level in the next century, while the Environmental Protection Agency believes a rise of 4 1/2 feet is more likely. Last, the maps are not required to be updated regularly so that changes caused by the forces of nature could be reflected. By ignoring erosion, sea level rise and other changes that occur over time, the maps fail to adequately reflect the geological processes of the coastal area. In turn, by not reflecting these processes, the maps do not reflect the true hazards of the coastal zone. This throws the cost of premiums in question, as the premiums are to cover the costs of damage likely to be caused in the insured area. It also casts doubt on the adequacy of current flood plain management activities that focus more on ways to make a structure "floodproof" than on ways to move development out of highly hazardous areas.

Although they lack important information, FEMA has used its maps to identify about 8 million structures that qualify for federal flood insurance. However, only 2.1 million flood insurance policies have been purchased. It is thought that the low individual participation rate in the NFIP would increase through enforcement of the requirement that those in designated flood hazard areas seeking federally-insured mortgages be required to purchase federal flood insurance. This too-often ignored requirement is known as the "mandatory purchase requirement."

Flood Plain Management: Once an area is mapped, flood plain management requirements are imposed. These can include elevating buildings to avoid potential flood waters, or requiring buildings to leave ground floors clear of development or enclosed with "breakaway" walls. While elevating a building can help it withstand some storms, the height of a structure does not make it resistant to erosion, rising sea levels or storm-driven winds of 135 miles per hour and above. Nor does it eliminate the environmental damage caused by shoreline development. Building up in a flood hazard area is no substitute for building out of the hazard zone. Yet by and large, the NFIP mandate to steer development out of the hazard zone has been interpreted as only requiring a set of building codes and other so-called "flood-proofing" steps.

Purchasing Flood Insurance: The Flood Insurance Rate Maps indicate if property is located in a flood-hazard area. If an individual does not need a federally-guaranteed loan or mortgage to build, he is under no obligation to buy a flood insurance policy for a structure in a designated flood-hazard area. If he

does need financial assistance backed by the federal government, he is required to have flood insurance. Those seeking aid backed by the federal government, or those who wish to participate in the Program, can buy flood insurance from a number of vendors: licensed property insurance agents, a broker in good standing with the state, or an agent representing a Write Your Own company specializing in flood insurance. The buyer or builder must make sure a new structure meets any elevation or building code requirements, as certified by licensed engineer, architect or surveyor. The insurance agent takes care of submitting the policy application, certifications and premium payment to the Flood Insurance Program.

There is evidence that lenders may be failing to meet their legal obligations. If a person seeks a federally guaranteed loan or mortgage against a structure in a community participating in the Flood Insurance Program, that person must buy flood insurance. It is up to the lender to notify the person of this legal requirement. However, the Administrator of the Federal Insurance Agency testified at a May 1989 Congressional hearing that many lenders are probably not advising purchasers that they need to buy flood insurance. This may keep the property owner from meeting flood plain regulations such as building codes and the like. In addition, uninformed flood plain property owners may not know their lack of flood insurance will prevent them from receiving most federal disaster relief assistance in the event of a disaster.

Policy Coverage & Cost: The policy term for NFIP is one year, or three years for policies under the Write Your Own Program. For a single-family dwelling, the policy will cover up to \$185,000 for the building, and \$60,000 for the contents. And for an amazingly low price: the average cost of a coastal flood insurance policy is \$262, according to a 1988 report by the GAO entitled, "Statistics on the National Flood Insurance Program." For a policy in the coastal high-hazard zone, the cost is only \$469.

B. The Financial Health of the National Flood Insurance Program

The Flood Insurance Program operated at a \$652 million deficit during the ten year period 1978-1987, according to the 1988 GAO "Statistics" study. FEMA points out that, during the past few years, the Program has managed to operate in the black. But this period has been remarkably free of hurricanes and major storms, and the damage they cause.

The history of the Flood Insurance Program is not one of financial stability. The insurance aspects of the Program are funded through a public enterprise revolving fund, which receives

income from: receipts from program operations, policy premiums, Treasury borrowings and Congressional appropriations. This is known as the Flood Insurance Fund. The Director of FEMA is authorized to borrow \$500 million from the Treasury without notifying Congress or going through the appropriations process and its Congressional debate and scrutiny. In addition, with the approval of the President, the Director of FEMA can receive an additional \$500 million for the Program, as long as Congress is notified.

Although the Program began in 1968, in little more than a decade this \$1 billion in borrowing authority was nearly exhausted, according to the 1983 GAO report on the Program. GAO points out that between 1970 and 1980, FEMA borrowed about \$854 million from the federal Treasury to run the Program. In Fiscal Year 1981, roughly \$228 million had been earned through the sale of policies, and deposited in the National Flood Insurance Fund. However, in that same year, more than twice what was earned -- \$561 million -- was appropriated by Congress to repay prior years' Treasury borrowings. At the same time, another \$64 million was borrowed to help run the Program. Even in 1986, when the Program was supposed to be operating on a sounder financial basis, Congress appropriated \$37.9 million for the Flood Insurance Fund.

Appropriated dollars come from the pockets of taxpayers. So does money borrowed from the federal Treasury. Expenditures of this magnitude -- nearly \$1 billion borrowed and \$600 million appropriated -- require, at the least, strict oversight to ensure that the public's money is being wisely spent. One common method of oversight is through the Congressional appropriations process, where proposed expenditures, as well as previous years' expenses, are scrutinized by the elected lawmakers. But although it has historically borrowed massive amounts of taxpayer dollars, FEMA is not required under law to regularly request appropriations to repay its borrowings. Consequently, the GAO concluded in 1983 that "this lack of a regular requirement to request appropriations to repay borrowings has reduced the ability of the Congress to oversee the Flood Insurance Program."

The Flood Insurance Program's historic financial instability is not likely to lessen in the future. As development grows along the coast, so does the potential for massive destruction from storms, hurricanes and the like. Predictions of potential damage caused by hurricanes hitting the heavily populated coasts run in the billions. The past few years -- the only time the Program has operated in the black -- have been blessedly free of such catastrophes. With only \$500 million in its Fund, the Flood Insurance Program is ill prepared to cover the costs that would ensue from dramatic acts of nature. And as long as the Program

continues to fail to guide planned development out of the high hazard area, coastal development will continue to be a costly ticking time bomb.

C. The National Flood Insurance Program's Success in Meeting Its Goals

By and large, the Flood Insurance Program has failed to meet what is arguably the most important of its four objectives: promote state and local land-use controls to minimize flood loss and guide development away from flood-prone areas.

During a review of the Program in 1981, the Flood Insurance Administration acknowledged that it was "indisputable" that the NFIP has not restricted coastal development "to any measurable degree." In 1989, FEMA's own statistics corroborate this failure. Along the high-hazard "V Zones," those areas subject to storm-driven wave action, 64,000 flood insurance policies are currently in force.

Back in 1982, the GAO recommended to Congress that it "reconsider whether it is desirable public policy to continue providing flood insurance" in the highly hazardous V Zones in light of the "unavoidable potential for loss of life and destruction of property in these areas." Yet development has continued in these areas.

Claims on flood insurance policies in force in the high-hazard V Zones have been significant. The area in the flood plain with the highest average loss is the coastal high-hazard area. According to the 1988 GAO "Statistics" report, which examined the Program's activities from 1978-1987, the average loss on a flood insurance policy in marine coastal areas was \$6,907. Great Lakes coastal areas suffered an average loss of \$3,589 during this period. Yet the coastal high-hazard area accrued an average loss of \$8,260, testimony to the vulnerability of structures in high-hazard areas to damage from flooding and storms.

In its 1988 "Statistics" report, the GAO looked at the ability of the Flood Insurance Fund to cover claims from the current existing 2.1 million flood insurance policies. It concluded that one catastrophic storm year could amount to \$3.5-4 billion in losses on the existing NFIP policies. Yet the Flood Insurance Fund, at \$500 million, has less than one-quarter of that amount available for pay-outs.

The failure of FEMA to implement the land-use component of the Flood Insurance Program makes it very difficult for the

Program to achieve one of its other three major objectives: the reduction of federal expenditures for disaster relief. Shoreline development is a sitting duck for hurricanes, storms and other destructive acts of nature. Unlike non-participating communities, those in the Flood Insurance Program qualify for Federal Disaster Relief Assistance. Federally insured communities cluster at the water's edge along the hurricane corridor of the Gulf and Atlantic coasts, and the storm-prone areas along the Great Lakes and Pacific coasts.

II. OTHER MAJOR FEDERAL SUBSIDIES IN THE COASTAL ZONE

Some fifty other federal programs join the Flood Insurance Program in underwriting the development, redevelopment, repair and restoration of coastal communities. These programs are housed in agencies as diverse as the Federal Disaster Relief Agency, the Small Business Administration, the Farmer's Home Administration, the Department of Transportation, the Army Corps of Engineers, the Department of Agriculture, Health and Human Services, and many others.

The price tag for federally provided disaster assistance to flood-prone communities is already immense. According to FEMA, during the ten year period 1979-1988, federal government agencies spent \$6.5 billion for flood-related disasters. This amount is not surprising since FEMA acknowledges that from 1953-1985, roughly 90 percent of all federal disaster assistance declarations were for flood-related disasters.

Yet this price tag could grow. NOAA predicts that by the year 2000, average property losses from storms could reach \$5 billion each year. A 1986 report done by the insurance industry's All-industry Research Advisory Council goes one step further. The Council maintains that, because of the dense coastal population along the Atlantic and Gulf coasts, a catastrophic year with two major hurricanes could run up a \$14 billion tab in wind damages alone.

The total cost to the taxpayer of large-scale coastal development can be gauged by examining the costs of just a few individual storms. Consider the following:

- * On the night of August 17-18, 1983, Hurricane Alicia came ashore near Galveston, Texas, causing 3,243 injuries and 17 deaths. According to a National Academy of Sciences report on the hurricane, an estimated 2,000 homes or apartments were totally destroyed, while another 16,000 were affected by the storm. The Red Cross opened 111 shelters

that housed 25,000 evacuees. More than 2 million cubic yards of storm-generated debris were removed as part of the federal disaster assistance. The Small Business Administration made loans totalling \$29.1 million. The number of flood insurance claims submitted for payment: more than 14,000. The total cost of just these claims: \$119.1 million.

- * Not even a hurricane, but only a coastal storm, struck New Jersey and New York on March 30, 1984. The storm caused property damage, as well as eroding sand from public beaches, causing dunes to breach. Seawalls and boardwalks along New Jersey were damaged. The storm primarily struck Long Island and New Jersey's coast, although it caused heavy inland flooding. Both New York and New Jersey had federally declared disasters. Congress obligated \$15.7 million for disaster relief, but when the tab was calculated from all federal sources, along with state and local shares, roughly \$100 million was spent on New Jersey clean-up and restoration alone.

- * Hurricane Gloria hit mid-Atlantic and New England states on October 11-28, 1985. The Small Business Administration made 2,532 loans for \$30.6 million. According to FEMA, \$19.8 million worth of flood insurance payments were made on claims. Federal Disaster Relief Assistance was more than three times as high, totalling \$70.3 million in the following states:

New Jersey	\$ 4.0 million
New York	36.1 million
Connecticut	16.7 million
Rhode Island	5.3 million
Massachusetts	18.2 million

Conclusion

By failing to guide development out of hazardous, flood-prone areas, the Flood Insurance Program underwrites development that places people at serious risk from storms, hurricanes, erosion and rising sea levels.

By underwriting development in disaster-prone areas, the Program commits additional federal funds to a spider's web of

federal programs that commit tax dollars in support of coastal development and redevelopment.

And by supporting development in the fragile coastal zone, the Flood Insurance Program contributes to the degradation of coastal land and water caused by unwise shoreline construction.

The sum total of the failure to meet its legislated mandate will be monstrosly expensive, in terms of human lives lost, property destroyed and the environment impaired, when hurricanes, storms, erosion and rising seas eventually take their toll. But coastal residents will not foot this bill alone. The federal taxpayer, through the Flood Insurance Program and the other 50 federal programs active in the coastal zone, will be up to his neck in bills from damage to coastal communities he unwittingly currently supports.

CHAPTER TWO

THE COST TO THE COASTAL COMMUNITY

"Although [the 1985 Hurricane Elena] eventually made landfall 80 miles outside of Pinellas County, Florida, the resulting storm damages [in the county] included four deaths, 76 hospitalized, 395 injuries, 256 homes made uninhabitable with another 79,707 homes destroyed, and 252 businesses damaged or destroyed. An estimated 300,000 persons evacuated with 113,727 people using 70 Red Cross shelters. Nineteen nursing homes with 1,860 patients and three hospitals with 211 patients were evacuated."

Pinellas County Department of Civil
Emergency Services, "Evacuation in
Emergencies," FEMA, 1987.

During the past forty years, development along the fresh and saltwater coasts of America has exploded. Between 1950 and 1980, the coastal population grew by more than 30 million people. By 1986, coastal areas were growing in population at three times the rate of the rest of the nation. And demographers predict that by 1990, roughly 75 percent of the nation's population will live within 50 miles of a shore.

Remarkable for its growth, the past 40 year period is noteworthy for another reason: it has been relatively hurricane-free. For example, based on the experience of previous years, the National Hurricane Center predicted that 15 major hurricanes would strike U.S. coasts from 1960-1979. Only ten did so. From 1980 to 1988, severe hurricanes have been a rarity. Yet according to the National Hurricane Center, on average the United States is struck once every five years by hurricanes with wind speeds above 130 miles an hour.

While in recent history the coasts have been largely spared impacts from major hurricanes, other forces have taken their toll. Erosion from the ceaseless wind and waves has shrunk islands, consumed beaches, robbed dunes and gobbled bluffs. During recent record high water levels, shores along the Great

Lakes receded by the foot, placing small homes along with major metropolitan areas -- such as Chicago -- at risk. But the most astonishing rate of erosion occurs along Louisiana's shore, where a staggering 50 square miles of coast is lost each year from erosion, subsidence, development and other factors.

Some coastal geologists believe that sea level rise is causing coastal erosion rates to increase, particularly along the Gulf and Atlantic coasts. As heat is trapped below an atmospheric mantle of air pollutants, global air temperatures increase, causing the seas to rise as polar ice caps melt and the warmed ocean waters physically expand. Higher sea levels increase the water's inland reach, exposing more land to the eroding force of waves. Global warming could also further jeopardize coastal communities. Meteorologists are concerned that warmer air and ocean waters could breed more frequent and ferocious hurricanes, placing the heavily populated coasts further at risk.

While beautiful, living at the water's edge is clearly risky business. Risky for inland residents who, although they don't get the view, help foot the bill when disaster strikes disaster-prone coastal communities. And the risk to the coastal community is immense in terms of both lost property and lost lives. Indeed, it is the coastal dweller who increasingly puts his life on the line for his home on the shore.

1. Hurricanes and Storms

The state that 4,000 people move to each week is the most likely target for a hurricane: Florida. According to a report by NOAA's National Hurricane Center entitled "The Deadliest, Costliest and Most Intense United States Hurricanes of this Century," roughly 1 in 3 U.S. hurricanes strike the sunshine state. More ominously, the Agency reports that 2 of every 3 of the most deadly hurricanes -- the 130-plus mile per hour Class 4 or 5 storms -- will likely roll over Florida or Texas.

As a region, the Gulf of Mexico suffers the highest number of intense hurricanes. Not surprisingly, it also experienced half of the costliest U.S. hurricanes of this century, enduring almost \$10 billion in damages, according to the NOAA hurricane report. The savage storms carry a heavy human price tag, as well. More than 11,000 people have perished in the Gulf from hurricanes this century.

Though less likely to experience them than its neighbor to the south, the Atlantic coast also falls prey to destructive hurricanes. NOAA's hurricane report states that one of the five

most deadly hurricanes in U.S. history hit New England in 1938, claiming 600 lives. And 1972's Hurricane Agnes -- though only a Class 1 storm on the one-to-five ranking system -- is the second costliest hurricane in U.S. history. The northeast United States suffered more than \$2.1 billion in damages from Agnes.

The mid-Atlantic is not exempt from hurricane damages, either. The Ash Wednesday Northeaster of 1962 leveled the dune system along much of New York, New Jersey, Maryland and Virginia. According to FEMA, thousands of houses built on, in front of, and immediately behind the dunes were destroyed. Yet in its 1987 guidebook, "Reducing Losses in High Risk Flood Hazard Areas," FEMA notes that people continue to locate houses on dunes to "take advantage of the view and because their height above the water gives a sense, albeit false, of safety from flooding."

Despite the region's vulnerability to hurricanes, as of 1980, almost 80 percent of U.S. coastal residents from Texas to Maine had never experienced a direct hit by a major hurricane. Many of these residents moved to the coast during the preceding relatively hurricane-free 20 years. Thus, according to NOAA's National Hurricane Center:

"Stated simply, the areas of the United States where 9 out of 10 persons lose their lives by drowning from the storm surge during hurricanes (along the immediate Gulf of Mexico and Atlantic shorelines) are the very areas where the most dramatic increases in population have occurred in recent years."

Coastal communities along the Pacific are also vulnerable to storms, and to tsunamis, massive earthquake-related tidal waves. The FEMA 1987 report, Evacuation in Emergencies: An Annotated Guide to Research, cites the loss of millions of dollars, 500 homes and 61 people during a 1960 tsunami in Hilo, Hawaii. FEMA points out that communities in Alaska and California have fallen prey to tsunamis in the past 25 years, as well. Storms alone can be extremely dangerous, too. At a 1983 symposium called, "Preventing Coastal Flood Disasters," a California state official reported that a series of winter storms in 1983 damaged 3,000 homes and 900 businesses in communities along California's coast.

Communities along the Great Lakes are similarly subject to storms and seiches, storm-driven waves of enormous power. According to FEMA, waves driven by a 1950 storm on Lake Michigan moved a concrete cap on a breakwater at Gary, Indiana. The concrete cap, 200 feet long and weighing 2,600 tons, was moved four feet by waves 13.5 feet high. The wave pressure required to move the cap was calculated to have been as much as 2,500 pounds

per square foot.

Communities along America's "Freshwater Seas" are also vulnerable to fluctuating Great Lakes levels. The National Wildlife Federation found that high water in the summer of 1952 caused \$88 million in damages when 80 homes and cottages collapsed into Lake Michigan. The Washington Post reported that twenty-five years later, storm-driven waves, bred by record high water levels in 1987, caused \$7 million in damages just to the lakefront roads and parks in Chicago.

As the population has exploded along America's coasts, so have the fears of officials charged with evacuating people when hurricanes or major storms threaten. Concern is particularly high for communities in the hurricane-prone Gulf of Mexico, with its low-lying cities and tremendous concentration of coastal population. Two-lane coastal highways, vulnerable water supplies, and an optimistic, obdurate or inexperienced populace make evacuation procedures nightmarish in many Gulf-coast towns.

The Florida Keys, which experienced two of the five deadliest hurricanes in U.S. history, illustrates the difficulty facing evacuation officials. The National Weather Service cannot predict the specific landfall of a hurricane with any accuracy until 12 hours before the storm hits an area. However, according to state officials, it would take at least 36 hours to evacuate the Keys. This time period itself could only be met if the two-lane highway connecting the islands to the mainland was not inundated by storm surges during evacuation -- a possibility that is remote, if not illusory, according to officials. It is therefore a given that some of the Keys hundreds of thousands of residents would not make it off the islands in time to avoid winds ranging from 75 to 155 miles per hour, crashing waves and driving rain.

The hazards of coastal dwelling, along with the explosion of coastal development, led the former director of the National Hurricane Center to conclude that:

"In virtually every coastal city of any size from Texas to Maine . . . the United States is building toward a hurricane disaster."

If such a disaster occurs, it will be incredibly costly to the people and buildings clustered along the storm-prone coasts. Inland taxpayers, too, could find a coastal hurricane disaster costly as tax dollars flow for federal disaster relief and the other programs that help coastal communities develop and redevelop along the coasts. Greater losses could be avoided if new development, in keeping with the goals of the National

Flood Insurance Program, were directed out of hazard areas along the coasts. The 1986 Hazard mitigation Research Program Report, Implementing Coastal Storm Hazard Policy, stresses that, "unless an effective solution is found, by the year 2000 the sum of the individual decisions to exploit the coastal commons could add up to a series of unparalleled national disasters."

2. Erosion

Erosion is a fact of life along the coasts. For example, some coastal geologists believe that 80 to 90 percent of the Atlantic coast is eroding at an average of just under three feet a year. There are basically three approaches to erosion: place development at a safe distance from the highly erodible portions of the coastal zone; attempt to "renourish" the beach with imported sand; or try to "protect" the beach with structural stabilizers such as groins, jetties or seawalls.

These stabilizers, however, often starve downstream beaches by trapping sand onshore and out of the littoral drift, which carries sand and other building material parallel to the coastline. They are also temporary -- and expensive -- devices, lasting only until pounding waves or a storm eventually destroy them.

Whether a beach is "armored" with seawalls or groins, or renourished with huge quantities of pumped-in sand, it remains stubbornly vulnerable to routine or storm-enhanced erosion. For example, the Army Corps of Engineers spent \$12 million in 1988 replenishing the beach at Ocean City, Maryland. Within a half year, storms and routine erosion had washed away 50 percent of the new sand. The New York Times reported that the city is now planning a second phase of replenishment at a cost of \$60 million.

Bluff erosion is particularly serious along the California and Oregon coasts, the Great Lakes and the Chesapeake Bay. FEMA flatly states that bluff erosion is irreversible. Unless the bluff is stabilized or the building moved back, the emergency agency argues, houses built along bluffs are sooner or later destroyed.

It would appear to be a matter of common sense to avoid building in the areas most susceptible to the destructive force of erosion, which is driven by wind and waves and increased by storms. Yet flood insurance policies continue to be issued for structures in the high-hazard zones. Moreover, the Flood Insurance Rate Maps -- from which building codes and insurance policy costs are figured -- do not include erosion, even though

FEMA was directed in 1973 to demarcate an erosion zone on its Flood Insurance Rate Maps.

Thus, despite its mandate to move development out of hazardous, flood-prone areas, the Flood Insurance Program continues to underwrite development in these zones. And the Flood Insurance maps continue to ignore the geologic process that helps define the coast: the fact that it erodes.

3. Sea Level Rise

According to some coastal geologists, "sea level rise joins 'death and taxes' as the inexorable fate of mankind." In its July 1988 study, Greenhouse Effect, Sea Level Rise and Coastal Wetlands, EPA predicts an average global sea level rise of between 4.5 to 7 feet by the year 2100.

EPA believes that sea level rise will have three major types of physical effects: shoreline retreat, increased flooding and landward movement of salt water. Its Greenhouse report states that shorelines will retreat because very low land will be inundated and other land along the shore will erode. A one foot rise in sea level -- one quarter of the minimum rise EPA predicts -- would erode most sandy beaches along the Atlantic and Gulf coasts at least one hundred feet.

In his 1988 "Barrier Island Handbook," coastal geologist Stephen Leatherman reports that sea level rise is averaging a foot per century along the mid-Atlantic coast. The relative rise in sea level has been higher in some areas because of subsidence, such as in Charleston, South Carolina, where ocean levels have grown by nearly 14 inches since 1920. Further along the Gulf coast, land subsidence is a serious problem due to the withdrawal of fluids -- both groundwater and petroleum. Land near Baytown, Texas, Leatherman notes, has sunk over nine feet in less than 100 years, requiring the installment of dikes to hold back the saline waters of Galveston Bay during ordinary tides.

The forces raising sea levels could also breed another serious threat to coastal communities: bigger, faster and more destructive hurricanes. Dr. James Hansen, Director of the Goddard Institute of Space Studies, warns that the global warming that is fueling accelerated sea level rise could also drastically increase the intensity of storms. Hurricanes, considered Class 5 dangerous at 135 miles per hour and above, could pick-up speed by as much as 50 percent. The result: hurricanes with winds of 225 miles per hour. In comparison, the 1988 Hurricane Gilbert, cited in the newsletter "Climate Alert" as the most severe storm in the history of barometric pressure readings, reached 175 miles

per hour.

As a result, hazardous coastal areas, already prone to erosion and hurricanes, could become even more hazardous. What is needed is precisely what the Flood Insurance Program was intended to accomplish: the movement of new development out of areas prone to floods, erosion, and now, sea level rise.

Conclusion

Congress reacted to human tragedy, as well as massive federal expenditures, in creating the National Flood Insurance Program. The loss of human lives to flooding was not a new event in 1968. It has been recorded since pre-Biblical times. What was a relatively new event was the use of federal finances to help communities rebuild in the same hazardous locations along the nation's lakes, rivers and coasts.

But contrary to Congress' intent, the loss of human lives and massive property damage has continued to pile-up along the coasts since the creation of the NFIP. In his "Coastal Flood Insurance" article in the May-June 1986 Oceans magazine, Daniel Lindley notes that 186 deaths and \$2.2 billion in damages occurred in the 10 years prior to the NFIP, while 411 deaths and \$4.7 billion in damages occurred in the 10 years after the Program's inception. Simply put, losses have continued because development in hazardous portions of flood plain areas has continued.

Much is at stake in the effort to curb development in the flood-prone portions of the nation's coasts. Human lives; mammoth property investments; the coastal ecosystem; and the large-scale expenditure of federal tax dollars. Nature does not make a distinction between a sand dune and a home. Erosion, hurricanes and rising seas do not play favorites between a beach and a beach community. If disasterous consequences are to be avoided, federal regulators must begin to recognize that, while beautiful, the coasts are a dangerous -- both financially and humanistically -- place to live.

CHAPTER THREE

THE COST TO THE COASTAL ENVIRONMENT

"Presently there are some 10,000 fishermen in North Carolina who depend on these waters for their livelihoods, and have provided for their families in this manner for the past 300 years. [But] many types of fish are completely gone now . . . Shellfishing bottom is closing at the rate of 37 percent in only the past seven years . . . The pollution and degradation [that] is taking place through the avenues of new and continued [shoreline] development is destroying the very purpose and thing that [tourists] come to this area of North Carolina to view, eat and enjoy."

Kenneth B. Seigler
Onslow Bay Waterman's Association
June 6, 1988

While the Environmental Protection Agency's (EPA) 1986 paper outlining its "Near Coastal Waters Strategy" contained information that shocked quite a few people, it came as no surprise to some of America's watermen. In the report, EPA concluded that "portions of near coastal water and shore habitats in every geographic region of the country and in every coastal state have been found to be degraded to a moderate or severe degree." No coastal region in the country -- Atlantic, Pacific, Great Lakes or Gulf -- was exempt from mysterious fish deaths, swimming bans or beach debris.

Activities occurring within the coastal zone, according to EPA, share blame for "threatening public health, the health and survival of living resources, the coastal economy and the enjoyment of coastal areas." In a look at pollution sources, the Oceanic Society found that sources on land may be responsible for 75 to 85 percent of marine pollution.

This is not surprising since land development in the coastal zone has skyrocketed in the past 40 years. And NOAA estimates that approximately 20 million more people will be living in coastal counties in the year 2000 than in 1980, a 24 percent increase.

Coastal development, underwritten by the National Flood Insurance Program and other federal subsidies, exacts a heavy toll from the fragile land and water of the coastal zone. Resources important to fish and animal life, commercial and recreational fishermen, and a beach-loving public are facing degradation and destruction from unwise development:

1. Barrier beaches, dunes and spits, which protect upland animal, plant and human communities, are being over-run by the influx of shore settlements. Barrier islands lose their natural ability to adapt to flooding and hurricanes when development shackles and binds the mobile landforms, leaving them -- and island communities -- vulnerable to damage from rising sea levels, erosion and storms;
2. According to the Fish and Wildlife Service, development has contributed to the loss of more than 50 percent of the nation's coastal wetlands. With them go irreplaceable habitat for fish and wildlife; and,
3. Near shore waters, which support commercially important fish and shellfish, are suffering unprecedented degradation as onshore development pours pollutants into coastal waters.

There is a pressing national interest in stopping and reversing the decline of America's coastal areas. Uncontrolled, unwise and publicly underwritten shoreline development is threatening coastal resources, shoreline communities and the federal Treasury. As a 1989 NOAA report notes:

"The coastal "crisis" that suddenly seems evident to even the casual observer has not just occurred. It is the cumulative effect of decades of incremental decisionmaking in literally thousands of cases, each affecting a relatively small piece of [a] coastal area. The effects in each case, which did not appear to be particularly significant at the time, have added up to the current coastal ocean crisis, and what may well be the most important national environmental quality problem of the 1990s. It comes as no surprise. The trends

have been clear for many years."

1. Coastal Barrier Development

From Maine to Texas, barrier islands stretch along 2,700 miles of the nation's shoreline. Hundreds of miles of beaches, dunes and spits also act as coastal barriers along the Pacific and Great Lakes shores, sheltering nearshore areas from storm and wind damage, erosion, flooding and rising seas. Indeed, coastal barriers are a critical defense for the entire U.S. coastline.

While barrier islands and beaches protect coastal communities from buffeting storms and water, dunes, in turn, act as sand warehouses, replacing what is eroded from the shore. Along with human communities, a surprisingly large variety of life depends on coastal barriers for shelter. According to a Department of Interior 1988 report, barrier beaches and dunes are essential migratory habitat for hundreds of thousands of birds, who rest or feed along the sandy stretches.

As the areas most prone to hurricanes, storms, erosion and rising sea levels, though, coastal barriers are peculiarly vulnerable to the forces of wind and sea. Yet despite this vulnerability, development in shoreline areas has exploded during the past few decades. A 1986 Science Digest article notes that, prior to World War II, only about 28 of the 280 U.S. barrier islands were at least partly built up. Now, at least 70 are heavily developed.

In its report, the Department of Interior flatly states that "increased affluence and Federal subsidies are among the primary causes for the extensive development of our beaches in the past four decades." This massive development depends on the commitment of millions of federal dollars that underwrite its construction and reconstruction.

Yet development and redevelopment on coastal barriers bring costly results. Important coastal habitat is destroyed. Nearshore water quality is degraded. And burgeoning coastal populations place more and more people at the mercy of nature's uncontrollable forces.

2. Wetlands Loss

Of all the trends in coastal degradation, the loss of the nation's valuable coastal wetlands is certainly one of the most disturbing. According to the Fish and Wildlife Service, about

6 million acres are all that remain of the 48 continental states' wetlands. With the loss of coastal wetlands go nature's fish nurseries, as well as habitat for other wildlife.

But wetlands loss affects humans, as well as nature. The Fish and Wildlife Service (FWS) reported in 1988 that one-half to three-quarters of the wetlands along Lakes Huron, St. Clair and Erie have disappeared, primarily from development, leaving shorelines more vulnerable to erosion and flooding. The FWS further noted that between 1953 and 1973, nearly 25 percent of New Jersey's coastal marshes were filled or diked. Yet these salt marshes are prime wintering grounds for 300,000 to 450,000 waterfowl. Migratory birds have faced a similar fate along the Pacific Coast. In its "Near Coastal Waters" report, the EPA revealed that the San Francisco Bay/Delta region has lost 90-95 percent of its wetlands, thus removing almost all the available resting habitat in the region for migratory species using the western flyway.

While development subsidies help turn wetlands into homes and buildings immensely profitable to developers, the commercial fishing industry suffers from ever-shrinking fish nurseries. According to FWS, about two-thirds of the major commercial fish species depend on estuaries and salt marshes for nursery or spawning grounds.

Wildlife, fish and shellfish habitat are not the only victims of lost wetlands. Ironically, when coastal development destroys wetlands, it leaves itself more vulnerable to flooding and storm damage. Wetlands can reduce shoreline erosion by binding sediment and so resisting erosion, while the plants themselves help slow waterflow. Because of their absorbency and resilience, the FWS estimates wetlands to have a hurricane protection value of \$1,604-1,712 per acre.

Yet tens of thousands of acres of coastal marshes and swamps, mangroves and pocosins fall beneath development each year.

The future of coastal fisheries and wildlife depends on a present that has widely available and healthy wetlands. As bumperstickers in North Carolina attest, "No Wetlands -- No Seafood." Yet shoreline development, subsidized by flood insurance, is contributing to the demise of the nation's fish nurseries, imperilling the nation's fishing industries and the many bird and animal species that call wetlands home.

3. Degraded Nearshore Waters

Coastal waters are the nation's sink. Already stressed by pollution from upland sources, coastal ecosystems are suffering from the onslaught of contaminants from shoreline development.

Pollutants in urban areas along the coast -- such as fertilizers from lawns, and oil and gasoline from streets -- are washed into coastal waters when it rains or storms. In fact, in its 1985 examination of coastal pollution sources, The Oceanic Society found that nearly half of oil pollution of the sea comes from urban runoff, along with other coastal activities and river discharges. As a whole, it is not surprising that urban runoff is a growing problem along the increasingly populated coasts.

Expanding coastal communities contribute another major source of pollution to nearshore coastal waters: partially treated human wastes. In its 1989 "Ebb Tide for Pollution" report, the Natural Resources Defense Council found that 3.6 trillion gallons of sewage waste are released each year into coastal rivers that eventually reach the sea. By the year 2000, NOAA predicts that roughly 2,835 sewage treatment works will discharge 5.4 trillion gallons of wastewater into coastal waters.

The Natural Resources Defense Council (NRDC) report notes that even properly treated sewage wastewater contains considerable amounts of pollution. Bacteria, biological wastes, pathogens and nutrients can be found in sewage wastes. NRDC points out that these pollutants reduce oxygen levels in coastal waters and consequently suffocate life in productive waters. Add to these pollutants the wastes from factories that discharge into sewage systems, and the quantities of dangerous contaminants reaching coastal waters is staggering.

Coastal wastewater discharges are already responsible for closing many of the nation's productive shellfish beds. According to the NOAA Shellfish Registers, sewage pollution helped close 53 percent of the productive shellfish beds on the Atlantic coast. On the Pacific coast, only 30 percent of the waters that used to produce healthy shellfish can still do so. And in the Gulf, pollution has closed down 58 percent of the shellfish beds.

Contaminants that are closing down shellfish beds affect other uses of coastal waters, as well. High levels of bacteria in coastal waters cause temporary or permanent beach closures. According to NRDC, principally because of sewage contamination, 80 beaches were closed in New York and New Jersey between Memorial Day and the end of July 1989. Indeed, a two year survey completed in 1989 by the state of New Jersey and other organizations found that those who swam in the state's coastal

waters suffered from more health problems than those who waded in the water, while in turn, waders became ill more often than those who merely laid on the beach.

Conclusion

Barrier islands and beaches, coastal wetlands and nearshore waters are near the breaking point from unwise coastal development. It is in the nation's interest that steps be taken to better protect valuable, sensitive coastal areas. Economic, as well as wildlife and aesthetic interests, are at stake.

The FWS estimated in 1988 that coastal wetlands may contribute \$5 billion to the production of fish and shellfish in U.S. coastal waters. Yet wetlands continue to disappear at an alarming rate.

Barrier islands and beaches, shackled by development, lose the ability to accommodate the forces of erosion, rising sea levels, storms and hurricanes. Communities on coastal barriers are left ever-more vulnerable to natural forces they can neither control nor adequately defend themselves against.

Runoff from growing coastal cities and suburbs, along with the trillions of gallons of wastewater they generate, degrade coastal water quality. The end result is un-fishable, un-swimmable waters, and local economies fractured by waters too dirty to earn a living from.

It makes little sense to use precious tax dollars to support development in hazardous, environmentally important coastal areas. The original intent of the National Flood Insurance Program was to offer communities the benefit of low-cost insurance in return for those communities moving future development out of the flood-prone and sensitive shoreline areas. Yet this mandate has been, by and large, ignored. Instead, development flourishes nearly at the water's edge courtesy of tax dollars that inadvertently contribute to the alarming decline of the nation's coastal resources.

A December 1988 report by the U.S. House of Representatives' Committee on Merchant Marine and Fisheries, entitled, "Coastal Waters in Jeopardy: Reversing the Decline and Protecting America's Coastal Resources," documented many of these problems. One of its recommendations was that, "Congress should undertake a careful examination of the types of Federal subsidies and direct undertakings that might be suspended in those coastal areas" where water quality is suffering.

Demanding that the Flood Insurance Program keep its promises is a good first step. The health of the coasts is at stake. The health and safety of coastal dwellers are also increasingly at stake. So, too, is the health of the federal Treasury as the number of people and amount of property vulnerable to destructive acts of nature increase. National Flood Insurance claims, disaster relief payments, along with disaster assistance programs through many federal agencies, could cripple the Treasury when rising sea levels, erosion and fierce storms blitz coastal areas.

CHAPTER FOUR

CONTROLLING THE COSTS: TEN RECOMMENDED CHANGES TO THE NATIONAL FLOOD INSURANCE PROGRAM

The problems with the Flood Insurance Program are not insurmountable. Several steps need to be taken in order for the Program to meet both its hazard area management and financial savings goals. The Federal Emergency Management Agency, in conjunction with state flood plain managers and other relevant state and local officials, must take an aggressive, nationwide approach to solving the problems that are keeping the Flood Insurance Program from meeting its goals. The stakes are high. Too many human lives, federal tax dollars and coastal resources are threatened by the way in which the Program currently functions for it to be allowed to continue on its present course.

If implemented, the following ten steps would go far toward correcting many of the Program's current insufficiencies. Briefly stated, the following are recommended changes to the National Flood Insurance Program that Congress should enact:

1. Direct participating communities to: a) require that new and substantially improved construction be located behind the erosion-prone zone, and b) delineate sea level rise areas within and beyond the erosion zone that have enforceable building code restrictions and wetlands protections.

Coastal states participating in the federal Coastal Zone Management Program often require that new construction be "set back" from the erodible shorefront. To do this, coastal states calculate the annual erosion rates along the coast. They then multiply that erosion rate by a certain number of years to establish where erosion is expected to occur over a given period. Buildings are then required to be located behind the erosion zone to protect the building from destruction and undermining. However, FEMA continues to issue flood insurance policies for development within the erosion zone, making it more difficult for conscientious coastal states to implement wise coastal management. Therefore, FEMA should require that communities participating in the National Flood Insurance Program establish set back requirements for new buildings. Smaller buildings should be required to be located landward of the area likely to be eroded over 50 years. Larger buildings should be required to locate behind the area likely to be eroded in a 75-year period.

Implementation of such a setback for new construction would help reduce the number of properties damaged by long-term erosion

and sea level rise. It is important that the NFIP begin now to address the problem of sea level rise, as well as erosion. Although major changes in sea levels, and the possible loss of coastal wetlands from inundation, may not be experienced in many places for another 50 years, the average life span of a building is more than 70 years, according to the National Association of Home Builders. Therefore, FEMA should delineate the sea level rise zones for areas likely to be affected in the next 100 years, and require participating communities to enforce building code restrictions ensuring the movability of new construction within this zone. FEMA should also require the mandatory relocation of these structures as coastal wetlands migrate landward.

Requiring communities to establish erosion set-back rates, and demarcate sea level rise areas with restrictions, would help keep new development out of the hazardous shoreline area, thus decreasing future expenditures for flood insurance claims, disaster relief and casualty loss deductions. A strong set-back and sea level rise planning would also help create a natural buffer zone to allow for the migration of wetlands as water levels rise.

2. Make all NFIP policies fully actuarial by factoring sea level rise, storm probability, and long-term erosion into calculations for flood insurance premium rates.

Currently, the NFIP calculates flood insurance premiums by preparing flood insurance rate maps (FIRMs). These maps denote flood zones and their accompanying hazards, and policy holders pay premium rates according to the flood risk. If all risk factors are considered, the policy is actuarial and premiums should cover the cost of the program.

But since such coastal hazards as sea level rise and long-term erosion are not factored into premium calculations, the true financial risk of coastal development is masked from insurance beneficiaries. Instead, the risk of this development is borne by the American taxpayers. Accelerated sea level rise, and accompanying increased erosion and storm intensity, will significantly increase the magnitude and costs of damages to shoreline development. Unless all risks are reflected in premium rates, the NFIP will continue to be in the position of providing a financial safety net for unsound development.

3. Discontinue issuance of flood insurance policies for new or substantially improved development in the coastal high-hazard zone, and its corollary along the Great Lakes.

According to FEMA, since 1978, losses in the high-hazard

zone have averaged \$8,260. This is \$1,190 higher than the average loss in the Program as a whole. As well as being costly, development in the high-hazard coastal zone endangers human life. In addition, the availability of flood insurance in high-hazard zones runs counter to the legislated goal of the NFIP to guide new development away from hazard-prone areas. A ban on flood insurance policies for new and substantially improved development in the high-hazard zone would discourage costly, hazard-prone construction. Federal taxpayers should not have to provide an expensive safety net for those who choose to build in the coastal equivalent of the rim of the volcano.

4. Increase individual participation in the Program by improving flood hazard notifications to flood plain residents, and enforcing the mandatory purchase requirement.

Under current law, federally-insured banks, savings and loan associations, or similar institutions, cannot make loans secured by property in flood hazard areas unless the property is covered by flood insurance. This is known as the "mandatory purchase requirement." This requirement is intended to alert the prospective purchaser that the property is located in a flood-hazard area, and that flood insurance must be purchased and flood plain regulations -- such as construction codes -- met. Yet according to testimony given in May 1989, it appears that this requirement is not being met by many lenders. As a result, banks insured by federal dollars are helping homeowners build in hazard areas without having to meet flood plain regulations or buy federal flood insurance. It also appears likely that many lenders are failing to make sure that property owners maintain their flood insurance policies, as they are supposed to do for the life of the federally-insured loan.

While the NFIP prohibits federally-regulated or insured lending institutions from making loans for property in a flood hazard area that does not have a flood insurance policy, lenders are still allowed to make conventional loans when the community in which the building is located is not participating in the NFIP. By not being a part of the NFIP, these communities are not required to undertake comprehensive flood plain management including construction standards, flood mitigation efforts, and the removal of structures from the high-hazard zone.

Federally-insured lenders should be barred from making, increasing, renewing or extending loans within special flood hazard areas, unless the community is participating in the NFIP. This would limit the risk of real estate investments in flood-prone areas by federally-insured financial institutions, and would encourage community participation in the NFIP. In addition, lenders must be required to make sure that owners of

property in participating communities who seek a federally-insured loan have a federal flood insurance policy. Improving notification and imposing a modest penalty on lenders who fail to require the purchase of flood insurance would help ensure compliance with the law. If the Flood Insurance Program began to move development out of the highly hazardous flood areas, it would become an important tool for better environmental and economic conservation. Increasing participation in the Program would therefore help protect all concerned, including property owners, lenders and ultimately, U.S. taxpayers.

5. Increase premiums for repeated damage claims to encourage relocation instead of reconstruction.

According to an April 1988 GAO report, roughly 43 percent of all losses under the NFIP are for repeated damages to the same properties. Since 1978, FEMA has paid more than \$1 billion to policy holders so they could repair and rebuild structures in the same hazard-prone locations, only to have the structures damaged again. Yet there is no limit on the number or frequency of damage claims which can be filed for insured properties. Nor is there any increase in premiums or surcharges for repeat claims.

The NFIP is the only insurance program in which personal loss experience is not reflected in premium rates. American taxpayers should not have to shoulder the burden of costly renovation and reconstruction in flood plain areas which have proven unsafe for development. Increasing premiums for repeated loss claims would help make premiums actuarial and place more of the financial responsibility of locating in hazard-prone areas on insurance beneficiaries, rather than taxpayers.

6. Create a well-funded, easily-used flood plain land acquisition program through rejuvenation of the NFIP's Section 1362 program.

The NFIP already includes a section -- Section 1362 -- providing for the acquisition of damaged property in flood-prone areas. Once acquired, the property is then turned over to state and local governments to be used as open space. According to FEMA, the Section 1362 program could save taxpayers money, relieve state and local governments of the costs of providing emergency services to residents of flood-prone areas, and provide communities with land for public recreation and other open-space uses. Since Section 1362 first received funding in 1980, 1,257 of the 1,727 applications for property acquisition were approved by FEMA. But only 727 of the approved properties -- less than 60 percent -- were actually purchased by FEMA. This is an average of less than 100 properties per year.

Inadequate funding of the Section 1362 program has been one of the major reasons for the low acquisition rate. On average, since 1980 Congress has appropriated less than \$5 million annually for acquisitions. Some years, however, FEMA has been unable to use even this funding, since 30 percent of the properties for which acquisition applications are filed are unable to meet FEMA's overly-restrictive qualifying criteria. An effective, well-used acquisition program would reduce future expenditures for disaster relief and flood insurance claims.

7. Congress should reauthorize and strengthen the Section 1306 Jones-Upton provision.

The Section 1306 Jones-Upton provision was enacted for a two-year trial period in 1987. The provision provides flood insurance payments for relocation or demolition to property owners whose structures are in "imminent danger of collapse" due to erosion or subsidence. Before this provision was created, homeowners had to wait for their flood-threatened houses to be destroyed before they could receive any flood insurance money to relocate their homes.

Under the provision, property owners can obtain up to 40 percent of the value of their structure to pay for relocation. Alternatively, they can claim a payment for 100 percent of the structure's value, plus 10 percent for demolition. However, they can only get further flood insurance coverage if they relocate or reconstruct behind a 30-year erosion setback for smaller structures, and a 60-year setback for larger buildings. By facilitating the removal of buildings from environmentally sensitive and hazard-prone areas, the Jones-Upton provision has both environmental and economic advantages.

8. Increase enforcement personnel and activities under the National Flood Insurance Program.

Currently, there are only about 120 FEMA officials at the national office and 10 regional offices overseeing enforcement of NFIP regulations in the 18,000 participating communities.

At a 1981 Congressional hearing, a Federal Insurance Agency administrator admitted that monitoring of the NFIP should be more than doubled, since low staffing levels only allowed for compliance visits to 20 percent of the participating communities each year. A year later, GAO found that FEMA's monitoring program was inadequate for enforcing the Program's flood plain management regulations. Yet in 1988, community compliance visits were scheduled for less than 12 percent of participating communities.

Compliance visits are important. A GAO sampling of community visits revealed that 72 percent of the communities visited had some compliance problem. Since the only way the NFIP can fulfill its goal of reducing future flood expenditures is through community compliance with sound flood plain regulations, adequate enforcement of these regulations is crucial. Therefore, additional resources should be directed towards enforcement within the National Flood Insurance Program.

9. As one of the requirements of community participation in the NFIP, FEMA should require each community to develop and implement a program to protect the natural and beneficial values of its floodplains.

In the Unified National Program for Floodplain Management, two coequal goals are stated: 1) reducing flood damages, and 2) maintaining the natural and beneficial values of flood plain resources. It is the second of these goals, in particular, that has received the least attention. The NFIP should provide additional direction to communities to help protect the natural and beneficial values of flood plains, particularly wetlands. Wetlands are immensely important to the nation's environmental and economic health. Yet half of the nation's coastal wetlands have already been lost and wetland loss from development continues. A large percentage of the nation's wetlands are located in the 100-year flood plain, which is the principal focus of the NFIP. Flood plains also perform numerous other valuable functions, including flood water retention, erosion reduction, water purification, wildlife habitat and groundwater recharge. Therefore, the NFIP should be made to help protect these critical flood plain values and functions as part of its goal of wise flood plain management.

10. Require FEMA to update its flood plain maps on a regular basis.

Flood insurance premiums are based on the hazards associated with the zones demarcated on FEMA's flood insurance rate maps. Without up-to-date and accurate maps, premium rates will not reflect the true risk of a particular area and cannot be considered actuarial. Many flood plain areas and their accompanying hazards are quite dynamic as a result of frequent changes in shoreline topography and run-off due to erosion and accretion, sea level rise, upstream river development and dam building, and impacts from nearby shoreline stabilization projects. It is therefore critical that FEMA update its flood plain maps for all participating communities on a regular and frequent basis -- such as every 5 years -- to reflect these

changes. Funding for this periodic mapping should come from premium payments to the NFIP.

Conclusion

Unwise shoreline development threatens human lives, economic resources and the coastal environment. These threats have already been translated into action. Lives are already lost from storms and hurricanes that sweep through heavily developed coastal areas. Taxpayer funds are used to shore-up coastal construction and reconstruction through over 50 federal programs that provide development assistance. And coastal waters and lands suffer the impacts from the shoreline development that lines our coasts.

The National Flood Insurance Program was intended to take steps to end the spiral of destructive hazard-area development. Instead, it has been implemented in a way to make coastal communities, the federal taxpayer and the coastal environment more vulnerable to damage and loss from the forces of nature that make the coastal zone a hazardous place to live.

Implementing the recommended changes would help make the NFIP an environmentally sensitive and economically sound flood plain management program. Failing to make these changes would let the National Flood Insurance Program continue to be a massive "Spend and Mend" program that encourages development and redevelopment along the nation's thin and hazard-prone edge.

GLOSSARY OF KEY NATIONAL FLOOD INSURANCE PROGRAM TERMS

Federal Emergency Management Agency (FEMA): An independent agency which oversees response and prevention programs for natural and unnatural disasters and emergencies, such as hurricanes and floods.

Federal Insurance Administration (FIA): The branch of FEMA that administers the National Flood Insurance Program (NFIP).

Flood Insurance Rate Maps (FIRMs): The official NFIP map of a community on which FIA has delineated the special hazard areas and the risk premium zones applicable to the community.

Community: Any state, town, city, county or political subdivision with the authority to adopt and enforce flood plain management regulations for areas within its jurisdiction.

Emergency Program: Initial phase of the Program (before FEMA has completed the community's FIRM) in which a community is provided with a limited amount of subsidized insurance in return for the community's implementation of limited measures to reduce flood damages to new construction.

Regular Program: The second phase of the NFIP (after a community's FIRM has been completed) in which a community must require new construction to meet minimum NFIP flood plain management standards and pay premiums reflecting the flood risk outlined on the FIRM. Once this is completed, the community is eligible to receive additional insurance coverage. All structures constructed prior to the effective date of the community's FIRM are eligible for coverage at subsidized rates which do not reflect the true flood risk. Almost all communities participating in the NFIP are now in the regular program.

Flood Plain: The relatively flat areas adjoining rivers, the Great Lakes and marine coastal areas.

100-year Flood Plain: The flood plain area that is subject to a one percent or greater chance of flooding in any given year. Zones in the 100-year flood plain include the A and V zones. This area is also known as the Special Flood Hazard Area (SFHA).

Velocity or "V" Zone: The area within the 100-year flood plain subject to high velocity waters. This is also known as the high hazard area.

Write Your Own Program: A program created in 1981 to encourage private sector insurance companies to sell and service federal flood insurance under their own names.

Mandatory Purchase Requirement: A provision passed in 1973 barring federally-insured lenders from making loans secured by properties within the 100-year flood plain unless the property is insured against flood damages; i.e., participating in the National Flood Insurance Program.

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