

**A COMPARATIVE LOOK AT
PUBLIC LIABILITY
FOR
FLOOD HAZARD MITIGATION**

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FOREWORD

This paper takes a comparative look at government liability for flood hazard “mitigation” measures. The term “mitigation” is broadly used in the paper to include hazard reduction measures such as dams, levees and other structures. Mitigation measures also include loss reduction efforts such as flood hazard mapping, warning systems, evacuation planning, and floodplain regulations such as zoning and building codes. The paper briefly considers, as well, suits against government to compel payment of disaster assistance and government flood insurance.

This paper is one of a series of papers concerning flood-related liability prepared by the author and Ed Thomas, Esq. with support from the Association of State Floodplain Managers Foundation. These also include papers dealing with “no adverse impact” floodplain management, liability for levees and dams, and professional liability for construction in flood hazard areas. See <http://www.floods.org/home/default.asp>.

This paper addresses topics not extensively covered by earlier papers. It begins with a comparison of liability for the full range of hazard reduction and loss reduction measures. It next considers various factors considered by the courts in determining whether a government is liable for flood or erosion losses. It then considers the liability implications of various steps or stages in government hazard and loss reduction. It next considers case law addressing individual hazard reduction and loss reduction measures. It concludes with recommendations for governments to avoid or reduce potential liability.

This paper attempts to simplify a complicated subject. An effort has been made to make the paper understandable by nonlawyers while, simultaneously, providing many footnotes to court cases for the lawyers.

DISCLAIMER

The paper does not provide legal advice for your state. For legal advice including the status of statutory and case law in your jurisdiction consult a lawyer licensed in your state. The paper describes the general status of law throughout the nation and not that of a particular jurisdiction. It reflects our own opinions concerning the content of cases and trends in the law. It, should, therefore, be used with care.

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SUMMARY

Over the last four decades, governments have broadly adopted flood loss reduction measures including both structural measures (dikes, dams, levees, grounds, stormwater systems) and nonstructural measures (building codes, land use planning, flood predictions, warning systems, other). These measures have, to a greater or lesser extent, resulted in law suits when flood or erosion losses do occur. In addition, landowners have sued governments in some instances for floodplain regulations, claiming an unconstitutional taking of private property or that permits to build have increased flooding on their properties.

To what extent and in what contexts have governments been held liable for undertaking structural and nonstructural flood loss reduction measures under negligence, trespass, strict liability, nuisance, inverse condemnation or other legal theories? Are successful suits more common for some measures than others? Why? What factors contribute to successful and unsuccessful suits? How may governments reduce the potential for successful suits?

Comparative Overview of Liability

Liability for structural measures: Courts have often held governments liable for increasing flood or erosion hazards on adjacent lands by grading or filling land or by constructing structural hazard reduction measures such as dikes, dams, and levees. Although often intended to reduce flood losses, structural measures increase flood losses in some circumstances, particularly when design frequencies are exceeded or measures are inadequately designed, constructed, operated, or maintained. When injuries occur, private landowners and other members of the public increasingly sue governments for economic flood damages and in some instances pain, and suffering. Many successful suits have targeted “ministerial” government actions during the construction or administration phases of structural projects such as failure to maintain ditches and storm water facilities.

With regard to liability for structural measures, courts have more specifically often found governments:

--Strictly liable for constructing dams which collapse due to inadequate design, construction, operation or maintenance. They have also found governments liable for negligence or a taking of property due to seepage caused by dams.

--Liable for negligence in the design (in some instances), construction, maintenance and operation of groins, sea walls, levees, bridges, and stormwater facilities which increase flooding or erosion on private properties.

Liability for nonstructural measures (other than regulations). Courts have held governments liable in small number of cases for nonstructural loss reduction measures such as inadequate flood warnings, inadequate dissemination of flood information, and other nonstructural flood loss reduction measures. Few of these cases have succeeded due to explicit liability exemptions in state tort claim and emergency management statutes, because government has no duty to provide “benefits”, and because many of these measures such as weather prediction involve a great deal of discretion.

With regard to liability for nonstructural measures, courts have more specifically:

--Not found governments liable for weather and flood forecasts because of the large amount of discretion involved in making such forecasts.

--In only a few cases found governments liable for inadequate dissemination of weather or flood forecast information.

--Not found governments liable for inadequate flood maps.

--In only a few cases found governments liable for inadequate emergency management activities.

Liability for regulations. Courts have held governments liable in even a smaller number of cases for “taking” private property without payment of just compensation through adoption, administration and enforcement of floodplain regulations or refusing to issue permits pursuant to regulations.

However, some courts have also held governments liable for negligence or nuisances when governments issue regulatory permits for buildings, other structures, or subdivisions which cause increased flood hazards on other property. This is particularly true where governments not only approve but accept dedications of stormwater, flood control and other facilities.

More specifically, courts have:

--Strongly and universally supported performance-oriented floodplain regulations against takings claims.

--Broadly supported regulations which exceed minimum Federal Emergency Management Agency (FEMA) standards including flood protection elevations which exceed FEMA requirements, floodway designations (e.g., zero rise), and beach and river setbacks. Courts have only held highly restrictive floodplain regulations a taking in a few cases in which the regulations denied all economic use of entire parcels.

--In some jurisdictions, held governments liable for negligence or nuisances when governments issue regulatory permits for buildings, other structures, or subdivisions which cause increased flood hazards on other property or for inadequate inspections or monitoring.

Reducing Liability

Because of the large number of successful liability suits concerning structural hazard reduction measures, governments should approach design, construction, operation and maintenance of such measures with particular care. Residual risks from floods exceeding design frequencies need to be evaluated and reflected in hazard management and communicated to floodplain occupants.

In light of the small number of successful suits with nonstructural measures, governments can have more confidence that nonstructural mitigation measures will not be subject to successful liability suits. However, despite the relatively small number of successful suits to date, governments need to take increasing care in flood mapping, design and implementation of warning systems and application of other nonstructural mitigation measures. The standard of care needed to avoid liability in the use of such measures will continually rise as technology and data bases improve.

Governments may also have confidence that floodplain regulations will be upheld against “takings” challenges, providing regulations do not deny all economic, non-nuisance use of entire parcels of floodplain lands. However, governments also need to exercise care in drafting and administering regulations. They need to be fair and even-handed in administering regulations. In addition, they need to be increasingly careful in issuing building permits, approving subdivision plans, and accepting dedications of stormwater systems which may increase flooding on the property of other landowners. They need to apply a “no adverse impact” standard. They need to insure that dedication requirements (e.g., requiring that floodplains or floodways be dedicated as open space) are roughly proportional to the burdens imposed by proposed buildings, subdivisions and other activities in the floodplain.

Governments have available to them a variety of more specific strategies to avoid or reduce the potential for liability from floods and erosion hazards while, simultaneously, achieve sound land management objectives. See discussion at the end of this paper.

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LIABILITY CONTEXTS

Despite the expenditure of more than 200 billion nationally for dams, dikes, levees, and other flood control structures, flood losses in the U.S. continue to rise. Rising losses are accompanied by increased “liability” suits. Private landowners who are damaged by floods increasingly file nuisance, trespass, negligence, or “taking” claims against governmental entities claiming that governments are responsible for flood or erosion losses. In one levee breach suit alone in California, 3000 landowners are recovering 464 million dollars from the state in damages for defective levees.¹ More than 250,000 claimants in New Orleans and along the Mississippi and Louisiana coasts have filed suites for more than 285 billion dollars against all levels of government for flood damages caused by Hurricane Katrina.²

Most of the successful suits based upon flooding or erosion occur when governments interfere with flood flows or drainage by fills or grading or flood and erosion control structures (e.g., dikes, dams, levees, groins, seawalls, stormwater systems). Private landowners often sue governments for increasing hazards on private lands by the construction, operation, or improper maintenance of structures on adjacent lands. Structures may divert floodwaters onto other properties and increase natural hazards in some circumstances although they may decrease them in others. For example, dams and levees may burst or be overtopped when their design capacities are exceeded although they provide protection for smaller floods. Stormwater systems often flood streets and basements when improperly designed or maintained or their design frequencies are exceeded. Sea walls and groins often accelerate erosion on adjacent lands.

As will be discussed below, a much smaller number of successful suits have concerned nonstructural hazard loss reduction measures such as hazard predictions, flood mapping, flood warning systems, and evacuation plans.

Finally a small number of successful suits have concerned floodplain regulations where landowners have challenged regulations as a taking of private property without payment of just compensation.

Table 1 provides a list of flood-related government activities which may result in flood-related liability suits. These activities will be collectively and individually examined below.

¹ See *Paterno vs. State of California*, 113 Cal.App.4th 998 (Calif., 2003).

² See E. Thomas, 2007, *Recovery Following Hurricane Katrina: Will Litigation and Uncertainty Today Make for an Improved Tomorrow?* Vol 29, no. 5, National Wetlands Newsletter, Environmental Law Institute, Washington, D.C.

Table 1
Liability Contexts

Liability contexts include:

--Design, construction, operation, and maintenance of **structures** to reduce naturally occurring hazards on private or public lands such as dikes, dams, levees, stormwater facilities, groins, debris basins, and landslide control structures;

--Issuance of **hazard predictions** (weather conditions, floods, earthquakes, volcanic eruptions, etc.);

--Construction and operation of **warning systems** (this includes not only predictions but dissemination of information) and erection of warning signs;

--Preparation, issuance and distribution of **hazard maps** and their use in regulatory and nonregulatory contexts;

--**Hazard mitigation planning** and the implementation of these plans;

--Performance of **emergency services** during or after a hazard event such as search and rescue, fire-fighting, and traffic control;

--Adoption, administration and enforcement of **regulations** including inspections, permit processing, etc.;

--Identification, construction, operation of **shelters** (tornado, hurricane, flood, etc.) for use during and immediately after a hazard event;

--Administration of government **insurance** programs (e.g., the National Flood Insurance Program) including issuance of policies, rating, payment of claims, etc.; and

--Distribution of **disaster assistance** including food, clothing, housing, grants, and loans.

OVERVIEW: LOSS REDUCTION MEASURES IN THE COURTS

Both structural and nonstructural measures are designed to reduce or “mitigate” flood losses. Yet, there are huge differences in the number of successful liability suits pertaining to each.

Why?

A number of reasons may be suggested:

(1) **Flood and erosion control structures.** Structural measures are particularly susceptible to successful suits for a number of reasons:

- Government flood and stormwater control structures typically involve public ownership of land or public acquisition of easements. Courts tend to treat governments like private landowners when governments own and manage lands. Governments are then considered to be operating in a “proprietary” rather than “governmental” capacity and the defense of sovereign immunity does not apply.
- Governmental units have no duty to the public under most circumstances to reduce naturally occurring flooding. But, once they decide to act, they must act reasonably. Governments are often held liable for structures which increase flooding and flood/erosion in certain circumstances although they may reduce hazards in others.³ Structures may increase the upstream or downstream total amount of flood waters, peak flows, flood depths, and flood velocities in some instances. They may change the point of flood discharge. Such increases and changes form basis for suits based upon “nuisance”, “trespass”, violation of “riparian” rights, and violation of “surface water” rights and duties. They may also constitute a “takings” without payment of just compensation or constitute negligence.
- Catastrophic damages may result if structural designs are exceeded. Structures are, therefore, “high risk” and governments must exercise particularly great care.
- In many states, governments may be held “strictly liable” for damages due to a collapse of a dam.⁴ With strict liability, damaged individuals need not demonstrate the unreasonableness of conduct.
- Under common law and state tort claim acts, governments do not enjoy sovereign immunity and are therefore subject to suit when they create nuisances or physically “take” private property without payment of just compensation. Fills, drainage and structures often result in physical water and erosion damage to other properties and a resulting “taking”.

³ See cases cited in notes 19-49 and accompanying text. See Kusler and Thomas, No Adverse Impact Floodplain Management and the Courts, http://www.floods.org/PDF/ASFPM_NAI_Legal_Paper_1107.pdf

⁴ See Thomas, Liability for Water Control Structure Failure Due to Flooding, http://www.floods.org/PDF/NAI_Liability_Failure_Facilities_0906.pdf

(2) Nonstructural loss reduction measures (other than regulations):

Nonstructural flood loss reduction measures are less susceptible to successful suits for several reasons:

- Nonstructural measures do not typically involve public ownership and public management of land. See above. Consequently, most nonstructural measures are considered by the courts to be “governmental” rather than “proprietary” in nature and sovereign immunity applies.
- Nonstructural measures (e.g., flood warning systems) do not increase naturally occurring flood or erosion levels as do some structural measures (e.g., catastrophic damages from the burst of a dam). Therefore, nonstructural measures do not ordinarily form the basis for a suit based on trespass, nuisance, riparian rights, or the law of diffused surface water. Nonstructural measures may, however, form the basis for a suit based on negligence (lack of reasonable care) under certain circumstances.
- The design and implementation of nonstructural measures typically involve large amounts of discretion (e.g., flood forecasting) Courts generally do not hold governments liable for discretionary acts because sovereign immunity applies.⁵
- Nonstructural measures such emergency planning, flood warning systems, and issuance of permits are often exempted from liability by state emergency management and tort claim acts.⁶ Sovereign immunity, therefore, applies. Structural measures are not similarly exempted.

(3) Regulations: Only a very small number of landowner challenges to regulations as a taking of private property without payment of just compensation have succeeded for several reasons:⁷

- The burden is upon a landowner to show a taking. This is a difficult burden to meet because he or she must show compliance with a number of procedural requirements and typically must show that the regulations deny all economic use of entire parcels.
- A number of procedural legal defenses may apply:
 - Statute of limitation has run.
 - The landowner has not applied for a permit.
 - The landowner has not applied for a variance.

⁵ See cases and discussion accompanying note 19 below.

⁶ See cases and discussion accompanying notes 88-103 below.

⁷ See cases and discussion accompanying notes 111-130 below.

- The landowner has not first submitted his or her claim for damages first to the state or local government as required by the applicable tort claim act before filing suit.
 - The landowner has not litigated his or her taking claim in state court before filing suit in federal court.
- A landowner has no right at common law to make a nuisance of himself or herself or to threaten public safety. Often landowners propose uses such as fills or structures (e.g., levees) in floodways which increase flood heights and damage to adjacent lands.
 - Courts give great weight to protection of public safety and prevention of nuisances in balancing public interests and private rights.
 - Public rights (public trust, navigable servitude) often apply, particularly to lands below the high water mark of rivers, streams, lakes and the oceans. Private rights are subservient to public rights in such contexts and private activities may be tightly controlled without “taking” private property.
 - A landowner is often aware of the floodplain regulations when he or she purchases floodplain property. Awareness of regulations does not prevent a constitutional challenge but it does reduce a landowner’s “investment-backed expectations” and the likely success of such a challenge.
 - Regulations are technically based. Courts tend to defer to regulations based on technical studies and generally defer to the decision-making of expert government agencies.
 - Floodplain regulations are part of a national regulatory scheme involving federal, state, and local regulations. Courts have offered this as a reason for supporting regulations in several cases.⁸

**FACTORS CONSIDERED RELEVANT BY COURTS IN DETERMINING
WHETHER GOVERNMENTS ARE LIABLE**

A number of factors affect the success of liability suits applying to structural and nonstructural measures. These factors to some extent cut across the various legal theories which form the basis for suits—negligence, trespass, nuisance, riparian rights, surface water law, and inverse condemnation. Some of the more important include:

⁸ See generally North Carolina Supreme Court in *Responsible Citizens in Opposition to Flood Plain Ordinance v. City of Asheville*, 302 S.E.2d 204 (N.C., 1983); *R&E, Inc. v. Municipality of Anchorage*, 34 P.3d 289, 298 (Ala., 2001)

Is Government Acting as a Landowner?

Governments are generally acting as “landowners” when they construct and operate structural measures (dams, levees, groins, etc). Courts therefore consider governments to be acting in a “proprietary” rather than a “governmental” capacity.⁹ Sovereign immunity does not apply and adjacent landowners may sue governments, like adjacent private landowners, for nuisance, trespass, strict liability, and violation of riparian rights. Impacted landowners may also sue governments for “inverse condemnation.”

In contrast, governments are rarely acting as landowners when they implement nonstructural hazard loss mitigation measures. Governments are, instead, considered to be acting in a “governmental” capacity and sovereign immunity is usually a defense. They may be sued for negligence in some instances--“unreasonable” conduct—but are not strictly liable.

Do Measures Increase Natural Hazards or Hazard Risks?

Most of the successful flood-related suits against governments to date have involved situations in which government drainage ditches, fills, grading or structural flood hazard reduction measures have increased natural hazards or hazard risks. Such increases may form the grounds for suits based upon trespass, nuisance, negligence, strict liability, riparian rights or violation of the rules of surface water.¹⁰

In contrast, nonstructural loss reduction measures rarely increase natural hazards.

Is the Conduct “Reasonable” Under the Circumstances?

Governments are often liable for flood damages when the flood or erosion damages are caused by what courts or juries consider “unreasonable” government conduct.¹¹ This is true for both structural and nonstructural measures.

A broad range of factors are relevant to the reasonableness of government conduct in a particular instance such as whether government staff have knowledge of potential flood problems, the foreseeability of floods and resulting damage to individuals, the degree of risk involved, the norms of the profession, applicable regulations, and the amount of discretion involved. There are many agreed upon and specific standards in the literature and in the engineering profession for design of dams, dikes, levees, stormwater systems and other structures. This facilitates proof of a “norm” and “unreasonableness” in design, construction, operation, or maintenance. In contrast, there are no bright lines for the determining the unreasonableness of government decisions pertaining to

⁹ See, e.g., *Heffner v. Montgomery County*, 545 A.2d 67 (Md., 1988).

¹⁰ See generally cases and discussion below. See also Kusler and Thomas, *No Adverse Impact Floodplain Management and the Courts*, http://www.floods.org/PDF/ASFPM_NAI_Legal_Paper_1107.pdf

¹¹ See, e.g., *Scully v. Middleton*, 751 S.W.2d 5 (Ark., 1988).

nonstructural measures (e.g., flood predictions or warnings) and this results in less successful suits.

How Great Are the Risks?

The amount of care which a governmental unit must exercise in carrying out a flood-related activity depends upon the magnitude of the risk. Governmental units must be very careful in dealing with high risk situations where loss of life and severe economic losses may occur such as the design, construction, operation and maintenance of a dam or levee. Because of the high risks involved, courts in many states have held public and private owners of dams and levees “strictly” liable for damages resulting from their design, construction, operation, and maintenance.¹²

Nonstructural measures usually pose lesser risk; a “reasonableness” rather than strict liability standard is applied.

Do Tort Claim Act, Emergency Management Statutes Exempt the Activity?

All states and the federal government have adopted tort claim and emergency management statutes.¹³ These statutes limit the types of activities for which governmental units may be held liable. State statutes typically exempt a variety of nonstructural measures from suit such as emergency evacuations and certain fire and police activities.¹⁴ However, structural flood loss reduction activities are not exempted at state or local levels.

The Federal Flood Control Act of 1936 (Section 402(c)) exempts the federal government from liability for negligence in constructing and operating flood control works.¹⁵ This is an extremely important exemption and has substantially limited flood-related suits against the federal government. It does not, however, apply to state or local government activities.

How Much Discretion Is Exercised?

With some exceptions, courts do not hold governments liable for “discretionary” acts which result in flood damages.¹⁶ Courts do hold governments liable for “ministerial” acts. As will be discussed shortly, courts generally consider certain aspects of project design and implementation for both structural and nonstructural flood loss reduction measures to be discretionary such as the level of flood protection afforded and overall project design. On the other hand, courts consider actual construction, operation and maintenance, to a greater or lesser extent, ministerial and subject to liability.

¹² See Thomas, Liability for Water Control Structure Failure Due to Flooding, http://www.floods.org/PDF/NAI_Liability_Failure_Facilities_0906.pdf

¹³ See cases and discussion accompanying notes 99-104 below.

¹⁴ See, for example, *Youngblood v. Village of Cazenovia*, 462 N.Y.S.2d 526 (N.Y., 1982); *Oahe Conservancy Sub-District v. Alexander*, 493 F. Supp. 1294 (D.S.D., 1980).

¹⁵ See discussion and cases accompanying notes 48-50 below.

¹⁶ See cases and discussion accompanying notes 19-26 below.

Governments are particularly vulnerable to suite for inadequate maintenance of flood and stormwater control structures because maintenance is a “ministerial” activity.

Does Public Policy Favor Liability?

Courts consider public policy in deciding whether to hold governments or others liable for flood damages in some circumstances. For example, courts in the West have often refused to hold governments and landowners maintaining irrigation canals liable for the drowning of children based upon public policy considerations favoring irrigation.¹⁷ Similarly, a Wisconsin court refused to hold private contractors and a municipality liable for flood damages for their failed efforts to remedy “naturally” occurring flooding due to fluctuating levels of a lake because holding them liable would be against sound public policy.¹⁸

In deciding whether to impose liability upon governments which provide assistance to those who occupy hazard areas where there is no underlying duty to do so, courts and juries are faced with a dilemma. Courts and juries must apply broad rules of negligence and other theories applicable to society as a whole including situations in which it is desirable to encourage rather than discourage government assistance to hazard area occupants. Holding governments liable for assistance may discourage future government efforts to provide such assistance. On the other hand, failing to hold governments liable for negligence or other theories in such contexts leaves victims of government carelessness without a remedy and may encourage carelessness.

Table 2 Defenses

Governments may raise a variety of legal defenses in natural hazard damage related suits. Defenses vary depending upon the facts and theories or grounds for action. Defenses may include (depending upon the circumstances):

- No affirmative duty to provide protection from natural hazards,
- “Public duty” but no duty to individuals,
- Limited duty consistent with class of user on public land (e.g., trespasser versus licensee),
- Inadequate proof of causation (i.e., showing of proximate cause),
- Inadequate proof of damage,
- Sovereign immunity,
- “Governmental” rather than “proprietary” act,
- Discretionary act,

¹⁷ See, e.g., *Golding v. Ashley Cent. Irr. Co.*, 902 P.2d 142, 146 (Utah, 1995).

¹⁸ See, e.g., *Butler v. Ads*, 717 N.W.2d 760 (Wisc., 2006) (Wisconsin Supreme court held as a matter of public policy that the City of Shell Lake was not liable for gradually rising waters in Shell Lake and resulting flood damage.)

--Activity or class of government official exempted from liability by state or federal tort claims act, emergency management act,
--Action is “reasonable” in circumstances,
--Danger obvious (e.g. river in flood stage),
--Government had no knowledge of danger and should not have known,
--Waiver or assumption of liability (implied or explicit),
--Contributory negligence,
--Strict liability does not apply,
--Act of God.

LIABILITY AS RELATED TO VARIOUS STAGES OR PHASES

Liability for structural and nonstructural hazard mitigation measures (which are listed in table 1 and will be individually discussed below) may be analyzed in terms of six steps or phases of activity required for implementation of such measures. All six are not present in every implementation effort and often the steps overlap. Government actions in each of the steps have somewhat different liability implications.

These steps include: (1) the initial decision to initiate or not to initiate a mitigation measure; (2) selection of the level of protection to be afforded; (3) project design in carrying out project goals; (4) project construction; (5) project operation and/or administration; and, finally, (6) project maintenance. Each will be briefly discussed:

Decision Whether or Not to Adopt a Protection or Mitigation Measure

Courts at all levels of government have held, with few exceptions, that legislative or agency decisions **whether or not to mitigate hazards or adopt loss reduction measures** are "legislative", "discretionary", or "policy" decisions which are not in themselves subject to liability unless there is a specific statutory or regulatory requirement for specific actions. Courts have reasoned that discretionary functions do not create a duty; and, therefore, no liability follows. Governments usually have no affirmative duty to undertake reduction of naturally occurring hazards unless a special relationship exists between government and a particular individual or class of individuals (e.g., government is landowner and injured individual was invitee on public land) or a legislature has specifically mandated such protection.

Many examples can be provided where courts have held that the basic decision to protect or not protect is not subject to liability under theories of either no duty or discretionary function.¹⁹

¹⁹ See, for example, *Tri-Chem Inc. v. Los Angeles County Flood Control District*, 132 Cal. Rptr. 142 (Calif., 1976) (County has no duty to construct flood control system adequate to handle infrequent floods for area that acts as natural sump.); *Goldstein v. County of Monroe*, 432 N.Y.S.2d 966 (1980) (Municipal corporation is not liable for failing to restrain waters between banks of creek or keep channel free from obstruction it did not cause.); *Louisville v. Louisville Seed Co.*, 433 S.W.2d 638 (Ky., 1968) (City not liable for failure to place floodgate due to public duty doctrine. However, this decision was overruled in part by *Gas Service Co., Inc. v. City of London*, 687 S.W.2d 144 (Ky. 1985).

A more difficult issue arises where a legislature directs agencies or municipalities to provide certain types of services or protection from hazards, creating a general duty. Even here, however, governments may be partially protected by the "public duty" doctrine (no special duty owed to particular individuals). Courts have also generally held that an agency or municipal decision to provide those services in a particular circumstance and the nature of these services is a discretionary or policy decision, also not subject to liability.²⁰

Where courts have held that a specific duty is mandated (nondiscretionary), they have usually narrowly interpreted such a duty. For example, an Oklahoma court²¹ held that although city must maintain streets it has no legally enforceable duty to regulate traffic or provide police.

Level of Protection Selected

Courts have also held, with some exceptions, once a decision has been made to undertake a hazard reduction or a hazard loss reduction action, the degree or level of protection afforded is also a discretionary question and not subject to liability unless a particular level of protection is mandated by legislation or an agency's own guidelines. This assumes that the level of protection selected does not increase naturally occurring hazards. A detailed discussion of factors determining whether a decision would be discretionary versus operational was provided by the Supreme Court of Hawaii in *Julius Rothschild & Co. v. State*²². This decision is worth examining in some detail because it involves an interesting mitigation design question common to many mitigation contexts including both initial level of protection and retrofitting or upgrading facilities.

In this case, the court held that the state decision not to reconstruct or replace a two-span concrete bridge with the capacity to convey a 25-year storm with one which could convey a 50-year storm was a discretionary decision subject to sovereign immunity pursuant to the Hawaii State Tort Liability Act. Therefore, owners and operators of a warehouse damaged by a flash flood with a larger estimated reoccurrence interval when the bridge acted as a dam could not maintain a suit against the state. The warehouse owners did not argue that the original bridge which was constructed in 1954 to the 25-year design standard was inadequate but argued that the replacement span was inadequate in light of a hydraulic design report prepared by a firm contracted by the state prior to the reconstruction. This report had recommended replacement of the bridge deck consistent with a 50-year design frequency.

²⁰ See, for example *Commonwealth of Pennsylvania v. National Association of Flood Insurers*, 520 F.2d 11 (3rd Cir. 1975), on remand, 420 F. Supp. 221 (D.M.D. Pa. 1976) where the court held that Federal Insurance Administration (FIA) had discretion in deciding how to carry out mandate of National Flood Insurance Program enabling act that FIA publicize the program. The agency had, in fact, distributed brochures and carried out other public information activities.) For non hazard cases, see *Trujillo v. City of Albuquerque*, 603 P.2d 303 (N.M. App., 1979) (Municipality not liable for failing to provide police protection in park because police protection is a governmental function.)

²¹ See *Ochoa v. Taylor*, 635 P.2d 604 (Okla., 1981)

²² 655 P.2d 877 (Haw., 1982)

In its analysis, the court distinguished discretionary from operational level decisions. Operational level decisions not within the discretionary function exception and subject to suit were defined by the court to "generally mean those which concern routine, every day matters, not requiring evaluation of broad policy matters".²³ In contrast, discretionary decisions were defined as those in which "the decision to act or not to act involves the evaluation of broad policy factors. Such an evaluation would include a consideration of the financial, political, economic, and social effects of a given plan or policy."²⁴ In holding that the decision to rebuild or not rebuild to a particular design frequency was a discretionary decision, the court noted that "We are not here dealing with a project of relatively minor dimensions or importance...What the plaintiffs-appellants propose is the costly reconstruction or replacement of a two-span permanent concrete structure which is presently an integrated part of a heavily-traveled highway...It (such a project) would require a weighing of priorities at the higher levels of government, and would surely entail evaluations based on financial, political, and economic considerations. The Governor, for example, must decide its order of priority. The legislature must decide whether to fund the project. These would be policy decisions immune from judicial review."²⁵

Other cases have generally held the level of protection afforded by particular mitigation actions to be discretionary.²⁶

On the other hand, once a governmental unit decides to provide protection from hazards, some courts have held that the governmental unit must anticipate the negative impacts of this protection in the level of protection selected. For example, in *Barr v. Game, Fish and Parks Commission*²⁷ the Colorado Supreme Court held that the Colorado Department of Fish and Game should have anticipated flooding from a "maximum probable flood" in designing the spillway of a reservoir.

²³ Id. at 880.

²⁴ Id. at 881.

²⁵ Id. at 881.

²⁶ See, e.g., *Valley Cattle Co. v. United States*, 258 F. Supp. 12 (D. Haw., 1966). (Decision to construct culverts capable of accommodating only the waters of 2-year storms held to be a discretionary act.); *United States v. Sponenbarger*, 308 U.S. 256 (S.Ct.,1939) (Supreme Court held that when the government attempts to protect an area from a flood hazard, landowners whom the attempt fails to or cannot protect are not entitled to compensation under the Fifth Amendment.); *Wright v. United States*, 568 F.2d 153 (10th Cir., 1977) (Court held that design of highway bridge designed for a 25-year flood was a discretionary function and there was no liability when the bridge washed out in a 42-55 year storm and two occupants of a car attempting to pass over the bridge were killed.); *PDTC Owners Ass'n v. Coachella Valley Cty Water Dist.*, 443 F. Supp. 338 (D. Cal., 1978). (Court held that owners of land damaged by floods could not recover compensation from a county water district under the Fifth and Fourteenth Amendments for failure to construct a levee large enough to protect landowners from a 50-year flood. The levee which had been constructed was made of sand, was not riprapped, and provided protection only from a 30-year flood.); *Chabot v. City of Sauk Rapids*, 422 N.W.2d 708 (Minn., 1988) (City not responsible for failing to hold back water in natural holding pond to protect landowner's property despite city's engineering report that suggested the pond be increased in size.); *City of Watauga v. Taylor*, 752 S.W.2d 199 (Tex., 1988) (City undertaking storm sewer has no duty to provide facilities adequate for all floods that may be reasonably anticipated but can be held liable for negligently constructed or maintained facilities.).

²⁷ 497 P.2d 340 (Colo., 1972).

Adequacy of the Design

Certain aspects of project design such as precise location of a structure on a parcel of land are typically considered discretionary by the courts.²⁸ But other aspects of design such as the actual specifications and the materials used for a flood control structure may be "operational" or "ministerial" decisions and subject to suit if unreasonable. See, for example, *Stewart v. State*²⁹ in which the Supreme Court of Washington held that the decision to install lighting and a sign warning of narrow passage on a bridge was not a discretionary design decision but a ministerial act. The court observed that the government's decision to build the bridge, locate the bridge across the river, and designate the number of lanes might be considered discretionary but that later more detailed design was not.

Often actual design for a government mitigation measure is undertaken by a consultant engineer or engineering firm. In such circumstances, the issue is not simply the negligence of the government but the extent to which negligence of an independent contractor can be attributed to government.³⁰

When sued for negligence or breach of professional contract, engineers and architects and their government employers or contractors are generally held, at a minimum, to a standard of "reasonable care" applicable to engineers or architects in the profession. The elements of a plaintiff's action for negligence and breach of implied warranty are often the same.³¹ However, engineers and architects are not held strictly liable for any damage that may result from their work. As the Minnesota Supreme Court expressed in *City of Mounds View v. Waljarvi*³²:

²⁸ See generally *Gleason v. U.S. on Behalf of Dept. of Army Corps of Engineers*, 857 F.2d 1208 (D. Ark., 1988); *In re Ohio River Disaster Litigation*, 862 F.2d 1237 (6th Cir., 1988).

²⁹ 597 P.2d 101 (Wash., 1979). See also *Japan Air Lines Co. Ltd., v. State*, 628 P.2d 934 (Alaska, 1981) (Design of airport runway "operational" and state liable.); *Andrus v. State*, 541 P.2d 1117 (Utah, 1975) (Preparation of plans and specifications for highway and supervising work nondiscretionary where highway caused flooding.); Annot., *Government Liability--Design of Highway*, 45 A.L.R.3d 875 (1972).

³⁰ See *Japan Air Lines Co. Ltd., v. State*, 628 P.2d 934 (Alaska, 1981) (Design of airport runway "operational" and state liable.); *Andrus v. State*, 541 P.2d 1117 (Utah, 1975) (Preparation of plans and specifications for highway and supervising work nondiscretionary where highway caused flooding.); Annot., *Government Liability--Design of Highway*, 45 A.L.R.3d 875 (1972).

³¹ *Klein v. Catalano*, 437 N.E.2d 514 (Mass, 1982).

³² 263 N.W.2d 420, 424 (Minn., 1978).

Architects...engineers, and others deal in somewhat inexact sciences and are continually called upon to exercise their skilled judgment in order to anticipate and provide for random factors which are incapable of precise measurement. The indeterminate nature of these factors makes it impossible for professional service people to gauge them with complete accuracy in every instance. Thus...an architect cannot be certain that a structural design will interact with natural forces as anticipated. Because of the inescapable possibility of error which inheres in these services, the law has traditionally required not perfect results, but rather the exercise of skill and judgment which can be reasonably expected from similarly situated professionals.

Although not ordinarily the guarantor of a safe or successful project, architects and engineers must consider a variety of factual matters in specific design including the severity of the threats to health and safety which may result from the failure of a project. In addition, the design must conform with all applicable regulations.

Courts have, in most jurisdictions, held governments "strictly liable" for the failure of dams. So, the lack of negligence for the design of a dam on the part of an engineer or architect is no defense. However, strict liability has only been applied to dams and, to a lesser extent, levees. There has been a trend in the courts away from strict liability even for dams.³³

One of the most troubling issues is to what extent governments must use "state of the art" technology in various hazard mitigation measures (e.g., warning systems) as opposed to commonly used technologies. Often state of the art designs and technologies are expensive although they may decrease risks and losses. To what extent can a government balance cost with risks in the application of technologies?

In general, courts have held that selection of appropriate technology is discretionary. But some courts have held that a very high level of technology must be applied when the risks are great and improved technologies are available even though they may not be generally applied in the profession or area. For example, in *The T.J. Hooper*³⁴ a federal court of appeals held that the owner of a tug company was liable to the owner of two barges lost in a storm for failure to equip the tug boats with radios (which would have provided timely warnings of the approaching storm) although such radios were not in 1928 a common practice on tugs. The court observed that the radios could have been provided at small cost and would have been of great value. See also *Riley v. Burlington Northern, Inc.*³⁵ in which the court held that the decision of Yakima County not to install a more sophisticated warning system than a non-mechanical railroad approach warning sign at a railroad crossing was nondiscretionary and subject to potential suit for negligence.

³³ See, e.g., *Gutierrez v. Rio Rancho Estates, Inc.*, 607 P.2d 622 (N.M., 1979).

³⁴ 60 F.2d 737 (2d Cir., 1932).

³⁵ 615 P.2d 516 (Wash., 1980).

Some states have adopted statutes partially or wholly exempting government design decisions from liability under certain circumstances. For example, Cal. Govt. C. Sec. 830.6 provides that damages from design features of public improvements are not the basis for legal action if the design feature was approved in advance by the public entity exercising its discretionary authority in some explicit manner, and the choice of the design feature is supported by "substantial evidence." However, the California courts have created an exception to design immunity where "changed conditions" subsequent to the original design approval creates a dangerous condition and the public entity has constructive or actual notice of the condition.³⁶ For a case more broadly interpreting a design immunity statute to provide perpetual immunity (changed conditions are not considered) see *Lelifeld v. Johnson*.³⁷

Construction

Construction is usually considered a ministerial, nondiscretionary task and governments may be held liable for negligence of employees in actual construction or the negligence of contractors who have not been properly supervised.³⁸ See, for example, *Price v. United States*³⁹ in which a federal district court held the Corps of Engineers liable for negligence of contractor who dredged an area subject to hurricane damage, created deep hole, and failed to provide warnings.

Courts have also held municipalities liable for flood damages resulting from improperly designed storm sewer systems constructed by landowners, dedicated to the cities, and accepted by the cities. See discussion and cites below.

Operation or Administration

In general, operation or administration of a hazard mitigation measure is considered ministerial and governments are responsible for negligence. See, for example, *Valley Cattle Co. v. United States*⁴⁰ in which a district court allowed recovery against the United States for flood damage caused by the Government's negligent maintenance of a stream and culverts. However, certain operational decisions such as releases from dams have also been considered discretionary, depending upon the circumstances. For example, in *Oahe Conservancy Sub-District v. Alexander*⁴¹ a federal court held that landowners downstream of a federal dam had no right to operation of a dam in a manner to maximize benefits to them:

³⁶ See *Baldwin v. State*, 491 P.2d 1121 (Cal., 1972).

³⁷ 659 P.2d 111 (Ida., 1983).

³⁸ See generally cases cited in Annot., *Municipalities Liability Arising from Negligence or Other Wrongful Act in Carrying Out Construction or Repair of Sewers and Drains*, 61 A.L.R.2d 874 (1958); *Galluzzi v. Beverly*, 34 N.E.2d 492 (Mass., 1941) (City liable for water damage due to inadequate construction procedures for sewer.); *McNeill v. A. Teichert and Son, Inc.*, 289 P.2d 595 (Cal., 1955) (City liable for inadequate construction procedures for storm water system.).

³⁹ 530 F. Supp. 1010 (S.D. Miss., 1981).

⁴⁰ 258 F. Supp. 12 (D. Hawaii, 1966).

⁴¹ 493 F. Supp. 1294, 1297 (D. S.D., 1980)

Plaintiffs contend that they have a legal right under this statute to receive flood control benefits from these two dams, but that defendants have failed to formulate rules for the regulation of the dams for the maximum benefit possible for the plaintiffs.

.....

Plaintiffs have suggested other procedures by which these dams could be operated. It is possible that the dams could be better regulated, and that defendant's plan of operation is not the best that could possibly be designed. But under the standard of review to which this Court is limited, such possibilities have no place. A court cannot substitute its judgment for that of the agency. The standard is only whether there is a "rational connection between the facts found and the choice made". Taking all the evidence into consideration, this Court finds that rational connection exists here.

Similarly, a federal court of appeals in *In re Ohio River Disaster Litigation*⁴² held that a decision of Corps of Engineers to manage water levels and releases in reservoirs to prevent build-up of ice was a discretionary function.

Other examples of operational decisions which have often been considered discretionary include weather and flood prediction, issuance of permits, inspections, and enforcement of regulations which are discussed below.

Maintenance

In general, maintenance of a mitigation measure is considered ministerial and governmental units are responsible for negligence. For example, in *Carlotto Ltd v. County of Ventura*⁴³ a California court held a county liable for an inadequate maintenance of a debris basin. The county had failed to maintain the debris basin behind a dam with the result that only 2.5 acre feet of its entire 12.7 acre feet of water storage remained. See also *City of Prichard v. Lasner*⁴⁴ in which an Alabama court held the city liable for failure to maintain a drainage ditch resulting in flooding of leased premises. The court observed that: "One who volunteers to act, though under no duty to do so, is

⁴² 862 F.2d 1237 (6th Cir., 1988). See also *Amelchenko v. Borough of Freehold*, 201 A.2d 726 (N.J., 1964) (Decisions as to when, where, and in what priority snow-removing personnel and equipment are to be used are governmental in nature and not subject to review in court.)

⁴³ 121 Cal. Rptr. 171 (Cal., 1975). See also *Wilson v. Texas Parks and Wildlife Department*, 8 S.W.3d 634 (Tex., 1999) in which the Texas Supreme Court held the Parks and Wildlife Department potentially liable for in adequately functioning "flood early warning" system which resulted in deaths although the Department did not own the river.

⁴⁴ 406 So. 2d 990, 992 (Ala., 1981). See also *Central Nat. Ins. Co. v. City of Kansas City, Mo.*, 546 F. Supp. 1237 (W.D., Miss., 1982) (City could be held liable for failure to maintain natural watercourse which the city adopts as part of its drainage system.); *True v. Mayor & Commissioners of Westernport*, 76 A.2d 135 (Md., 1950). (City liable for negligence in failing to keep sewer in proper repair.); *Lott v. City of Daphne*, 539 So. 2d 241 (Ala., 1989) (If city begins to use natural gully as part of stormwater drainage system, city must exercise due care in preventing erosion damage to adjoining properties.)

thereafter charged with the duty of acting with due care and is liable for negligence in connection therewith.”

On the other hand, in some instances, courts have held that governmental units are not liable for inadequate maintenance because it is a "discretionary" or governmental function. See, for example, *Slemp v. City of North Miami*⁴⁵ in which a Florida court held that the city was not liable for flooding caused by failure to maintain stormwater pumps because this was held to be a discretionary function and subject to sovereign immunity. Courts have also refused to hold governments liable for failure to maintain facilities where there is an inadequate showing of negligence or causation.⁴⁶

LIABILITY FOR STRUCTURAL HAZARD REDUCTION MEASURES

We will now consider government liability for individual types of structural and nonstructural hazard reduction and loss reduction measures. We will begin with a discussion of structural hazard reduction measures.

As already discussed above, many successful liability suits for government “mitigation” measures have involved blockage of flood flows or drainage by roads, bridges, grading or fills or the design, operation, or maintenance of structural hazard reduction measures such as dikes, dams, levees, ditches, stormwater management facilities, groins, and sea walls. These measures may increase hazards on some lands while reducing it on others, particularly when design frequencies are exceeded or structures are not adequately maintained. Landowners damaged by increased hazards may sue governments based upon nuisance, trespass, violation of riparian rights, strict liability, and inverse condemnation theories. The large number of successful suits pertaining to structural measures reflects the high residual risks associated with flood and erosion control measures.

As noted above, governmental units have not generally been held liable for failing to provide structural hazard mitigation altogether or for selecting one level of protection rather than another. They have been held liable for inadequate design, construction, operation, and (especially) maintenance of structures which increase natural hazard damages on private property. This is particularly true for high risk structures such as dams. Even where there is a trend away from strict liability for construction and maintenance of dams, courts often hold governmental units to a very high standard of care due to the high risks.

Most the cases cited above dealing with design, construction, operation and maintenance address structural flood loss reduction measures. Although many successful suits deal with state or local liability for flood control structures, it is to be noted again that the federal government is, in general, not responsible for damages for federal flood control works due to the section 702c exemption contained in the Flood Control Act of

⁴⁵ 515 So. 2d 353 (Fla., 1987).

⁴⁶ See, e.g., *E.B. Metal and Rubber Industries, Inc. v. County of Washington*, 513 N.Y.S.2d 293 (N.Y., 1987) (Plaintiff proved negligence in maintenance of town dike but failed to show that such negligence was the proximate cause of flood damages.)

1936. Since many flood control structures are cooperative efforts between the federal government and states or local governments, it is not surprising that states and local governments often argue that federal immunity extends to them when they are sued for negligence. Such arguments have prevailed in some but not all instances. See, e.g., *Florida East Coast Railway Company v. U.S.*⁴⁷ in which a federal court of appeals held that a flood control district was liable for damages to railroad due to improper maintenance of federal flood control levee. The flood control district had worked with the Corps in planning the project, reviewed the plans, was responsible for the alignment of the project, and provided advice and assistance to the Corps in construction including a 15 percent cost share. Contractors who construct flood control structures for the federal government may also claim "shared" immunity in some circumstances.⁴⁸

Although the federal government is not in general responsible for flood losses, federal agencies may be liable in a specific case for structures which have incidental flood control benefits but are designed and operated primarily for navigation, recreation, or other purposes.⁴⁹

LIABILITY FOR NONSTRUCTURAL FLOOD LOSS REDUCTION MEASURES

There have been far fewer successful suits with nonstructural flood loss reduction measures. We will first discuss nonregulatory nonstructural measures and then regulatory measures.

Flood/Weather Prediction

A small number of cases have dealt with government liability for various types of flood hazard predictions. Most of these cases have involved weather or flood forecasts, as discussed below. Apparently, no court to date has held a governmental unit liable for errors in prediction, per se, due in part discretionary exceptions to negligence in the federal Tort Claims act and similar state tort claim acts and to the large amount of discretion which must be exercised in making predictions. Examples of cases addressing predictions include *National Manufacturing Co. v. United States*⁵⁰ in which a court of appeals held that the National Weather Bureau could not be sued for inadequate predictions and for disseminating erroneous flood and weather information. The court based its rejection of the claim upon a variety of grounds including the "discretionary" function exemption, the "misrepresentation" exemption, and 702c of the Flood Control Act of 1928. See also *Brown v. United States*⁵¹ in which another federal court of appeals

⁴⁷ 519 F.2d 1184 (5th Cir., 1975)

⁴⁸ See, e.g., *Portis v. Folk Const. Co., Inc.*, 694 F.2d 520 (8th Cir., 1982) (Contractor constructing a flood control structure for the Corps shared federal government immunity when flood damages resulted from that structure.)

⁴⁹ *Denham v. United States*, 646 F. Supp. 1021 (D. Tex., 1986) (Immunity does not apply to management of recreational facilities in a park.); *Arkansas River Corp. v. U.S.* (D. Miss., 1996) (Immunity does not apply to operation of lock and dam for navigation purposes.)

⁵⁰ 210 F.2d 263 (8th Cir., 1954) cert. denied, 347 U.S. 967 (S.Ct., 1954)

⁵¹ 790 F.2d 199 (1st Cir., 1986). See also *Chanon v. United States*, 350 F. Supp. 1039, 1041 (S.D. Tex. 1972) (Court concluded that "(w)eather predictions cannot be given the character of established facts" and held that there was no liability for inadequate predictions.)

held that the National Oceanic and Atmospheric Administration's (NOAA) could not be sued for failure to predict a hurricane on the Outer Banks with resulting loss of life where the lack of an operating weather buoy may have contributed to this lack of predictive capability. The Court relied on the "discretionary" exemption with the rationale that predicting storms requires a great deal of discretion and interpretation and that plaintiff had not shown that the prediction would have been any different had the buoy been operating.

Dissemination of Hazard Information

Although courts have not held governments liable for inaccurate predictions of hazard events, courts in several cases have held governmental units responsible for inadequate dissemination of hazard information. Dissemination is more of a ministerial act than prediction. See, for example, *Pierce v. United States*⁵² in which a court of appeals held that "(s)ince the FAA has undertaken to advise requesting pilots of weather conditions, thus engendering reliance...it is under a duty to see that the information which it furnishes is accurate and complete." See also *Weese v. Village of Medina*⁵³ in which a New York court held that the city was liable for giving out misinformation concerning existence of sewer next to building.

However, other courts have held that dissemination of information falls within the discretionary exception. See, for example, *Channon v. United States*⁵⁴ in which a federal district court held that the Weather Service was not liable for failing to predict hurricane or distribute warnings. See also *City of Tarpon Springs v. Garrigan*⁵⁵ in which a Florida court held that a city not liable as the result of building inspector furnishing homeowner incorrect information regarding federal flood insurance since this was discretionary function.

Warning Signs, Warning Systems, Other Warnings

Warnings may or may not be part of a formal warning system. Warnings concerning floods may take a number of different forms including posting of warning signs, distribution of booklets and other printed materials, word of mouth direct warnings, warnings via radio or television, and the use of sirens. It is difficult to generalize concerning public liability for inadequate warnings because liability depends upon whether public or private land is involved, the status of the entrant on the land, the

⁵² 679 F.2d 617, 621 (6th Cir., 1982). See also *Connelly v. State*, 84 Cal. Rptr. 257, 263 (Cal., 1970) in which a California Court of Appeals held that the State of California Department of Water Resources might be liable for alleged negligence in calculating and disseminating information concerning flood heights.

⁵³ 443 N.Y.S.2d 529 (N.Y., 1981). See also *Brown v. MacPherson's, Inc.*, 545 P.2d. 13 (Wash., 1975) (Cause of action existed against the State of Washington where an avalanche expert told a state employee that cabins located in a development project were in a high risk avalanche area, that the employee led the expert to believe that the state would warn residents in the area, that the expert refrained from warning residents based upon this representation, and the state employee did not convey avalanche danger information to the resident.)

⁵⁴ 350 F. Supp. 1039 (D. Texas, 1972).

⁵⁵ 510 So. 2d 1198 (Fla., 1987).

relationship between the government entity and the injured party, whether government has helped create or increase the hazard, and other factors. Liability for warnings will also depend upon a state's tort claim or emergency management statute. For example, a Hawaii court in *Dyniewicz v. County of Hawaii*⁵⁶ held that the County of Hawaii was not subject to a suit for inadequate flood warnings and resulting deaths pursuant to an emergency management statute (Hawaii Revised Statutes, #128-18) which relieved the state and political subdivisions for liability for disaster relief functions.

Absent a statute mandating warnings or a special relationship creating a duty, governments have no general duty to warn private landowners or members of the public using private hazard prone lands. But governments do have a duty, in some instances, to warn employees and members of the public using hazardous public lands. Governments have, in general, a duty to avoid willful and wanton conduct which will injure a trespasser and a limited duty to warn trespassers on public lands of known hazards. Governments have a stronger duty to "licensees" to warn of known dangers. Government has a duty to "invitees" to actively investigate (in some instances) and provide warnings for hidden hazards or to remedy the hazards. Government must use ordinary and reasonable care to keep premises safe.

Although a governmental unit ordinarily has no general duty to warn, conduct by an official which creates a special relationship with an individual may create such a duty. See, for example, *Brown v. MacPherson's*⁵⁷ in which a Washington court held that a state employee who agreed to warn others of avalanche danger but failed to do so was liable.) In addition, a government may be liable if it decides to warn but fails to adequately do so. See, for example, *Wilson v. Texas Parks and Wildlife Department*⁵⁸, in which a Texas court held that the Parks and Wildlife Department was potentially liable for inadequately functioning "flood early warning" system which resulted in deaths.

The issue of duty to warn depends upon the courts characterization of the government's actions as discretionary versus ministerial in a particular instance. How a court will characterize a specific action is not easy to predict. See, for example, *Judd v. U.S.*⁵⁹ in which a federal district court held that the Forest Service's decision not to post warning signs at waterfall in national forest 1/4 mile from campground and not accessible was discretionary. But see *Mandel v. United States*⁶⁰ in which a federal court of appeals held that the Park Service was liable for failure to warn of hidden rocks in stream used for swimming and diving.

⁵⁶ 733 P.2d 1224 (Haw., 1987).

⁵⁷ 545 P.2d 13 (Wash., 1975.).

⁵⁸ 8 S.W.3d 634 (Tex., 1999).

⁵⁹ 650 F. Supp. 1503 (S.D. Cal., 1987).

⁶⁰ 793 F.2d 964 (8th Cir., 1986).

Courts have held that a “storm in progress” doctrine applies to warnings for snow or ice whereby a public or private landowner has no duty to warn or to take reasonable measures to remedy a storm-created snow or ice condition until a reasonable time after a storm has ceased.⁶¹

Courts are particularly likely to find a government has a duty to warn where a government has created or increased a hazard by a government act or omission.⁶² Where the defendant has created the dangerous situation, the failure to warn may be considered actionable negligence.⁶³

Where hazards are obvious on public lands, courts have generally held that governments have no duty to warn.⁶⁴

Whether or not a governmental unit has a duty to warn in a specific instance, courts have overall held that once governmental units have decided to warn, they must exercise reasonable care in doing so.⁶⁵

This duty to use care in warnings has been extended to the prediction process in a few cases. See, e.g., *Pierce v. United States*⁶⁶ in which a court of appeals held that “(s)ince the FAA has undertaken to advise requesting pilots of weather conditions, thus engendering reliance...it is under a duty to see that information which it furnishes is accurate and complete.” See also *Brown v. United States*⁶⁷ in which a federal district court held that the National Oceanographic and Atmospheric Administration could be sued for failure to predict a hurricane on the Outer Banks with resulting loss of life where the lack of maintenance of a weather buoy may have contributed to this lack of predictive capability. This decision was reversed on appeal because the appellate court found that there was insufficient evidence that lack of the weather buoy would have changed the

⁶¹ See e.g., *Wheeler v. Grande’ Vie Senior Living Community*, 819 N.Y.S.2d 188 (N.Y., 2006); *Brierley v. Great Lakes Motor Corp.*, 837 N.Y.S.2d 451 (N.Y., 2007).

⁶² See Annot., *Liability of United States for Failure to Warn of Danger or Hazard Resulting From Governmental Act or Omission as Affected by ‘Discretionary Function or Duty’ Exception to Federal Tort Claims Act*, 65 A.L.R. Fed 358 (1983).

⁶³ See, *Price v. United States*, 530 F. Supp. 1010 (S.D. Miss., 1981) (Court held the federal government liable for drowning caused by dredging in area filled by sediment by a hurricane.)

⁶⁴ See, for example, *Hall v Lemieux*, 378 So. 2d 130 (La., 1979) (Board of commissioners had no duty to warn of dangers of swimming in bayou next to recreation area although board (allegedly) had knowledge of prior drownings in the bayou.); *Gemp v. U.S.*, 684 F.2d 404 (6th Cir., 1982) (Decision to post warnings around dam was discretionary with Corps; also, Corps had no duty to warn of open and obvious danger.); *Hall v. United States*, 647 F. Supp. 53 (C.D. Ill., 1986) (Federal government not liable for failure to provide warning of danger of waterfall since danger was open and apparent.); *Henretig v. United States*, 490 F. Supp. 398 (S.D. Fla., 1980) (Federal government not liable for undeveloped national park trail and failure to post warning signs; the dangers of steepness and loose ground were obvious.)

⁶⁵ See *Anello v. Town of Babylon*, 533 N.Y.S.2d 284 (N.Y., 1988) (Posting of “diving in diving area only sign” and posting of depths were sufficient warnings.). They must use care in hazard prediction, the content of the warning, and the methods used to deliver the warning (e.g. flashing lights, sirens, etc.) including maintenance of equipment.

⁶⁶ 679 F.2d 617, 621 (6th Cir., 1982).

⁶⁷ 615 F. Supp. 391 (D. Mass., 1984).

weather prediction which was based upon a broad range of sources of information.⁶⁸ But, had this broader information base not existed in the case, the appellate court might well have sustained the lower court decision.

In many situations, hazard warnings are not based upon predictions of specific events such as approaching storms but rather records of historical hazard events or more general knowledge concerning hazards. The issue, then, in such contexts, is whether the government unit received actual knowledge of a dangerous condition or should have carried out investigations to discover the dangerous condition and then provided warnings.

The adequacy of the content and type of warning is also at issue in some cases. The nature of the warning needed in a particular instance depends, in particular circumstances, upon the type of hazard, the seriousness of the hazard, the type of users of the area (e.g., children versus adults) and other factors. See, for example, *Coates v. United States*⁶⁹ in which a federal district court held that the Park Service could be held liable for death of camper at Rocky Mountain National Park due to flooding from a dam despite warnings from a Park Service employee. The court held that the warnings did not convey an adequate sense of urgency concerning the situation. See also *Piggott v. United States*⁷⁰ in which a federal court of appeals held that the federal government was potentially liable for drowning of two children at historical beach park despite two signs warning that swimming was dangerous due to strong undercurrents and deep holes but there was no lifeguard, tow line, depth marker, safety line or other safety equipment. But see *Rubenstein v. United States*⁷¹ in which a federal district court that there was no federal liability for bear attack in national park where tourists were provided with brochures containing warnings, signs were posted with warnings and there were also direct warnings. The court observed that “Warnings as to known physical dangers such as those in various thermal areas are, of course, required. But warnings as to unanticipated earthquakes, lava flows, and landslides should not be.”

Courts have also held governments liable in a few cases for failure to maintain warning devices. In the best known of these cases, *Indian Towing Co. v. United States*,⁷² the U.S. Supreme Court held that the Government was liable to the owner of a vessel which was grounded and damaged as the result of the failure of a light negligently maintained by the Coast Guard. The Court held that the Coast Guard did not need to undertake the lighthouse service:

⁶⁸ See *Brown v. United States*, 790 F.2d 199 (1st Cir., 1986).

⁶⁹ 612 F. Supp. 592 (D. Ill., 1985).

⁷⁰ 480 F.2d 138 (4th Cir., 1973).

⁷¹ 338 F. Supp. 654, 657 (D. Cal., 1976).

⁷² 350 U.S. 61, 69 (S.Ct., 1955).

But, once it exercised its discretion to operate a light...and engendered reliance on the guidance afforded by the light, it was obligated to use due care to make certain that the light was kept in good working order; and, if the light did become extinguished, then the Coast Guard was further obligated to use due care to discover this fact and to repair the light or give warning that it was not functioning. If the Coast Guard failed in its duty and damage was thereby caused to petitioners, the United States is liable under the Tort Claims Act.

See also *Bevilaqua v. United States*⁷³ in which a federal district court held that failure of federal employee to light seven kerosene lanterns at navigational lock was nondiscretionary and subjected federal government to liability where two drownings occurred due to a boat colliding with and plunging over 18 foot dam late at night.)

Flood Maps

Government hazard maps may, if inaccurate, mislead landowners and banks and encourage them to make unsound investment decisions. On the other hand, hazard maps are useful in warning public and private landowners of potential hazards even if they do contain inaccuracies. Maps are also useful to define areas subject to regulatory jurisdiction. Even if carefully prepared, maps like warnings are somewhat speculative and inaccurate because they often must be based upon limited historical information and model output. Tradeoffs are also necessary between accuracy and scale and the costs of mapping. Because of the inherent inaccuracies and the tradeoffs which must be made in mapping, courts have been reluctant to hold governmental units liable for map inaccuracies. Examples of cases in which no liability was found include *State ex rel. Pitz v. City of Columbus*⁷⁴ in which an Ohio court held that zoning restrictions precluding property owner from building on his property based on erroneous floodway map did not constitute a taking. See also *Britt v. United States*⁷⁵ in which a Federal district court held that property owners had no claim of negligence against the U.S. for preparing and disseminating inaccurate flood maps due to “flood control” exemption in Federal Tort Claims Act.

Hazard Mitigation Planning and Evacuation Planning

⁷³ 22 F. Supp. 493 (D. Pa., 1954).

⁷⁴ 564 N.E.2d 1081 (Ohio, 1988).

⁷⁵ 515 F. Supp. 1159 (D. Ala., 1981). See also ; *Baroni v. U.S.*, 662 F. 2d 287 (5th Cir., 1981). (Court held that FHA was not liable to purchasers of subdivision housing units for miscalculation of 50 year flood height in approving plans for a subdivision due to the “flood control” exemption); *Ravalese v. Town of East Hartford*, 608 F. Supp. 575 (D. Conn., 1985) (Landowner did not have a Constitutionally protected right to have his property excluded from floodplain zone where FEMA map excluded property but town zoning map included property in floodplain); *Ahern v. Fuss & O’Neill, Inc.*, 78 Conn. App. 202 (Conn., 203) (Court dismissed a Section 1983 due process claim when a town employee provided incorrect 100 year flood elevation to a developer. The flood elevation had changed because FEMA had revised its flood map because the map had erroneously listed a lower elevation due to a technical error in preparing the map.)

Government liability predicated upon the absence of a hazard mitigation plan or the inadequacy of such a plan has been litigated in some cases. In *Coates v. United States*⁷⁶ a federal district court held the National Park Service was liable for providing inadequate warnings in the 1982 flash flood at Estes Park. It also held that the Service had failed to develop an adequate plan for warning and evacuating people in the Park in the event a crisis arose.” The court stated:⁷⁷

Because these national parks are outdoors and, therefore, subject to extreme and sometimes unexpected weather changes, structural failures such as the one at issue here, other flash floods, and major fires which occur, changes may be sudden and dramatic (because of acts of God or foibles of man). Therefore, the Government, in creating this relationship with citizens, also creates a duty to itself to develop orderly procedures for dealing with emergencies. It is imperative to have a plan in place because in such situations there is little time for reflection. Priorities should be established before an emergency arises; otherwise personnel are unprepared to deal with them.

See also *Ducey v. United States* in which a federal court of appeals held that the ⁷⁸ Park Service was possibly liable for failing to warn of or guard against flash flooding.

Courts have, in some instances, required planning to alleviate known hazardous highway conditions. For example, in New York it has long been held that a municipality “owes to the public the absolute duty of keeping its streets in a reasonably safe condition.” See *Friedman v. State of New York*⁷⁹ in which the court addressed the role of transportation planning. The court observed that ⁸⁰

In the field of traffic design engineering, the State is accorded a qualified immunity from liability arising out of a highway planning decision...

....

Under this doctrine of qualified immunity, a government body may be held liable when its study of a traffic condition is plainly inadequate or there is no reasonable basis for its traffic plan...Once the State is made aware of a dangerous traffic condition it must undertake reasonable study thereof with an eye toward alleviating the danger. Moreover, after the State implements a traffic plan it is “under a continuing duty to revise its plan in the light of actual operation”...

....

When...analysis of a hazardous condition by the municipality results in the formulation of a remedial plan, an unjustifiable delay in implementing the plan constitute a municipality’s duty to the public just as surely as if it had totally failed to study the known condition in the first place.

⁷⁶ 612 F. Supp. 592 (D. Ill, 1985).

⁷⁷ Id. at 596.

⁷⁸ 713 F.2d 504 (9th Cir., 1983).

⁷⁹ 67 N.Y.2d 271, 283 (N.Y., 1986).

⁸⁰ Id. at 283-286, case citations omitted.

See also *Dubacs v. State*⁸¹ in which a New York court held that the State was liable for failing to correct an icy road condition on a bridge and that this was a recurrent and unusually severe condition of which the state had notice. The court held that: “It was shown that the State did not adopt and implement a reasonable plan for dealing with that specific hazard....” On the other hand a municipality may defend itself if it adopts a traffic plan which is reasonable and based on adequate study.⁸²

Some states such as Texas require that communities prepare hazard mitigation plans “for its area providing for disaster mitigation, preparedness, response, and recovery.” See Texas Code Annot., Gov’t Code Ch. 418.106 It may be argued that these statutes create a duty to prepare such plans although an individual injured by a natural hazard would need to show that the statute was intended to benefit his or her particular class of individuals and that he or she qualified as a member of that class.⁸³ Whether the content of the plans would be subject to suit is another matter since most planning decisions are discretionary. See, for example, *Dalehite v. United States*⁸⁴ in which the U.S. Supreme Court held that discretionary functions include “determinations made by executives or administrators in establishing plans, specifications, or schedules of operations. Where there is room for policy judgment and decision there is discretion.”

Evacuation from an area prior to or during a disaster pursuant to an emergency management plan might, potentially, lead to liability if an evacuation plan was seriously flawed and injuries resulted or, more likely, if injuries resulted from inadequate implementation of a plan. However, the content of evacuation plans would, presumably, enjoy “discretionary” function immunity like other hazard mitigation plans. For example, in *Cougar Business Owners Association v. State*⁸⁵ the Washington Supreme Court held that the Washington State governor’s evacuation planning and decision to evacuate the area around Mt. St. Helens were immune from suit.

Implementation of an evacuation plan may result in injuries not only due to the natural hazards but traffic accidents caused by government emergency vehicles. On the other hand, courts have held that government action in an emergency is subject to a lower standard of care than if no emergency exists. See discussion and cases cited below. Some states statutorily exempt emergency management activities from liability. See, for example, *Cubit v. Mahaska County*⁸⁶ in which the court held a suit by a police officer seeking damages for county negligence resulting in an automobile accident was barred by Iowa’s emergency response statute.

⁸¹ 529 N.Y.S.2d 643 (N.Y., 1988).

⁸² See *Lifson v. City of Syracuse*, 838 N.Y.S.2d 323 (N.Y., 2007).

⁸³ See generally *Trujillo v. City of Albuquerque*, 603 P.2d 303 (N.M., 1979).

⁸⁴ 346 U.S. 15, 36, 37 (S.Ct., 1953).

⁸⁵ 647 P.2d 481 (Wash., 1982) cert. denied 459 U.S. 971 (S. Ct., 1982).

⁸⁶ 677 N.W.2d 777 (Iowa, 2004).

Emergency Services and Emergency Management

Governments provide a broad range of emergency services during and immediately after a natural disaster. These may include helicopter or boat rescue, traffic control, medical services, ambulance services, clearing roads of debris, fire-fighting, and emergency shelter and food.

Governments, in general, have no duty to provide emergency services unless they are required to do so by statute. However, if governments attempt to provide assistance, they are, in general, held to the same standard of “reasonable” conduct (absent an emergency services state tort claim exemption) as private individuals. The Washington Supreme Court in *Brown v. MacPerson’s, Inc.*⁸⁷ stated the general rule with regard to rendering aid in emergency contexts:⁸⁸

One who undertakes, albeit gratuitously, to render aid to or warn a person in danger is required by our law to exercise reasonable care in his efforts, however commendable...If a rescuer fails to exercise such care and consequently increases the risk of harm to those he is trying to assist, he is liable for any physical damage he causes.

The care which governments and individuals must exercise in an “emergency” is less than when no emergency exists since government employees must make decisions quickly in the face of emergency and the standard for “reasonableness” is the action of a hypothetical individual performing in an actual emergency situation. See, *Jones v. Munn*⁸⁹ in which an Arizona court held that the “sudden emergency” doctrine applies where individual is “suddenly confronted with imminent peril.” Governmental units are not responsible for foreseeing or acting to avoid highly speculative dangers.⁹⁰

Courts have quite often refused to hold governmental units liable for failing to provide effective emergency services based upon a variety of theories: government actions were exempted by tort claim or emergency management acts; actions were “governmental” in nature and therefore subject to a sovereign immunity defense, or, the government acted reasonably under the “emergency” conditions. For examples of cases in which courts have refused to hold government units liable see *Valevais v. City of New Bern*⁹¹ in which a North Carolina court held that a municipality was immune from suit for injuries resulting from its negligence or nonfeasance in fire fighting because this function is essentially “governmental” in scope. See also *Westbrooks v. State*⁹² in which a California court held that a county was not liable for a death which occurred when heavy rains and flooding caused a highway bridge to collapse and the county sheriff set up a traffic control point 1.3 miles from the bridge but the deceased drove through the

⁸⁷ 545 P.2d 13 (Wash., 1975).

⁸⁸ Id. at 18.

⁸⁹ 681 P.2d 368 (Ariz., 1984).

⁹⁰ See *City of Sarasota v. Eppard*, 455 So. 2d 623 (Fla., 1984) (City not liable for failing to foresee “highly unusual, extraordinary, or bizarre consequences”).

⁹¹ 178 S.E.2d 109 (N.C., 1970).

⁹² 219 Cal. Rptr. 674 (Cal., 1985).

control point and plunged into the river. The court held that there was no proof that the county's action had increased the actual risk of harm or the deceased had relied on the county's action, creating a "special relationship".

In general, governments have no duty to rescue and one rescuer has no duty to another rescuer except to avoid affirmative misconduct.⁹³ See, for example, *Decher v. City of Imperial Beach*⁹⁴ in which a California court held that a city was not grossly negligent in rescue attempts for surfer although rescue workers used disfavored surf rescue methods. However, when a governmental official requests assistance of a private citizen in performance of his duties, he or she owes the citizen due care.⁹⁵

In some instances private citizens are injured as a result of ambulance/car crashes, or fire-fighting in disaster contexts. The general tort rule is that, in the absence of an emergency (or a specific tort claim exemption), a police officer or other government worker is subject to the same standard of due care as any other driver.⁹⁶ However, normal speed limits do not apply to emergency vehicles, provided the drivers of the vehicles sound their sirens and use their flashing lights.⁹⁷

Most states have adopted statutes specifically exempting municipalities and its agencies for certain types of liability claims based upon emergency services. For example, Alaska Stat. Sec. 09.65.070(d)(5) immunizes municipalities and its agents from claims "based upon the exercise or performance of a duty or function upon the request of, or by the terms of an agreement or contract with the state to meet emergency public safety requirements." See also Cal. Civ. Code. #1714.5 which immunizes disaster service workers for services ordered by lawful authorities during a state or emergency. Utah Stat. #63-30d-201 retains government immunity for any injury or damage resulting from the implementation or the failure to implement measures to "respond to a national, state, or local emergency...." Nevada Revised Statutes #414.110) provides:

All functions under this chapter and all activities relating to emergency management are hereby declared to be governmental functions. Neither the State nor any political subdivision thereof nor other agencies of the state or political subdivision thereof...is liable for the death of or injury of persons, or for damage to property, as a result of any such activity.

The Nevada Supreme Court considered the scope of this statute as applied to pre-disaster activities in a series of flood cases which illustrate the difficulties courts are having in deciding what is in an "emergency" and when protected activities begin. The

⁹³ See *Sawicki v. Village of Ottawa Hills*, 525 N.E.2d 468 (Oh., 1988).

⁹⁴ 257 Cal., Rptr. 356 (Cal., 1989).

⁹⁵ See, e.g., *Walker v. Los Angeles County*, 238 Cal. Rpt. 146 (Cal., 1987).

⁹⁶ See *Romero v. Richfield*, 253 N.W.2d 152 (Minn., 1977).

⁹⁷ But see *Fiser v. City of Ann Arbor*, 339 N.W.2d 413 (Mich., 1983). (Police officers have a duty to drive in a reasonable manner even if it is determined that a statute provides general immunity from tort liability for operation of emergency vehicles) However this case was partially overruled on other grounds by *Robinson v. City of Detroit*, 613 N.W.2d 307 (Mich., 2000)).

court first interpreted this statute in *Nylund v. Carson City*⁹⁸. In this case, flooding had damaged the plaintiff's condominium during the winter of 1996-1997. The landowner claimed that Carson City was liable for this flood damage because the city had routed flood waters down a street. The city claimed that it was not liable because its activities were exempted from liability by the state emergency management statute. The court agreed with the city and held that the emergency management statute covered "not only negligent emergency management, but also any previous negligence that contributed to the damage caused by the emergency management activities." The Court held that the city was not liable because flooding of the condominium was due to emergency measures involving the channelization of flood waters down a street and not due to design defects in the storm drainage system. In a later flood case, the court attempted to clarify the pre-emergency activities covered by the emergency management statute and held in *Vermeff v. City of Boulder City*⁹⁹ that a government entity "is not immune from liability for its pre-emergency negligence that is not intertwined with damage caused by later negligent emergency management activities." With this reasoning, the court held that the city might be held liable for flood damages due to faulty construction of a drainage channel, constructed before the emergency existed but contributing to the flooding. Finally, in *ASAP Storage v. City of Sparks*,¹⁰⁰ the court partially overruled these two earlier cases and broadly held that whether a pre-emergency negligence is immune "turns solely on whether it was undertaken by the government in preparing for an emergency." But the court also held that the city of Sparks was potentially liable for "gross negligence, willful misconduct, or bad faith." In this case the City had prevented a landowner from entering an area prior to a flood. The landowner was, therefore, unable to remove materials which were damaged by flooding.

The Hawaii court of appeals held in *Dyniewicz v. County of Hawaii*¹⁰¹ that an emergency management statute (Hawaii Revised Stat. §§127-7) immunized the state and any political subdivision from personal injury claims arising during performance of civil defense functions whenever the state or political subdivision was engaged in disaster relief functions whether or not the governor has issued a disaster proclamation. The court held that pursuant to this statute the county could not be sued for (allegedly) inadequate flood warning signs.

Similarly, in *Castile v. Lafayette City*¹⁰² a Louisiana court held that the immunity provision in the Louisiana Homeland Security and Emergency Assistance and Disaster Act (See La. R.S. 29:735) in some depth and absolved Lafayette City of legal responsibility for damages and injuries caused when employees put hurricane debris from Hurricane Lili at a road intersection and a traffic accident resulted. The court concluded that the Act covered not only preparedness but "response to and recovery from emergencies or disasters". However, another Louisiana court held the immunity

⁹⁸ 34 P.3d 578, 581 (Nev., 2001).

⁹⁹ 80 P.3d 445, 447 (Nev., 2003).

¹⁰⁰ 173 P.3d 734, 744 (Nev., 2007).

¹⁰¹ 733 P.2d 1224 (Haw., 1987).

¹⁰² 896 So.2d 1261 (La., 2005), writ denied 05-0860, 902 So.2d 1029 (La., 2005).

provisions of this Act did not extend in time beyond the Governor's declaration of emergency.¹⁰³

Training

Individuals injured by government flood-related activities may argue that injuries have been the result of improper training of governmental officials. The U.S. Supreme Court has recognized inadequate police training as the basis for Section 1983 civil rights liability where inadequate training amounts to "deliberate indifference" to Constitutional rights.¹⁰⁴ However, for a successful Section 1983, the plaintiff must prove a Constitutional violation by the persons being trained or supervised.¹⁰⁵ Almost all successful cases involving allegations of inadequate training have involved police actions such as false arrests, false imprisonment, malicious prosecution, assault and battery. Successful suits have involved egregious situations and not mistakes, lack of expertise, or lack of overall competence.¹⁰⁶ As stated by the court in *Starstead v. City of Superior*¹⁰⁷:

Liability has attached only when "The failure to supervise or the lack of proper training program was so severe as to reach the level of "gross negligence" or "deliberate indifference to the deprivation of the plaintiff's constitutional rights."

For this reason, lack of training has apparently not succeeded as the ground for liability in any natural hazard suit to date. See, for example, in *Lee v. Town of Estes Park, Colo.*,¹⁰⁸ a federal court of appeals held that the city of Estes Park was not liable under Section 1983 for failure to adequately train police officer for actions following the Lawn Lake flood. But, given the increasingly technical nature of hazard prediction, mapping, evacuation and other mitigation measures, allegations of lack of technical training may in the future be considered a contributing factor to "unreasonable conduct" suits based upon negligence even if it is not an adequate basis alone for a Section 1983 suit.

Intentional Destruction of Private Property During or After a Disaster

Courts have traditionally held that governments may, in some very limited circumstances, destroy private property during a disaster to prevent the spread of fire, or flood or may require the razing or raze private structures which are dangerous after a disaster without paying just compensation. Most of these cases have involved destruction of buildings during fires. However, government agencies breach levees with increasing frequency to provide additional flood storage or conveyance for urban areas with

¹⁰³ See *Clement v. Reeves*, 935 So.2d 279 (La., 2006).

¹⁰⁴ See *Canton v. Harris*, 489 U.S. 378 (S.Ct., 1989) in which the Court held that inadequacy of training may serve as the basis for 1983 municipal liability.

¹⁰⁵ See *Ricciuti v. N.Y.C. Transit Authority*, 124 F.3d 123 (2nd Cir., 1997).

¹⁰⁶ See *Wedgeworth v. Hams*, 592 F. Supp. 155 (D. Wis., 1984) in which the court rejected a 1983 claim based upon allegedly inadequate screening, training and supervision because acts of city and agents were quasi-judicial and discretionary.).

¹⁰⁷ 533 F.Supp. 1365 (D., Wis., 1982) citing *Owens v. Haas*, 601 F.2d 1242, 1246 (2nd Cir., 1979)

¹⁰⁸ 820 F.2d 1112 (10th Cir., 1987).

resulting destruction of buildings and infrastructure. Such levee breaches may also result in law suits.

Courts have been reluctant to allow destruction in an emergency without compensation unless there is a compelling and well-documented reason related to public health and safety. Courts have emphasized that governments must be able to prove that the structures are nuisances or pose a threat to safety. See, for example *Boland v. City of Rapid City*¹⁰⁹ a federal district court held the city of Rapid City had the power to destroy flood damaged private houses after the Rapid City Flood of 1972 to prevent a public disaster or abate a nuisance hazardous to the public health, safety or welfare but city had burden to prove that destruction was required. The city had not done this and was liable for a “taking”.

In *Oswalt v. County of Ramsey*¹¹⁰ a Minnesota court held that a landowner was entitled to compensation when a county refused to permit repair of a flood-damaged house. The house was valid nonconforming use under ordinance but county had failed to consider “useful life” of proposed improvement for purpose of amortization and had instead, in effect, condemned the house by refusing to issue a building permit.

Emergency Shelters

Governmental units often designate public or private buildings as emergency shelters (flood, hurricane, tornado, earthquake). Injuries could result if a building was unable to withstand a natural hazard event or injuries occurred in the shelter during or after a natural hazard event.

No court has apparently held a government liable for the failure of an emergency shelter. In addition, a court would likely characterize designation of a structure as an emergency shelter as “discretionary”, particularly if the government unit warned that it did not insure the safety of the structure and that the structures should only be used as a “last resort”. However, “unreasonable” operation of the shelter might result in a successful negligence suit if not exempted from suit by a state emergency management act such as Cal. Civ. Code. #1714.5.

GOVERNMENT LIABILITY FOR REGULATING PRIVATE DEVELOPMENT

“Taking” Without Payment of Just Compensation

Landowners in some instances claim that floodplain regulations violate their Fifth and Fourteen Amendments rights by taking their private property without payment of just compensation. They may raise the taking issue with hazard-related zoning, subdivision

¹⁰⁹ 315 N.W.2d 496 (S.D., 1982). See also *Rose v. City of Coalinga*, 190 Cal. App. 3d 1627, 236 Cal. Rptr. 124 (Cal., 1987) (Court noted that governments have the power to damage or destroy private property in emergency situations (here after earthquake damage) but the power may be exercised only when such destruction is proven necessary.

¹¹⁰ 371 N.W. 2d 241 (Minn., 1985).

controls, building and housing codes, special public safety codes and a variety of special permit requirements (e.g., erosion area, floodway, dune setbacks). Regulatory taking claims also overlap, somewhat, with tort negligence claims in regulatory permitting, enforcement, and inspections discussed in below.

Landowners have succeeded in establishing an uncompensated “taking” in only a very small number of cases. An extensive discussion of the taking issue is beyond the scope of the paper.¹¹¹ Nevertheless, we will provide a brief summary.

Factors Considered Be the Courts; Tests for Taking

In deciding whether an uncompensated taking has occurred, courts consider a number of factors and apply a series of tests.¹¹²

--Impact on the landowner. Courts typically focus first on the impact of the regulations on the landowner. They determine whether plaintiff in fact owns the property in question or otherwise has an adequate property interest to challenge the regulations.¹¹³ They examine the nature of this ownership interest (i.e., Is it qualified by “public trust” or “nuisance” considerations?)¹¹⁴ They determine whether there has been any “physical” taking of the landowner’s property and therefore a “categorical” taking.¹¹⁵ They determine the economic impact of the regulations on the property and the diminution in value.¹¹⁶ They determine whether the regulations deny all economic use of lands. If so, they generally hold that there is a “categorical” taking (with some important exceptions).¹¹⁷ Courts also determine the extent to which the regulations interfere with landowner distinct investment backed expectations.¹¹⁸

--Balancing public needs and private rights. Assuming that there is no categorical taking due to physical taking or due to denial of all economic uses, courts balance public rights/needs and private interests.¹¹⁹ In this balancing, they take into account the impact on the property owner (see list of considerations above) and the “character of the government action”. Principle factors considered by the courts in examining the character of the government action include the regulatory goals, the relationship between the goals and the regulations, whether there is any physical interference with private lands, the extent to which landowners are singled out, and other factors.

¹¹¹ See generally Kusler and Thomas, No Adverse Impact Floodplain Management and the Courts http://www.floods.org/PDF/ASFPM_NAI_Legal_Paper_1107.pdf; Thomas and Medlock, Mitigating Misery: Land Use and Protection of Property Rights Before the Next Big Flood, Vermont J. Env. L. 155 (2008).

¹¹² See *Lingle v. Chevron U.S.A., Inc.*, 544 U.S. 528 (S.Ct., 2005) for a summary of tests.

¹¹³ See *Phillips Petroleum Co. v. Mississippi*, 484 U.S. 469 (S.Ct., 1988).

¹¹⁴ See, e.g., *McQueen v. South Carolina Coastal Council*, 580 S.E.2d 116 (S.C., 2003).

¹¹⁵ See, e.g., *Loretto v. Teleprompter Manhattan CATV Corp.* 458 U.S. 419 (S.Ct., 1982).

¹¹⁶ See, e.g., *Penn Central Transp. Co. v. New York City*, 438 U.S. 104, 124 (S.Ct., 1978).

¹¹⁷ See e.g., *See Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1015 (S.Ct., 1992).

¹¹⁸ See, e.g., *Penn Central Transp. Co. v. New York City*, 438 U.S. 104, 124 (S.Ct., 1978).

¹¹⁹ See *Penn Central Transp. Co. v. New York City*, 438 U.S. 104, 124 (S.Ct., 1978); *Agins v. City of Tiburon*, 447 U.S. 255 (S.Ct., 1980).

Courts in a small number of older cases have held that hazard regulations were a taking based upon the impacts upon landowners alone because regulations denied all economic use or were a physical taking.¹²⁰

As far as the author could determine, no court has held that hazard regulations are a taking in apply the balancing of public and private interests test for taking.

Regulatory Contexts

Courts have sustained floodplain regulations against takings challenges in a broad range of contexts:

1. Challenges to “performance standard” hazard regulations. Such challenges have uniformly failed¹²¹ because performance standard regulations do not prohibit structures outright in hazard areas but require that landowners refrain from activities which will increase hazards on other lands (e.g., blockage of a floodway) and incorporate hazard-reduction measures in new buildings. Such regulations do not prevent all economic use of private land. At most, they limit the types of use that may be made of the land and affect the construction costs.

2. Challenges to denials of permits pursuant to performance standard regulations. Courts have also broadly upheld denials of individual permits or variances or refusal to approve subdivisions against claims of taking.¹²²

3. Challenges to conditions attached to the approval of permits for development in the floodplain including “in lieu fee” or dedication requirements. Courts have upheld the conditional approval of permits or subdivision plats against takings challenges, providing the conditions are reasonable.¹²³ Conditions may include installation of stormwater

¹²⁰ See, e.g., *Morris County Land Imp. Co. v. Parsippany-Troy Hills Tp.*, 193 A.2d 232 (N.J., 1963) (Court invalidated in total a wetland/floodplain conservancy district which permitted no economic uses where the district was primarily designed to preserve wildlife and flood storage.)

¹²¹ See, e.g., *Responsible Citizens v. City of Asheville*, 302 S.E.2d 204 (N.C., 1983) (Court upheld performance standard floodplain regulations as not a taking.); *Rolleston v. State*, 266 S.E.2d 800 (Ga., 1980) (Court held that Georgia's Shore Assistance Act requiring permits for altering the shore is valid and not on its face a taking.)

¹²² See, e.g., *Smith v. Town of Mendon*, 822 N.E.2d 1214 (N.Y., 2004) (Court of appeals held that no taking occurred when the town conditioned site plan approval upon the filing of conservation restrictions for floodplain and erosion areas included in an environmental protection overlay district.); *Vartelas v. Water Resources Comm'n.*, 153 A.2d 822 (Conn., 1959) (Court held that denial of a single permit with a particular design and construction materials pursuant to a Connecticut state level floodway program was not a taking.); *Creten v. Board of County Commissioners*, 466 P.2d 263 (Kan., 1970) (Court sustained denial of county permit for mobile home park in an industrial area subject to odor nuisances and flooding.); *Falcone v. Zoning Board of Appeals*, 389 N.E.2d 1032 (Mass, 1979) (Court held that zoning board of appeals did not exceed its authority in denying subdivision application for failure to comply with floodplain ordinance.); *Kraiser v. Zoning Hearing Board*, 406 A.2d 577 (Pa., 1979) (Court upheld decision of zoning board of township denying a variance for a duplex residential dwelling in a 100-year floodplain conservation zone based upon substantial evidence of drainage and flooding problems and the possibility of increasing hazards to other buildings.)

¹²³ See, e.g., *Smith v. Town of Mendon*, 822 N.E.2d 1214 (N.Y., 2004) (Court of appeals held that no

drainage and detention facilities, protection of floodway conveyance capacity, and design and installation of roads designed to provide access during floods. Courts have also upheld open space reservation or dedication requirements although the Supreme Court in several cases has held invalid dedication requirements opening private lands to public use as not sufficiently related to or proportional to the impacts of the proposed activities.¹²⁴

On the other hand, courts have disapproved conditions as a violation of due process or, in some instances, as a taking where the statute or ordinance did not expressly authorize such conditions, the conditions were unreasonable (not related to the regulatory goals), or the condition was not proportional to and specifically related to the impact of the proposed use.¹²⁵

4. Challenges to delays in issuance of building permits, temporary moratoria on building or subdivision of lands in a hazard area, or moratoria on rebuilding after a disaster. Modest delays in issuing building permits in hazardous areas have consistently been held not to be a taking where the delays have been for good reasons and permit issuance not indefinitely prolonged.¹²⁶ Moratoria on development for specific periods of time have also been sustained in a variety of hazard contexts.¹²⁷

taking occurred when the town conditioned site plan approval upon the filing of conservation restrictions for floodplain and erosion areas included in an environmental protection overlay district.); *Longridge Estates v. City of Los Angeles*, 6 Cal. Rptr. 900 (Calif., 1960) (Court held that city could reasonably charge subdivider for connection to use municipal storm drains and sewers where fees went exclusively for the construction of outlet sewers.); *City of Buena Park v. Boyar*, 8 Cal. Rptr. 674 (Calif., 1960) (Court upheld condition that \$50,000 be paid by developer to permit municipal construction of a drainage ditch to carry away surface waters from subdivision as a reasonable condition for subdivision plat approval.); *County Council for Montgomery County v. Lee*, 148 A.2d 568 (Md., 1959) (Court held that county could require that subdivider obtain drainage easements for construction of storm drainage outlet and file a performance bond to assure that the easements would be acquired.); *Board of Supr's of Charlestown Tp., v. West Chestnut Realty Corp.*, 532 A.2d 942 (Pa., 1987) (Court held that denial of subdivision approval because a detailed stormwater plan was not provided was valid.)

¹²⁴ See note 125, below.

¹²⁵ The U.S. Supreme Court in *Nollan v. California Coastal Commission*, 483 U.S. 825 (S.Ct. 1987) held unconstitutional as a denial of due process and a taking the conditioning of a permit by the California Coastal Commission for expansion of a coastal residence upon dedication of an easement by the landowner to permit public use of the beach. The Court in this decision concluded that the conditions did not have a reasonable relationship to the goals of the regulation. See also *Dolan v. City of Tigard*, 512 U.S. 374 (S.Ct., 1994) in which the Supreme Court held that city regulations for the 100 year floodplain which required a property owner to donate a 15 foot bike path along the stream were not reasonably related to the flood loss reduction goals of the regulation and were, therefore, a taking. The Court stated that the municipality had to establish that the dedication requirement had "rough proportionality" to the burden on the public created by the proposed development. This case along with *Nolan* suggests that governmental units need to be particularly careful in imposing public access dedication requirements and make sure they are proportional to burdens.

¹²⁶ See, e.g., *C & D Partnership v. City of Gahanna*, 474 N.E.2d 303 (Ohio, 1984) (Delay in processing subdivision permit due to potential flood problems not a taking.)

¹²⁷ See, e.g., *Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency*, 535 U.S. 302 (S.Ct., 2002) (Court upheld Tahoe Regional Planning Agency temporary ordinances which had applied for 32 months to "high hazard" (steep slope) zones near Lake Tahoe against a claim that the ordinances were a taking of private property.); *First English v. County of Los Angeles*, 258 Cal. Rptr. 893 (1989) (On remand from the Supreme Court, the California court held that, as a matter of law, the Los Angeles County's interim floodplain regulation was not a taking.); *Cappture Realty Corp. v. Board of Adjustment*, 313 A.2d

5. Challenges to prohibition of construction in relatively narrow, high risk areas which often encompass only portions of lots. Courts have broadly upheld highly restrictive setbacks and other regulations for limited, high risk areas including floodways, erosion area setbacks, and dune regulations.¹²⁸

6. Challenges to highly restrictive regulations for broader hazard areas often encompassing whole properties. Courts have, with a few exceptions, sustained hazard regulations restricting larger areas to open space uses where they have found some economic use for lands.¹²⁹ Several older, contrary cases exist, however, but in these cases the courts found that no economic use existed for the regulated lands and there was no showing that proposed uses would cause safety threats or cause nuisances.¹³⁰

624 (N.J., 1973) (Court upheld interim zoning ordinance declaring a moratorium on construction in flood-prone area until a flood control plan could be prepared unless special exception permits were obtained. The moratorium had been adopted in October 1971 and extended for yearly periods until November 1974.); *Lindquist v. Omaha Realty, Inc.*, 247 N.W.2d 684 (S.D., 1976) (Court held that resolution of Rapid City Council which prohibited issuance of building permits for one block on either side of Rapid Creek after devastating flood of 1972 a valid exercise of police powers.)

¹²⁸ See, e.g., *Wyer v. Board of Environmental Protection*, 747 A.2d 192 (Me. 2000). (Court held that denial of variance under sand dune laws not a taking because property could be used for parking, picnics, barbecues and other recreational uses.); *Hall v. Board of Environmental Protection*, 528 A.2d 453 (Me., 1987) (Court held that sand dune law was not a taking despite a prohibition of year-round structures since the owner could live in or rent out spaces for motorized campers connected to utilities.); *Spiegle v. Beach Haven*, 218 A.2d 129 (N.J., 1966) (Court sustained dune and fence ordinances for a beach area subject to severe storm damage where buildings had been destroyed in a 1962 storm. The regulation effectively prevented all building or rebuilding on several lots. The Court held that the plaintiff had not met his burden in proving a taking because the plaintiff had failed to prove "the existence of some present or potential beneficial use of which he has been deprived." *Id.* at 137.); *Usdin v. State Dept. of Environmental Protection*, 414 A.2d 280 (N.J., 1980); affirmed at 430 A.2d 949 (N.J., 1981) (Court upheld against takings challenge state floodway regulations prohibiting structures for human occupancy, storage of materials, and depositing solid wastes because of threats to occupants of floodway lands and to occupants of other lands.); *Maple Leaf Investors, Inc. v. The State Dept. of Ecology*, 565 P.2d 1162 (Wash., 1977). (Court upheld denial of a permit for proposed houses in floodway of the Cedar River because there was danger to persons living in a floodway and to property downstream.)

¹²⁹ See, e.g., *Gove v. Zoning Board of Appeals of Chatham*, 831 N.E.2d 865 (Mass., 2005) (Court held that zoning board's denial of a residential building permit for a parcel of land located within a coastal conservancy district was not a taking because it did not deny the landowner all economically beneficial use of land and did not deprive her of distinct investment backed expectations.); *Bonnie Briar Syndicate, Inc. v. Town of Mamaroneck, et. al.* 721 N.E.2d 971 (N.Y., 1999) (Court rejected as a taking rezoning of 150 acre golf course property from residential to recreational use. A portion of this property was within the floodplain of the Sheldrake River and according to the court "the land helps control flooding by acting as a natural detention basin for rising water due to storms."); *Turnpike Realty Co. v. Town of Dedham*, 284 N.E.2d 891 (Mass., 1972), cert. denied, 409 U.S. 1108 (1973) (Court upheld zoning regulations essentially limiting the floodplain to open space uses despite testimony that the land was worth \$431,000 before regulations and \$53,000 after regulation.); *Krahl v. Nine Mile Creek Watershed District*, 283 N.W.2d 538 (Minn., 1979). (Court held that watershed district's floodplain encroachment regulations limiting fill to 20% of a floodplain property and affecting 2/3 of an 11 acre tract were not a unconstitutional taking.)

¹³⁰ See, for example, *Morris County Land Imp. Co. v. Parsippany-Troy Hills Tp.*, 193 A.2d 232 (N.J., 1963) (Court invalidated in total a wetland conservancy district which permitted no economic uses where the district was primarily designed to preserve wildlife and flood storage.); *Dooley v. Town Plan & Zoning Comm'n*, 197 A.2d 770 (Conn., 1964) (Court held that open space floodplain zoning ordinance which denied all economic use of specific land was a taking.)

TORT LIABILITY FOR FAILING TO ADEQUATELY REGULATE FLOOD PRONE AREAS

Landowners damaged by natural hazards caused by the failure of governmental units to adequately administer or enforce regulations sometimes sue governmental units for such inadequacies. Most but not all of these suits have failed.

Failing to Regulate

In general, governmental units have no duty to adopt regulations (absence a legislative mandate requiring adoption) and no liability results from failure to adopt a regulation. See, for example, *Hinnigan v. Town of Jewett*¹³¹ in which a New York court held that State of New York was not liable for failing to assure the participation of towns in the National Flood Insurance Program and, similarly, that the town of Jewett was not liable for failing to meet the minimum federal standards of the NFIP thereby making flood insurance available in the town. The Court held that “no special relationship” existed between the state and landowner who had initiated the suit and that “...failure of the town to comply with Federal regulations was a mere withholding of a benefit.”¹³²

See also *Carpenter v. Scherer-Mountain Ins. Agency*¹³³ in which the court held that Lawrence County was entitled to a sovereign immunity defense in a suit by a landowner who had suffered flood damage and sued the county for negligence in failing to devise, implement, and enforce floodplain regulations programs in conformance with the National Flood Insurance Program (NFIP). The landowner argued that once the County agreed to join the National Flood Insurance Program it had a duty to implement that decision in a nonnegligent manner. Specifically, the landowner argued that county had failed to carry out two “mandatory” NFIP requirements: hiring a floodplain administrator and implementing a permit program to scrutinize development in the floodplain. But the court rejected these arguments and held that the sovereign immunity defense applied because the County’s actions were “governmental” in nature.

On the other hand, a Georgia Court in *Columbus, Ga. v. Smith*,¹³⁴ held that the Columbus was liable for failing to put limits on the increased amount of water which developers were allowed to run off into Bull Creek after complaints from landowners about periodic flooding and erosion of their properties. In addition, in another Georgia case, *City of Columbus, Ga. v. Myszka*¹³⁵ the court held the city of Columbus was liable for allowing uphill development approved and accepted by the city to increase the volume of water flowing through a stream and ditch with resulting flooding. This water included sewage. The court allowed punitive damages.

¹³¹ 94 A.D.2d 830 (N.Y., 1983).

¹³² *Id.* at 831.

¹³³ 733 N.E.2d 1196 (Ohio, 1999). See also *Central Nat. Ins. Co. v. City of Kansas City, Mo.*, 546 F. Supp. 1237 (Mo., 1982) (Court that the city had no liability for failing to regulate development which may have exacerbated flooding because regulation is a government function.).

¹³⁴ 316 S.E.2d 761 (Ga., 1984).

¹³⁵ 272 S.E.2d 302 (Ga., 1980).

The legislatures in some states like Minnesota have adopted statutes requiring local governments to adopt floodplain regulations.¹³⁶ These statutes create a duty to adopt regulations and might serve as the basis for suit if regulations were not then adopted and damages resulted. In *NRCD v. NYSDEC*¹³⁷ a federal district court held the state of New York was liable for failing to adopt air pollution regulations as required by federal statute. However, the National Flood Insurance statute does not mandate community or state adoption of floodplain regulations and states or communities who enter the National Flood Insurance Program may drop out at any time.¹³⁸

Failing to Adequately Consider Natural Hazards in Permitting

Many courts have held governmental units liable under negligence, trespass, water law theories for issuing permits or approving subdivisions where such approval results in substantial physical flood, erosion, or landslide hazard damage to other lands. The decisions turn upon a number of considerations: the water law rules in the state (e.g., common enemy, “reasonable use”), the degree of government involvement and control, and who owns the lands at the time of suit (e.g., government versus private). The decisions also turn upon statutory or regulatory provisions which may (or may not) create a regulatory duty to consider natural hazards in permitting and the precise language of the state tort claim act.

In *Hurst v. U.S.*,¹³⁹ a federal district court held the Corps of Engineers liable for issuing a Section 404 permit for construction of jetties in the White River. The jetties were not constructed as called for in the permit and blocked flows in the river. As a result, a landowner was seriously flooded. The Corps knew that Hurst was violating the permit issued to him and the Corps violated its own regulations by failing to issue an order prohibiting any further work by Hurst on the project despite many requests by the landowner who was damaged. The district court initially held that the landowner could not sue the Corps pursuant to the Federal Tort Claims Act. On appeal the Eighth Circuit reversed the dismissal and remanded the case for findings on the claim that the Corps caused Hurst’s damages by negligently failing to issue a prohibitory order.¹⁴⁰ On remand to the district court, the district court observed that “the Corps’ regulations governing issuance of permits for projects in navigable waterways also indicates that the Corps should be concerned with minimizing the risks of flooding on surrounding property.”¹⁴¹ The court found that:¹⁴²

Because the Hursts were included in the class of persons meant to be offered some protection from flooding under the federal regulations governing the Corps,

¹³⁶ See, e.g., *County of Ramsey v. Stevens*, 283 N.W. 2d 918 (Minn., 1979).

¹³⁷ 668 F. Supp. 848 (D. N.Y., 1987).

¹³⁸ See *United States v. St. Bernard Parish*, 756 F.2d 1116 (5th Cir., 1985).

¹³⁹ 739 F. Supp. 1377 (D., 1990).

¹⁴⁰ See *Hurst v. United States*, 882 F.2d 306 (8th Cir., 1989).

¹⁴¹ 739 at 1380.

¹⁴² *Id.* at 1381, 1382).

the Corps' failure to enforce its own regulations amounts to negligence per se under South Dakota law.

Courts in many other cases have held governmental units liable or potentially liable for issuing permits or approving subdivisions:¹⁴³

On the other hand, a comparable number of courts have held that governments not liable for flooding or other natural hazard damages caused by issuance or denial of building permits or subdivision approval because issuance is a discretionary or governmental function or because "permitting" was expressly exempted from liability by a state tort claim act.¹⁴⁴

¹⁴³ See, e.g., *Eschete v. City of New Orleans*, 245 So.2d 383 (La., 1971) (Court held that city could be held liable for approving subdivision which overtaxed drainage system and caused flooding.); *Pennebaker v. Parish of Jefferson*, 383 So.2d 484 (La., 1980) (Court held that parish could be held liable for increased flooding by allowing street improvements, building construction and street drainage without taking steps to prevent flooding.); *Sheffet v. County of Los Angeles*, 84 Cal. Rptr. 11 (Cal., 1970) (Court held that county was liable when it approved subdivision and accepted dedication of road facilities which resulted in flood and erosion damages.); *Frustuck v. City of Fairfax*, 28 Cal. Rptr. 357 (Cal., 1963) (Court held that city was liable in inverse condemnation for having approved subdivisions and accepted drainage easements and having diverted increased waters onto private property.); *Yue v. City of Auburn*, 4 Cal. Rpts.2d 653 (Cal., 1992) (Court held that city was potentially liable for approving subdivision which increased impervious surfaces without upgrading downstream stormwater facilities to convey increased flows.); *City of Keller v. Wilson*, 86 S.W.3d 693 (Tex., 2002) (City was liable for approving subdivisions based upon city's drainage plan but then failing to acquire 2.8 acres to implement the plan. This was partially reversed by *City of Keller*, 168 S.W.3d 802 (Tex., 2005); *City Keller v. Wilson*, 2-00-183-CV (Tex., App. 2007); *Harris Cty. F. Con. V. Adam*, 56 S.W.3d 665 (Tex., 2001) (Court held that Harris County Flood Control District was potentially liable for approval of a highway project (Beltway 8) which flooded private property.); *Kite v. City of Westworth Village*, 853 S.W.2d 200 (Tex., 1993) (Court held that a "taking" without payment of just compensation potentially occurred where city approved a plat resulting in a diversion of water from its natural course and resulting damage.); *County of Clark v. Powers*, 611 P.2d 1072 (Nev., 1980); (Court applied a "reasonable use" rule for surface waters and held city liable for increased flooding due to urbanization and city's flood control activities); *Columbus Ga. V. Smith*, 316 S.E.2d 761 (Ga., 1984) (Court held the city liable for approving construction projects and other actions resulting in flooding of private property.); *Pickle v. Board of County Comm'r of County of Platte*, 764 P.2d 262 (Wyo., 1988) (Court held that county had duty to exercise reasonable care in reviewing subdivision plan and was potentially liable in negligence for flooding and problems with waste disposal because of a failure to use such care.); *Peterson v. Oxford*, 459 A.2d 100 (Conn., 1983) (Court held town liable for having accepted roads and drainage system including drainage easement in subdivision with resulting flooding.); *Wilson v. Ramacher*, 352 N.W.2d 389 (Minn. 1984) (Court held city potentially liable for inverse condemnation for increasing flooding by approval and acceptance of subdivision plats with associated drainage facilities although the city was not liable for permitting fill and approving and accepting plats as of plats under a negligence theory of action or pursuant to a "reasonable use" surface water law rule in Minnesota.); *Myotte v. Mayfield*, 375 N.E.2d 816 (Oh., 1977) (Court held city liable for flooding when it approved plans for storm sewers for an industrial park which increased the amount and acceleration of stormwater in a natural watercourse.); *Docheff v. Broomfield*, 632 P.2d 69 (Colo., 1980) (Court held city liable for flooding due to accepting streets and storm drains and approving subdivision and drainage plans. Court issued an injunction.); *Hutcheson v. City of Keizer*, 8 P.3d 1010 (Ore., 2000) (Court held that city could be held liable for city engineer's and public works director's inadequate review of drainage basin analysis and design plans for subdivision for conditions of subdivision approval and subsequent flooding and that such review was not discretionary.)

¹⁴⁴ See Annot., "Liability of Governmental Entity for Issuance of Permit for Construction Which Caused or Accelerated Flooding", 62 A.L.R.3d 514 (1975). This is no longer the majority rule but has been applied by courts in a fair number of cases. See *Wilcox Associates v. Fairbanks North Star Borough*, 603 P.2d 903

It is to be noted that some of cases were decided based upon the “common enemy” or a comparable doctrine for surface waters.¹⁴⁵ This doctrine has been replaced by a “reasonable use” doctrine in most states and the outcome might well be different if the issues were litigated today.

(Alaska, 1979) and cases cited therein; *Ferentchak v. Village of Frankfort*, 475 N.E.2d 822 (Ill., 1985). An Illinois court in *Ferentchak* (supra) held that a village was not liable in regulating development for failing to establish adequate grade levels for residences to prevent flooding. The court (Id. at 827.) quoted from a Minnesota case in explaining its rationale (Citing *Hoffert v. Owatonna Inn Towne Motel, Inc.*, 199 N.W.2d 158, 160 (Minn., 1972):

Building codes, the issuance of building permits, and building inspections are devices used by municipalities to make sure that construction within the corporate limits of the municipality meets the standards established. As such, they are designed to protect the public and are not meant to be an insurance policy by which the municipality guarantees that each building is built in compliance with the building codes and zoning codes. The charge for building permits is to offset expenses incurred by the city in promoting this public interest and in no way an insurance premium which makes the city liable for each item of defective construction in the premises.

For other cases see *Cootey v. Sun Investment, Inc.*, 718 P.2d 1086 (Haw., 1986) (County not liable for having approved subdivision plans including drainage plans where flooding resulted. Court held that there was no breach of duty of care.); *Okie v. Village of Hamburg*, 609 N.Y.S.2d 986 (N.Y., 1994) (Village not liable for mistakenly issuing building permit and certificate of occupancy for structure in the floodplain because no special relationship existed between city and landowner and only a “public duty” existed between the village and the landowner.); *Johnson v. County of Essex*, 538 A.2d 448 (N.J., 1987) (No township liability for approving plats and building permits which increased flow of water under pipe due to statutory design immunity and discretionary immunity.); *Darst v. Metropolitan St. Louis Sewer Dist.*, 757 S.W.2d 270 (Mo., 1988) (Sewer district not liable for allowing private filling of floodplain where this was permitted by the common enemy doctrine.); *Patterson v. City of Bellevue*, 681 P.2d 266 (Wash., 1984) (City not liable for increased flow due to urbanization despite adoption by city of a storm water ordinance.); *Loveland v. Orem City Corp.*, 746 P.2d 763 (Utah, 1987) (City not liable for approval of subdivision plat without requiring fencing of canal where child subsequently drowned.); *Ullery v. Contra Costa County*, 248 Cal. Rptr. 727 (Cal., 1988) (Approval of permits and subdivision approval does not result in liability for landslide where local government refused dedication of natural creek as part of a drainage system. There was also insufficient evidence that erosion in creek had caused the slide.); *Bargmann v. State*, 600 N.W.2d 797 (Neb., 1999) (Court held that approval of plat and failure to enforce floodplain ordinance was not a regulatory taking. City had not been involved with the construction, development, or maintenance of subdivision.); *Kemper v. Don Coleman, Jr. Builder, Inc.*, 726 So.2d 11 (La., 2000) (Court held that parish was not liable for approving a subdivision subject to flooding where subdivision was in compliance with floodplain regulations.); *E.B. Metal & Rubber Industries, Inc., v. State*, 444 NYS 2d 319 ALSO 84 Ad 2D 659 (N.Y., 1981); (Court held that there was no state liability for failing to enforce conditions on permit for dike.); *Yox v. City of Whittier*, 227 Cal.Rptr. 311 (Calif., 1986) (Court held that there was no city liability for surface runoff caused by private development where city had only issued permits and approved subdivision and construction on a private street was private.); *Hibbs v. City of Riverdale*, 478 S.E.2d 121, 122 (Ga., 1996) (Court observed that the sole act of approving a construction project which leads to an increase in surface water runoff cannot impose liability for creating or maintaining a nuisance. The court further observed however that:

(W)here a municipality negligently constructs or undertakes to maintain a sewer or drainage system which causes the repeated flooding of property, a continuing, abatable nuisance is established, for which the municipality is liable (quotation marks and citations omitted).

¹⁴⁵ See, e.g., *Darst v. Metropolitan St. Louis Sewer Dist.*, 757 S.W.2d 270 (Mo., 1988).

Likely courts will increasingly hold governmental units liable for approving permits or subdivisions as more precise flood data becomes available for not only to major floods along main stem rivers and streams but smaller tributaries and stormwater systems. With such data available, communities can no longer argue that they are unaware of flood and erosion problems caused by development. In addition, computerized flood and erosion models now allow landowners damaged by increased flood or stormwater flows to calculate the effects specific structures, fills, and drainage works have on flood heights and velocities and erosion. This facilitates proof of damage and causation and avoids the sort of evidentiary problems illustrated by *Provost v. Gwinnett County*¹⁴⁶ in which a Georgia court held that the county was not liable for approving upstream property development because the jury found insufficient connection between development of upstream property and damage to downstream property.

Courts have also held governments liable in some cases to permittees for erroneous issuance of building permits inconsistent with ordinance standards.¹⁴⁷ See, for example, *Radach v. Gunderson*¹⁴⁸ in which a Washington court held a city liable for expense of moving house which did not meet zoning setback requirements constructed pursuant to a permit issued by city.

Some states such as Alaska, California, New Jersey and Utah have adopted statutes immunizing from liability permit issuance and inspections (including both failure to adequately inspect and for health and safety violations that may exist on property after inspections).¹⁴⁹

Acceptance of Dedicated Storm Sewers, Street, Other Facilities

Most courts which have considering the issue have held governmental units responsible for flood damages due to government regulatory approval of privately constructed storm sewers, and other flood-related facilities which were then dedicated to governmental units by subdividers, accepted by the governmental units, and then operated by government units. See for example *Phillips v. King County*¹⁵⁰ in which the court held that county actions in regulating development and enforcing drainage restrictions alone do not give rise to liability but active public use and maintenance of drainage facilities may. See *Blau v. City of Los Angeles*¹⁵¹ in which the court held the city potentially liable under a theory of inverse condemnation for approving and accepting dedication of subdivision improvements and subsequent maintenance of an

¹⁴⁶ 405 S.E.2d 754 (Ga., 1991).

¹⁴⁷ See cases cited in "Municipal Tort Liability for Erroneous Issuance of Building Permits: A National Survey," 58 Wash. L. Rev. 537 (1983).

¹⁴⁸ 695 P. 2d 128 (Wash., 1985).

¹⁴⁹ See Alaska Stat. # 09.65.070; Cal. Govt. C. ## 818.4, 818.6; N.J.S.A. ## 59:2-5, 59.2-6; Ut. C ## 63-30d-301. See, e.g., *Pinkowski v. Town of Monclair*, 691 A.2d 837 (N.J., 1997) (Court held that town subdivision approval for lot with underground cement pipe or culvert created no liability because state tort claim act barred claims based on issuance of permits.)

¹⁵⁰ 968 P.2d 871 (1998).

¹⁵¹ 107 Cal. Rptr. 727 (Calif., 1973)

area that resulted in landslide. See also *City of Columbus v. Myszka*¹⁵² in which the court held that there was a continuing, abatable nuisance by city for approving and accepting uphill subdivision which caused flooding.¹⁵³

However, a smaller number of courts have refused to find cities liable¹⁵⁴.

Inadequate Inspections

Traditionally, failure of governments to carry out building inspections or negligence in such inspections was not subject to suit because inspections were either considered “governmental” or “discretionary” in nature or subject to the “public duty” doctrine. See, for example, *Stemen v. Coffman*¹⁵⁵ in which a Michigan court held city inspections and failure of city to require owners of multi-dwelling unit to abate alleged nuisance due to inadequate fire protection devices was discretionary; *Pierce v. Spokane County*¹⁵⁶ in which a Washington court held that a city was not liable under the “public duty” doctrine for negligent inspections; *Dinsky v. Framingham*¹⁵⁷ in which a Massachusetts court held that a city was not liable for negligent inspection where requirements pertaining to grading and proper drainage for flood area were not met. There was no special duty owed the landowner. In addition, many states such as Kansas, Alaska, California and Utah have adopted statutes specifically immunizing building inspection activities from suit. See, e.g., K.S.A. 75-6104.

¹⁵² 272 S.E.2d 302 (Ga., 1980).

¹⁵³ See also *Powell v. Village of Mt. Zion*, 410 N.E.2d 525 (Ill., 1980) (Court held that once village approves and adopts sewer system constructed by subdivision developer, village may be held liable for damage caused by it.); *City of Watauga v. Taylor*, 752 S.W.2d 199 (Tex. 1988) (Court held that city was not liable for approving plat for subdivision which increased flooding but held that city could be liable for an improper construction or maintenance of drainageway donated to and accepted by the city.); *Albers v. County of Los Angeles*, 398 P.2d 129 (Cal., 1965) (Court held that county was liable for inverse condemnation judgments aggregating \$5,360,000 for landslide damage caused by public placement of fill and landowner could recover not only difference in fair market value before and after slide but cost of stopping slide.); *ABC Builders, Inc. v. Phillips*, 632 P.2d 925 (Wyo., 1981) (Evidence of city's failure to maintain a drainage ditch was sufficient to establish city's liability for resulting landslide.); *Barnhouse v. City of Pinole*, 183 Cal. Rptr. 881 (Calif., 1982) (City and state were potentially liable for nuisance for inadequate drainage system which was approved and accepted by city.).

¹⁵⁴ See, e.g., *Jennings v. Wessel Const. Co., Inc.*, 428 N.E.2d 646 (Ill., 1981) (City not liable for accepting defective sewer system.); *M.H. Siegfried Real Estate v. City of Independence*, 649 S.W.2d 893 (Mo., 1983) (City cannot be required to construct culverts to facilitate the flow of surface water when it assumes maintenance of streets possibly built by others.); *Martinovich v. City of Sugar Creek, Mo.*, 617 S.W.2d 515 (Mo., 1981) (City not responsible for sewer and catch basin constructed by private developer and never accepted by the city.); *Hibbs v. City of Riverdale*, 490 S.E.2d 536 (Ga., 1997) (City not responsible for flooding due to dedicated drainage system because city never exercised “dominion” and “control” over the system.); *Sousa v. Siler Development Company*, 210 Cal. Rptr. 146 (Cal., 1985) (City not liable for accepting drainage systems because there was no evidence that system had increased flooding.)

¹⁵⁵ 285 N.W.2d 305 (Mich., 1979).

¹⁵⁶ 730 P.2d 82 (Wash., 1986). See also *Stone, F.F. & A. Renker, Jr.*, “Government Liability for Negligent Inspections”, 57 Tul. L. Rev. 328 (1982); “Annot. Liability of Municipal Corporation for Negligent Performance of Building Inspectors Duties”, 41 A.L.R.3d 567 (1972).

¹⁵⁷ 438 N.E.2d 51 (Mass., 1982).

But some courts have held governmental units responsible for inadequate inspections. See, for example, *Tuffley v. City of Syracuse*¹⁵⁸ in which a New York court held that a city was held liable based upon a theory of inverse condemnation for acts of city engineer in failing to adequately inspect building site and determine that culvert running under site was part of a city storm water drainage system. The court held that a “special relationship” existed here. See also *Brown v. Syson*¹⁵⁹ in which an Arizona court held that home purchaser’s action against city for negligent inspection of home for violations of building codes was not barred by doctrine of sovereign immunity and public duty doctrine. See *Brand v. Hartman*¹⁶⁰ in which a Michigan court held that negligent performance of housing inspection pursuant to an ordinance requiring certificate of approval for which fee was charged by city was not a governmental function so as to render city immune from liability. See *Trianon Park Condominium Ass’n, Inc. v. City of Hialeah*¹⁶¹ in which a Florida court held that a condominium association had cause of action against city for negligent inspections after roof of building which was subject to construction defects fell in after heavy rainstorm. Court held that inspections were nondiscretionary pursuant to tort claim act. The court observed that “(o)nce the City undertook to inspect, review and certify construction, it was obligated to do so reasonably and responsibly in accordance with acceptable standards of care.”

Inadequate Enforcement of Regulations

As with permit issuance and inspections, courts have generally considered enforcement of regulations a discretionary function and not subject to suit.¹⁶² However, as with negligent inspections, courts have held governmental units liable in a few instances. See, for example, *Radach v. Gunderson*¹⁶³ in which a Washington court held a city liable for expense of moving an ocean-front house which did not meet zoning setback and which was constructed pursuant to a permit issued by city. The city was aware of violation before construction. The court considered acts of city to be “ministerial.” See also *Hurst v. U.S.*, discussed above, in which the court held the Corps of Engineers liable for failing to enforce a Section 404 permit.¹⁶⁴

LIABILITY FOR MEASURES DESIGNED TO COMPENSATE INDIVIDUALS FOR HAZARD LOSSES

In some instances, individuals damaged by natural hazards have sued governmental units for failing to provide flood insurance payments, disaster assistance, or other disaster-related benefits provided generally by governments to individuals damaged by natural hazards.

¹⁵⁸ 442 N.Y.S.2d 326 (N.Y., 1981)

¹⁵⁹ 663 P.2d 251 (Ariz., 1983) .

¹⁶⁰ 332 N.W.2d 479 (Mich., 1983).

¹⁶¹ 423 So. 2d 911, 913 (Fla., 1983).

¹⁶² See, *Dept. of Env'tl. Protection v. Hardy*, 907 So.2d 655 (Fla., 2005) (Identifying regulated wetlands and enforcing wetland regulations were discretionary functions and not subject to suit.)

¹⁶³ 695 P.2d 128 (Wash., 1985).

¹⁶⁴ See notes 139-142 above.

Flood Insurance

The National Flood Insurance Program provides flood and erosion insurance to over 4.5 million properties throughout the Nation. Some property owners with National Flood Insurance policies and flood or erosion damage have sued the Program if they are not satisfied with the insurance payments or have not been paid. Court decisions have applied the overall rules of contract and insurance law and interpreted the terms of National Flood Insurance contract.¹⁶⁵ Discussion of the many National Flood Insurance Program cases is beyond the scope of this paper.

However, some broader aspects of the program have been challenged in court and are of interest here. For example, in *Texas Landowners Rights Associations v. Harris County*¹⁶⁶ a federal court of appeals upheld the overall constitutionality of the National Flood Insurance Program and held that denial of federally subsidized flood insurance to certain landowners and the community was a denial of “benefits” rather than denial of any “property right”. Because of this, the court further held that landowners and the community could not claim a “taking” if insurance (benefits) or disaster relief (benefits) were denied for failure to comply with National Flood Insurance Program standards.

In *Adolph v. Federal Emergency Management Agency*¹⁶⁷ a U.S. court of appeals upheld parish floodplain regulations adopted in Louisiana to qualify the parish for the National Flood Insurance Program against a claim that the regulations were a taking of private property. The court not only reaffirmed *Texas Landowners*, above, but held that parish regulations adopted to implement the program are not a taking because they do not deprive landowners of all beneficial use of their lands.

In *Commonwealth of Pennsylvania v. National Association of Flood Insurance*¹⁶⁸ a federal district court rejected a billion dollar claim against the Federal Insurance Administration (FIA) by the state of Pennsylvania after tropical storm Agnes caused extensive damage in 1972 and further flooding and mudslides occurred in 1973. Pennsylvania argued that FIA had not adequately publicized the NFIP as required by the NFIP enabling statute and, therefore, many properties in Pennsylvania were uninsured. The court denied the claim and held that FIA had distributed brochures and carried out other public information activities and that the precise nature of such activities was discretionary.

The Federal Emergency Management Agency has sued some private landowners and governments under a “subrogation” theory for causing flood damages which were compensated through National Flood Insurance Program. In *United States v. Parish of St. Bernard*¹⁶⁹ a federal court of appeals held that the U.S. could sue the parish or private

¹⁶⁵ See Annot., “National Flood Insurance Risks and Coverage”, 81 A.L.R. Fed 416 (1987); Neubauer, E., *Digest of Litigation on the National Flood Insurance Program*, Third Edition, Federal Emergency Management Agency, Washington, D.C. (1988).

¹⁶⁶ 453 F. Supp. 1025 (D.D.C., 1978), aff’d 598 F.2d 311 (1979), cert. denied, 444 U.S. 927 (1979).

¹⁶⁷ 854 F.2d 732 (5th Cir., 1988).

¹⁶⁸ 520 F. 2d 11 (3rd Cir., 1975), on remand, 420 F. Supp. 221 (M.D. Pa., 1976).

¹⁶⁹ 756 F.2d 1116 (5th Cir., 1985), cert. denied, 106 474 U.S. 1070 (S.Ct., 1986).

landowners under the concept of subrogation for injuries caused by the parish or landowners resulting in claims paid by the National Flood Insurance Program under certain common law rights of recovery. The court held, however, that FIA (Federal Insurance Administration) could not enjoin parish violations nor could the FIA sue the parish under a theory that a contract existed between the community and FIA to comply with federal regulations.

Disaster Assistance

Federal disaster assistance programs provide several types of assistance to individuals damaged by natural hazards including disaster assistance grants and low interest loans. Individuals failing to receive such assistance have, in some instances, filed law suits in an attempt to gain assistance. Suits have usually failed based upon a “discretionary” action defense.¹⁷⁰

But a small number of courts have concluded funding is mandatory or that particular procedures should be followed.¹⁷¹

CONCLUSIONS

Governments face the greatest risk of liability when they increase flood hazards and flood losses on private lands by filling, grading, ditching or constructing roads, bridges, dams, levees, sea walls, or stormwater systems. This is particularly true when governments fail to adequately maintain and operate flood control and stormwater structures. Courts hold governments liable like private landowners when governments own and manage government property (including flood control structures).

Courts are much less likely to hold governments held liable for the failure of nonstructural flood loss reduction measures such as warning systems, flood maps, emergency planning, and emergency operations because government ownership of land is

¹⁷⁰ See, for example: *Rosas v. Brock*, 826 F.2d 1004 (11th Cir., 1987) (Disaster payments are discretionary.); *U.S. v. Day*, 857 F.2d 1184 (8th Cir., 1988) (SBA did not abuse its discretion in refusing to defer loan obligations.); *Gettler v. Lyng*, 857 F.2d 1195 (8th Cir., 1988) (Special disaster assistance program was discretionary and the rules adopted to implement it were not arbitrary, capricious or an abuse of discretion.); *California-Nevada Meth. Homes v. Fed. Emergency Mangt Agency*, 152 F. Supp.2d 1202 (D.Cal., 2001) (FEMA decisions regarding allocation of earthquake relief funds are not subject to judicial review.) *United Power Association v. Federal Emergency Mangt. Agency*, A2-99-180 (D., N.D., 2000) (Power Company did not a right to disaster assistance for damages due to flooding at Devil’s Lake because this was discretionary. Court held that discretionary exemption to Tort Claim Act did not apply to due process claim.)

¹⁷¹ *Hall v. Lyng*, 828 F.2d 428 (8th Cir., 1987) (Government could be compelled to provide mandatory disaster payments where wheat farmers were prevented from planting as a result of spring floods.); *Graham v. Fed. Emergency Management Agency*, 149 F.3d 997 (9th Cir., 1998) (FEMA does not have unlimited discretion to distribute funds under Individual and Family Grant Program.); *McWaters v. Federal Emergency Management Agency*, 05-5488, Section “K” (3) (D., Louis., 2006) (FEMA not liable for failure to provide disaster assistance but court mandated FEMA compliance with specific procedures.); *Association of Community Org. For Reform Now v. FEMA*, Civil Case No 06cy1521 (RJI) (D.C. 11-29-2006) (Court issued injunctive relief requiring FEMA to provide adequate written notice for any decisions denying long term housing benefits to victims of Katrina.).

not involved and these activities are highly discretionary. Courts are even less likely to hold governments liable for “taking” private property through the adoption of floodplain regulations. However, courts may hold governments liable for issuing building permits or approving subdivisions which increase flood or erosion problems on other properties. This is particularly true if governments accept dedications of inadequately designed roads, storm water facilities and other infrastructure.

Governments face particularly large damage awards from class action suits based upon the failure of state and local levees and dams because, nationally, many levees and dams are substandard and poorly maintained. Catastrophic losses may occur when levees or dams fail. Governments may be either held strictly liable or liable for negligence (unreasonable conduct) when such losses occur. Such losses must be reasonably anticipated.

Given the increasingly probability of successful suits due to scientific and engineering advances in proof of causation and standards for “reasonable” floodplain conduct, governments should anticipate damage awards in floodplain management decision-making. This is particularly true for levees and dams. As a matter of public policy, liability risks should be reflected in calculating benefit/cost ratios.

REDUCING POTENTIAL LIABILITY

How may governmental units reduce potential liability for hazard loss reduction measures? Several recommendations may be made which apply to both structural and nonstructural measures:

- Stay out of flood hazard areas if possible including public buildings and construction of roads, sewer and water supply systems Apply a “no adverse impact” standard if you do need to occupy flood hazard areas as suggested by the Association of State Floodplain Managers.¹⁷²
- Act “reasonably” if you act at all. Be prepared to defend the reasonableness of your conduct.
- Carry out a community flood liability audit and flood loss reduction plan: Map flood areas. Identify locations where public activities have increased flood hazards (e.g. bridges). Develop and implement hazard reduction and loss reduction plans for these and other areas.
- Do not increase flooding on other lands (depth of flooding, amount, velocity, erosion, point of discharge). Apply a no adverse impact standard in locating and constructing public works, and, in regulating private activities.
- Do not attempt to hide behind Act of God or “not knowing” defense. These defenses are increasingly unsuccessful. Acknowledge flood issues, evaluate hazards, and make positive decisions to address hazards.
- Encourage private landowners in flood hazard areas to purchase flood insurance. Landowners rarely sue if they are compensated by insurance.

¹⁷² For a description of “no adverse impact” floodplain management including case study examples, a tool kit, and legal analysis see the Association of State Floodplain Manager’s Web site, www.floods.org.

Additional, more specific suggestions for reducing potential liability with **structural measures** (e.g., dikes, dams, levees, stormwater, groins, jetty's) include:

- Incorporate a wide safety factor in all designs. Apply a no adverse impact standard to ensure that structures do not shift flood impacts to other properties.
- Consider and publicize residual risks for dams, levees, other structures. Reflect residual risks in calculating benefit/cost ratios and in all phases of design and implementation. Reflect residual risk in flood insurance mapping and insurance rates.
- Approach the maintenance and operation of structural measures with particular care.
- Submit location, design frequency, overall design decisions to government policy makers so that costs, other factors are taken into account and these decisions become “discretionary” .
- Utilize “future conditions” for calculating flood flows so that structures are not overtopped by larger flows caused by increased runoff from development.

Additional, more specific suggestions for reducing potential liability for **nonstructural measures** (e.g., flood predictions, warnings, warning signs, evacuation plans, emergency shelters) include:

- Act “reasonably” in light of the evolving state of the art in flood loss reduction including evolving technologies.
- Relate the degree of care exercised to the degree of risk.
- Exceed minimums and the norms in designing, implementing, operating and maintaining measures.
- Subject design decisions to discretionary review by legislative bodies or policy-makers in executive agencies taking into account cost, risks, other factors.
- Be particularly careful with “ministerial” activities such as dissemination of hazard information.

Additional, more specific suggestions for reducing potential liability with **regulations** include:

- Apply performance standard approaches.
- Consider impacts of permitting decisions on adjacent landowners including the cumulative impacts of such decisions. Apply a no adverse impact standard.
- Consider future conditions to calibrate flood levels so that permitted buildings and other structures are not damaged by future flood levels.
- Be fair and even-handed. In evaluating the appropriateness of a proposed activity, consider the impact on other properties as if all similarly situated properties were permitted to cause the same impact.
- Consider the cumulative impacts of development, subdivisions, fill and grading, stormwater systems.

- Be particularly careful where regulations may deny all economic use of entire properties. Suggest positive uses to landowners.
- Relieve the economic burdens or regulations through tax incentives, development right transfers, public acquisition of flood areas as greenways, open space..
- Consider the flood/erosion impacts in accepting dedications of stormwater facilities and other flood control measures, carrying out inspections, and enforcement.