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Minnesota's Flood Plain Management Act—
State Guidance of Land Use Controls

After two years of consideration, the Minnesota Legislature enacted the Flood Plain Management Act in April, 1969. As stated in the statute,

It is the policy of this state and the purpose of [this act] not to prohibit but to guide development of the flood plains of this state, to provide state coordination and assistance to local governmental units, to encourage local governmental units to adopt, enforce and administer sound flood plain management ordinances, and to provide the commissioner of conservation with authority necessary to carry out a flood plain management program for the state and to coordinate federal, state, and local flood plain management activities in this state.

This Note will present the background of the flood plain problem, the legislative history of the Act, a critique of its legal and policy implications, its relation to the national flood insurance program and a comparison of the Minnesota Act with similar statutes of selected other states. Also, the Note will provide the reader, especially Minnesota attorneys and public officials, with an introduction to and bibliography for the legal and political aspects of flood plain management.

I. BACKGROUND

To evaluate the Act one must look first to the problems and events which led to its passage. A federal task force estimated that between 1936 and 1966 federal investment in flood protection and prevention totaled more than $7 billion. Currently, such federal expenditures total $500 million annually and are increasing. Despite this massive investment, annual national losses from flood damage are estimated at more than $1 billion.

While "[f]loods are an act of God, flood damages result from the acts of men." The rationale for flood plain management is

1. Minn. Stat. §§ 104.01-07 (1969). Because of the integral relationship between engineering and law in consideration of this act, a selected glossary is presented at note 51 infra.
3. Many studies and reports have appeared on flood plain management. A bibliography of these is printed periodically by the Tennessee Valley Authority in TVA, Flood Damage Prevention (5th ed. 1967).
5. Id. at 14.
that in many locations losses could be reduced more economi-
cally by limiting what can be put in the path of potential flood
waters than by trying to contain those waters. Flood dam-
gages are a direct result of occupation of flood plain lands (see diagram, infra page 1165, showing a representative flood plain), a rate of
occupation which is increasing under the pressure of urban ex-
pansion. Economists estimate that during the last thirty years
30 percent of the increase in property damage by flood has re-
sulted from increased use of the flood plain for building and
other purposes, and 45 percent has been caused by an increase in
the value of property located on flood plain lands.

In Minnesota more than 100 urban communities have flood
damage problems principally resulting from overflow of the
Mississippi, Minnesota and Red Rivers and 21 of their tribu-
taries. More than $26.5 million has been spent in the state for
flood control projects. Yet in 1965 alone estimated flood damage in Minnesota was $92 million. Of that amount,
$39.7 million represents damage in urban areas.

There are a variety of reasons for flood plain occupation,
ranging from the historical to the unscrupulous. Probably the
most understandable motivation is historical and emotional.
Many cities originally were located near streams for reasons of
transportation, water supply and water power. Years later, per-
sons in such communities do not wish or cannot afford to relocate on higher ground. Need for access to water often remains a
reason for the occupation of flood plain lands. An electric power
plant requiring cooling water, a sewage treatment plant requir-
ing an outfall for its effluent or a barge terminal facility might

6. Id. at 6-12.
7. MINN. CONS. DEPT.: FLOODS AND FLOOD DAMAGE REDUCTION
IN MINN. 3 (1968) [hereinafter cited as MINN. REP.]. Only 25 per-
cent resulted from an increase in flooding.
8. This is opposed to problems either of local drainage or of vary-
ing lake levels.
10. Id. at 18-19, 21, 24. In addition, completed water conservation
protection plans cover eight percent of the state's land area.
11. Id. at 10. Worst hit was the city of Mankato with damages of
$5,093,000. In all, 43 urban communities suffered damages, amounting
to more than $500,000 each for 17 of them.
12. Id. at 11.
13. As an example, 85 percent of the city of North Mankato is in
the flood plain. Hearings Before the Subcomm. on Flood Plain Zoning
of the Senate Comm. on Public Domain, State of Minn. at 26 (March 26,
1968) [hereinafter cited as Hearings].
Diagram of flood plain area as defined in the Minnesota Flood Plain Management Act, sec. 2. Flood plain limits determined by extent of flood with probability of recurrence of once in 100 years, the regional flood. Source: Note, Flood Plain Zoning for Flood Loss Control, 50 Iowa L. Rev. 552 (1965). See glossary of terms used in note 51 infra.

rationally be located on a flood plain, depending on a variety of economic considerations.\(^\text{14}\)

\(^{14}\) This is exemplified by the cost to extend the intake equipment
Another cause of flood plain occupation is ignorance of the flood threat, often supported by accurate information that "it has never flooded here." But a hydrologist might calculate that the same location would be flooded—on the average—once in 100 years, a statistical probability of flooding which is one percent in any given year. With this probability of occurrence, the area in question would be designated a "flood plain area having special flood hazards." Nevertheless, a layman, ignorant of the statistical significance of the threat, might be willing to build on that site. The expert, if asked, could point out that the city of Denver, Colorado, for example, was struck twice within five years by floods with a probability of occurrence of only one percent.

In addition, land that is known to be subject to occasional flooding will often be lower in value than comparable land outside the flood plain. If a careless or unscrupulous developer can obtain financing, a housing development can be built and the homes sold to unsuspecting individuals before a flood strikes.

Just as a false sense of security is often generated by an existing flood protection project, anticipation of a proposed project is still another reason for occupation of the flood plain. Nevertheless, such projects must be studied, authorized and funded before construction begins. The study period alone averages more than ten years. Furthermore, there are a variety of potential roadblocks en route to construction. In some cases a

for the power plant versus a shorter intake and greater flood damage risk; the possibility of flood proofing; the cost to deepen the channel to restore capacity taken by the encroachment, and the distribution of cost bearing—to upstream property owners, taxpayers, the affected industry—or any of the preceding.


16. TASK FORCE, supra note 4, at 27. The task force report only alludes to the problem. In the files of the task force are pictures showing housing developments under water, developments whose financing was guaranteed by federal agencies. Executive Order 11296 was issued to remedy this and other problems associated with previous federal encouragement of flood plain occupancy. Exec. Order No. 11296, 3 C.F.R. § 1(2) (1966). Similarly, one Iowa City, Iowa, subdivider saw his advertising sign "Choice Lots for Sale" submerged when flood releases from the Coralville Reservoir at half the expected maximum rate inundated the area. IOWA ST. U. PRESS, FLOOD PLAIN MANAGEMENT: IOWA'S EXPERIENCE 5 (M. Dougal ed. 1969).

17. TASK FORCE, supra note 4, at 6, 8.

18. Id. at 11.

feasibility study may show that a given project is not economically justified or the voters in a community may fail to pass a bond issue necessary to pay the local share of the project's costs. At any point progress toward the start of construction of the project may be slowed or halted by a change in the political winds.

Often reinforcing all other causes is the pressure for urban expansion. In many cities originally located near streams, the only vacant land near the downtown area is subject to floods. Such land is a prime target for development in anticipation of protection.

In most simple terms, flood plain management regulates occupancy. It is an attempt to keep men away from floods rather than, or in addition to, keeping floods away from men. The concept is no more than 40 years old. Prior to 1949 only four flood plain zoning ordinances had been enacted; the first legal commentary on the subject was not published until 1959; and an intensive review of the literature reveals only nine additional legal articles. Most discussion of the subject has taken place in technical journals, in the non-legal sectors of academia and among federal water resource officials.

20. TASK FORCE, supra note 4, at 6.
21. Delano, Minnesota apparently has this problem. Hearings, supra note 13, at 12 (June 24, 1968); see also Table 1, p. 23 infra.
24. Dunham, supra note 22.
26. The exception was the TVA which pioneered in flood plain management beginning in the early 1950’s under the leadership of James Goddard, a member of the federal task force, supra note 4, and now a consultant on flood plain management.
Until 1966 the primary responses to flood threats were to build structures to prevent stream overflow or to evacuate whatever was portable and suffer damage to what remained. As mentioned above, these losses recently have amounted to $1 billion annually.\(^{27}\) In 1966 the first of two determinative events occurred. In August of that year, President Johnson released the report of the Task Force on Federal Flood Control Policy and strongly supported its basic approach.\(^{28}\) The report made 16 recommendations, all focusing upon nonstructural solutions to the problem of flood damage, including flood plain regulation. Of particular relevance were the recommendations to triple (to $6 million annually) the funding of the Corps of Engineers' flood plain information program which provides local communities with the hydrological information necessary for flood plain management,\(^{29}\) and to have the Water Resources Council encourage the states to "deal with the coordination of flood plain planning and with flood plain regulation."\(^{30}\)

While the task force report stimulated some activity in Minnesota,\(^{31}\) the major impetus for legislative action was probably the passage of the National Flood Insurance Act of 1968.\(^{32}\) Butressed by the recommendations of the federal task force,\(^{33}\) the Administration insisted on requirements for local adoption of flood plain land use controls as its price for supporting a flood

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27. TASK FORCE, supra note 4, at 3.
29. Id. at 22. Appropriations for the program have more than doubled but have not yet reached the recommended level. Interview with Harold Toy, Flood Plain Management Officer, St. Paul Dist., U.S. Army Corps of Engineers, in St. Paul, Feb., 1969.
30. Id. at 26. The Water Resources Council commissioned a study by John Kusler and Douglas Yanggen of the University of Wisconsin, Madison. The study, published in the fall of 1970, covers the legal aspects of flood plain management and includes a lengthy discussion of the constitutionality of flood plain regulations. For another example of the Water Resources Council's efforts see note 77 infra.
31. See text following note 43 infra.
32. Title XIII, Housing and Urban Development Act of 1968, 42 U.S.C. §§ 4001-4127 (Supp. V, 1970) [hereinafter cited as INSURANCE]. The insurance bill was passed by both houses in slightly different forms in 1967, but the differences prevented final passage in that year. Prime forces behind final passage were the winds of Hurricane Betsy which struck New Orleans. The Honorable Hale Boggs (D. La., then House Majority Whip) has since been a staunch advocate of flood insurance. Hearings on National Flood Insurance Act of 1967 Before the Subcomm. on Securities of the Senate Bank. and Curr. Comm., 90th Cong., 1st Sess. 3 (1967); Hearings, supra note 13, at 6 (October 24, 1968).
33. TASK FORCE, supra note 4, at 17, 38.
insurance program. The impact of flood insurance on flood plain management is still uncertain.

II. THE ACT AND ITS LEGISLATIVE HISTORY

The Flood Plain Management Act directs local governmental units (when adequate technical information is available) "[to] adopt, administer, and enforce flood plain management ordinances . . ." and empowers the Commissioner of Natural Resources to coordinate and assist the efforts of local governments.

To insure local action, each county, city, village and borough is required to submit to the Commissioner by June 30, 1970, a letter of intent to comply with the Act. Provisions for the Commissioner to coordinate include authority to: (1) establish, by regulation, criteria for determining permitted flood plain uses, use alternative flood plain management measures and create variance procedures; (2) review and approve local ordinances and amendments to those ordinances; (3) inspect and evaluate enforcement of and compliance with local flood plain management ordinances, and (4) seek enforcement of local ordinances.

Before it became law the Act went through several transformations. The 1967 legislature had two flood plain management bills before it, one suggested by the Minnesota-Wisconsin

34. INSURANCE, supra note 32, § 1315:
   After June 30, 1970, no new flood insurance coverage shall be provided under this title in any area (or subdivision thereof) unless an appropriate public body shall have adopted permanent land use and control measures [with effective enforcement provisions] which the Secretary finds are consistent with the comprehensive criteria for land management and use under section 1361.

35. See text of article following note 109 infra.


37. MINN. STAT. § 104.03(1) (1969).

38. MINN. STAT. § 104.04(2) (1969).

39. MINN. STAT. § 104.05 (1969).

40. MINN. STAT. § 104.04(3) (1969).

41. MINN. STAT. § 104.04 (1969).

42. MINN. STAT. § 104.03 (1) (1969).

43. MINN. STAT. § 104.07 (1969):
   Every structure, fill, deposit, or other flood plain use placed or maintained in the flood plain in violation of a flood plain management ordinance adopted under or in compliance with the provisions of . . . this Act is a public nuisance and the creation thereof may be enjoined and the maintenance thereof abated by an action brought by the commissioner of natural resources or a local governmental unit. A person who violates any of the provisions of . . . this Act is guilty of a misdemeanor. Each day during which such violation exists is a separate offense (emphasis added).
Boundary Area Commission and one supported by the Department of Natural Resources. While no action was taken on either bill, the Senate did appoint an interim subcommittee to study the issue of flood plain regulation.

Both 1967 bills were modeled after a 1966 Wisconsin flood plain zoning statute which requires effective local flood plain zoning by a specified date and, failing local action, allows the State Department of Resource Development to adopt an ordinance on its own initiative or upon petition of another state agency, a municipality, or 12 freeholders. Such residual authority for the state to zone was opposed in the hearings by the interim subcommittee, especially the Association of Minnesota Counties. Influential members of the Senate were also opposed to any specific date for compliance by local governments. In the face of this opposition, the Department of Natural Resources submitted for consideration by the 1969 legislature a draft bill which contained neither residual state power for zoning nor any specific compliance deadline. Before introduction as a bill, more changes were made in the draft, and the Senate amended the bill before passage. The House left the Senate bill intact.

Of particular import were three changes in the draft bill before its introduction as S.F. 1455. First, the bill as introduced omitted the language in the draft which specified that certain land uses would be prohibited within a floodway unless they did not "create a material change in the water level of the regional flood" and which gave the Commissioner power

44. Senate File No. 1617, 65th Sess., Minn. Legislature.
50. The draft is on file with the Dept. of Conservat., Div. of Waters, Soils, and Minerals, File No. OF 282, 988 Jh 61-2 [hereinafter cited as Bill OF 262].
51. Id. § 3(2). The following is a selected glossary of terms used in flood plain management taken from 7 Wis. Ad. Cons RD 16.05: 
   Designated Floodway. The channel of a stream and those portions of the adjoining flood plains designated by a regulatory agency (department of natural resources) to provide for reasonable passage of flood flows.
   Encroachment Lines. The lateral limit or line along each side and generally parallel to the stream or other bodies of water, within which no structure or fill may be added. Their purposes are to preserve the flood carrying capacity of the stream or other body of water and its flood plain, and to assure attainment of the basic objective of improvement plans that may be considered or proposed. Their location, if along a stream, should be such that the floodway between them will effectively
to define "material change." Second, whereas the draft bill allowed the Commissioner to establish the "uses ... which are compatible with the floodway and flood fringe," the law as introduced and passed allows the Commissioner to establish only "criteria for determining the flood plain uses which may be permitted without creating an unreasonable public hazard or unduly restricting the capacity of the flood plain to carry and discharge the regional flood." Third, lobbyists for a private company succeeded in having a new section added to the draft bill which required the Commissioner and local governmental units to "give due consideration to the needs of an industry whose business requires that it be located within a flood plain." These changes, which will be discussed below in more detail, weakened the bill as an instrument for flood plain management.

The Senate added three amendments, two of which further weakened the bill. Most significant was an amendment deleting carry and discharge a flood not less than the regional flood.

**Flood Frequency.** A means of expressing the probability of flood occurrences as determined from a statistical analysis of representative stream flow records. It is customary to estimate the frequency with which specific flood stages or discharges may be equalled or exceeded, rather than the frequency of an exact stage or discharge. Such estimates by strict definition are designated "exceedence frequency," but in practice the term "frequency" is used. The frequency of a particular stage of discharge is usually expressed as occurring once in a specified number of years.

**Flood Plain.** The areas adjoining a watercourse or other body of water which has been or may be hereafter covered by flood water.

**Flood Plain Management.** A term applied to the full range of public policy and action for insuring wise use of the plains. It includes everything from collection and dissemination of flood control information to actual acquisition of flood plain lands, including the enactment and administration of codes, ordinances, and statutes regarding flood plain use.

**Flood Proofing.** A combination of structural provisions, changes, or adjustments to properties and structures subject to flooding primarily for the reduction or elimination of flood damages to properties, water and sanitary facilities, structures, and contents of buildings in a flood hazard area.

**Reach.** A hydraulic engineering term to describe longitudinal segments of a stream or river. A reach will generally include the segment of the flood plain where flood heights are primarily controlled [by] man-made or natural flood plain obstructions or restrictions. In an urban area, the segment of a stream or river between two consecutive bridge crossings would most likely be a reach.

52. **Bill OF 262, supra note 50, § 5.**

53. **Id.** The diagram, p. 3 supra, illustrates the flood plain and its constituent parts.

54. **Minn. Stat. § 104.05 (1969) (emphasis added).**

55. **Minn. Stat. § 104.06 (1969).**
the appropriation of $200,000 for the program. Also, the bill as introduced prohibited alteration of structures existing within the flood plain as of the effective date of an applicable local ordinance. The bill as passed limited the prohibition to "major" alterations and provided a partial and ambiguous definition of that term. Finally, the Senate added the following language which may tend to strengthen flood plain management in Minnesota: "Nothing . . . [in this act] limits the power of a local governmental unit or town to adopt or continue in force a flood plain management ordinance which is more restrictive than that which may be required pursuant to . . . [this act]."

The statute which resulted from the legislative process was a compromise. As indicated by the changes made in the bill, the major issue was the appropriate level of decision for flood plain regulation. Some influential senators, county and municipal officials and private interests were opposed to any form of state control. Conversely, the Natural Resources Department

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56. Compare House File No. 1841, 66th Sess., Minn. Legislature with Senate File No. 1455, § 7, 66th Sess., Minn. Legislature. The Department of Natural Resources had requested 16 additional positions for all the programs of the Division of Waters, Soils and Minerals. Nine of the 16 were intended for the flood plain management and related shorelands protection programs (see note 100 infra). The Legislature allowed three positions for this Division. All three will be allotted to the flood plain management and shorelands programs. Interview with Eugene Gere, Director, Division of Waters, Soils and Minerals, Minnesota Department of Conservation, in St. Paul, Sept. 1969.

57. Minn. Stat. § 104.03(2) (1969). That subdivision as enacted states, [1] in places where the flood plain has been delineated by ordinance . . . no major alteration to a structure in existence on the effective date of the ordinance . . . shall be permitted after the effective date of the ordinance . . . . As used in this subdivision, major alterations of existing structures shall not include repair or maintenance and shall not include repairs, maintenance or alterations to structures made pursuant to the authority of any other authorized agency of the state or federal government and provided further that this subdivision shall not apply to alterations, repair or maintenance reasonably done under emergency circumstances to preserve or protect life or property (emphasis added).

The emphasized language is an amendment added by the Senate.

58. Minn. Stat. § 104.04(3) (1969). Most towns may not have power to zone with respect to flood hazard. See text accompanying note 81 infra.


60. Seven senators, including Senator Rosenmeier, Chairman of the Senate Judiciary Committee, were opposed to the bill. Senator Rosenmeier was one of the principal sponsors of the act enabling the establishment of Regional Development Commissions. See note 63 infra.
and some other municipal officials, especially those responsible for city planning, desired greater state control as the means by which to overcome pressures for unwise development of flood plains.61 Those pressures, it was argued, could either prevent adoption of flood plain regulations or, at a minimum, result in restrictions only as strict as those required by the criteria issued under authority of the flood insurance act.62 Basically, the issue of the level of decision was resolved in favor of local control within state guidelines and, potentially, in favor of an intermediate level between state and local government, the Regional Development Commission.63

III. IMPLICATIONS FOR LAW AND POLICY

A. LEVEL OF CONTROL

The unwillingness of the legislature to provide residual state regulatory power and a specific time limit for adoption of local controls is of primary significance. The Act depends instead for its effectiveness upon persuasion by regional, state and federal water resource experts, the wisdom of local governments and the letter of intent required of them,64 the incentive of flood insurance eligibility65 and language, unfortunately vague, regard-

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A draft of the bill prepared by the office of the Senate Counsel would have made adoption of flood plain regulations by local governments optional and the Commissioner's guidelines advisory only.

61. Hearings, supra note 13, at 25 (March 26, 1968) and 16-19 (June 24, 1968).


63. This was authorized by MINN. STAT. § 462.387 (1969). These Commissions will have powers analogous to those of the Metropolitan Council now serving the seven county area around Minneapolis and St. Paul. MINN. STAT. § 473B.02 (1969). If established, such a Commission has specific power to "coordinate... flood plain management programs..." MINN. STAT. § 462.391(6) (1969). Also, the Commission would have power to review comprehensive plans of counties, municipalities and watershed districts; plans of independent agencies, and applications for federal or state aid whether or not such review is required by the federal government. MINN. STAT. § 462.391(1),(2) & (3) (1969).

64. The letter of intent is not a strong incentive. It will, however, require that somebody in a local government consider the issue of flood plain regulation in a manner sufficient to draft and authorize the sending of the letter. Presumably, the local publicity attendant upon adoption of a resolution to send the required letter will give concerned citizens the opportunity to speak out on the issue.

65. No communities in Minnesota are currently eligible for flood insurance; the Department of Housing and Urban Development requested the Corps of Engineers to conduct a study, necessary for estab-
ing the time of local compliance. Whether, and by whom, "as soon as practicable" is enforceable as any kind of deadline is open to question; the Act is silent on this point. If some means are found to enforce the statutory duty to adopt land use controls, the effect of the law will be enhanced. Hopefully, "as soon as practicable" will not suffer the same fate as the now infamous phrase, "with all deliberate speed."

B. STATE GUIDELINES AND LOCAL CONTROL

The legislature did empower the Commissioner of Natural Resources, within rather general guidelines, to prepare rules and regulations, including criteria for permitted flood plain uses and for "alternative or supplemental flood plain management measures, such as flood-proofing, subdivision regulations, building codes, sanitary regulations, and flood warning systems." It

lishment of insurance premium rates, for Moorhead, Minnesota, to be finished in 1970. Interview with Harold Toy, supra note 29.

66. MINN. STAT. § 104.04(3) (1969):
When the Commissioner determines that sufficient technical information is available for the delineation of flood plains and floodways on a watercourse, he shall notify affected local governmental units that the technical information is available. As soon as practicable after receiving such notice, each local governmental unit shall prepare or amend its flood plain management ordinances in conformance with the provisions of ... [this act], and shall submit the ordinance to the Commissioner for his review and approval before adoption (emphasis added).

67. A writ of mandamus sought by the Commissioner would seem to be a logical means. Perhaps the court would be willing to allow any party affected or potentially affected by local inaction to seek such a writ. If, for example, public facilities such as water or sewer systems were to be scheduled to serve a flood plain area, a local taxpayer might have standing to seek a writ because flood damage to those facilities would cause him direct pecuniary harm and would presumably be a direct result of failure to restrict development as required by the Act. There will be political constraints upon an attempt by the Commissioner to enforce this language.

An unpublished poem catches the spirit of the problem of level of control discussed in this section:

A curious creature is the State;
It must persuade—but may dictate;
It has an intermediate station
Between the County and the Nation,
That is, a sort of middle level
Between the Deep Sea and the Devil.
It is its custom and its wont
To do what other people don't,
Its functions, therefore, though official,
Are always somewhat interstitial.


68. MINN. STAT. § 104.05(a),(c) (1969). As of September, 1970, the Department of Natural Resources has announced proposed regulations and has held a public hearing, but final action has not been taken.
should be emphasized that without the language regarding other measures, the Act would be, in reality, a law to encourage flood plain zoning and not a flood plain management program. Zoning is probably the most critical feature of flood plain regulation. Other measures are necessary, however, for allowing more economically efficient use of flood prone lands.69

As writer of the standards and the criteria, the Commissioner has been given the role of resolving by regulation the political conflicts faced by the legislature. He must formulate the regulations with attention to the fact that the thrust of the amendments was to limit the restrictiveness of the land use policies established by those regulations. Because of the Senate amendments, the regulations will have to define “necessary uses”70 and “major alterations.”71 The partial definition of major alterations supplied by the legislature is ambiguous. The Act gives no indication as to which state or federal agencies are authorized to allow alteration to structures already located in the flood plain prior to the effective date of the applicable local ordinance. Does the Act, for example, envision that the State Department of Highways or the Bureau of Public Roads can authorize alterations to bridges which will have the effect of raising the water level and damaging property upstream? There is also no indication as to what constitutes “emergency circumstances,” and there may be problems of proof as to which “alterations, repairs, or maintenance [were] reasonably done . . . to preserve or protect life or property” in those emergency circumstances. These issues will, presumably, be covered by the Commissioner’s regulations which are, in turn, subject to legal challenge by affected landowners or local governmental units.

As language regarding “material change in the water level” caused by encroachments was deleted before introduction, the Commissioner no longer has specific legislative support for regulations on that subject.72 Instead of authority to prescribe permitted uses, the Commissioner may only establish criteria for

69. For example, a local building code might specify that the first floor of a building be above a certain elevation, or that a building and its appurtenances be constructed in such a way as to withstand flooding, thus avoiding damage to it and to downstream property produced by a floating garage, propane tank, or privy. See also text preceding note 173.


72. See text accompanying note 53 supra.
uses which "may be permitted without creating an unreasonable public hazard or unduly restricting the capacity of the flood plain." The emphasized phrases dilute the effect of the Act and are filled with problems of interpretation. Again, regulations will be prepared to resolve some of those problems, but the terms used are an invitation to litigation by someone who believes, for example, that building his structure on the flood plain will create only a reasonable public hazard. The challenger would also have to prove, however, that the hazard was reasonable and did not unduly restrict the flood plain capacity.

The Commissioner's role in resolving conflicts must also be viewed in light of the legislature's failure to appropriate funds for the flood plain management program. There will probably be pressure upon the Commissioner to promulgate minimally restrictive standards. The legislature's failure to fund may indicate a lack of enthusiasm. Without funds and with limited personnel, the Commissioner will be hard pressed to generate support for effective regulations.

Underlying the entire discussion of state criteria and regulations is the fact that flood plain land use restrictions require substantial technical data for their legal justification. In enacting a flood plain zoning ordinance, special care must be taken to insure that the districts created are based upon sound hydrological information. If such care is not exercised, the ordinance is likely to be vulnerable in court. The Commissioner's criteria, therefore, must also be technically defensible in court. In this regard it should be helpful that a flood with a one percent probability of occurrence is used as the definition of the "regional

73. MINN. STAT. § 104.05 (1969).
74. A comment of the representative of the National Ass'n of Home Builders (quoting Sen. Wallace Bennett, R. Utah) is indicative. "Local government representatives and representatives of the home building industry have a great stake in seeing that the [land use] restrictions are reasonable." Hearings on the Nat'l Flood Insurance Act of 1967 Before the Subcomm. on Housing of the House Bank. & Curr. Comm., 90th Cong., 1st Sess. 155 (1967) (testimony for the Ass'n of Minn. Counties) (emphasis added); see also Hearings Before the Subcomm. on Flood Plain Zoning of the Senate Comm. on Public Domain, State of Minn. [hereinafter cited as Hearings].
75. A logical potential counter-alliance exists among conservationists, open space and recreation advocates and taxpayers who wish to avoid subsidizing the costs of future flood control projects.
76. Local officials will likely be able to call upon state and federal hydrologists for expert testimony in support of ordinances that are challenged in court. Also available for support would be the flood plain information report if one has been produced for that location.
flood” in the Minnesota Act and as the basis for determining “flood plain areas subject to special flood hazard” under the National Flood Insurance Act. Such consistency will aid both the Commissioner and the local governmental unit in adopting regulations and ordinances, and in establishing the absence of arbitrariness in their actions.77

77. The U.S. Water Resources Council has acted to coordinate engineering techniques. See U.S. WATER RESOURCES COUNCIL, A UNIFORM TECHNIQUE FOR DETERMINING FLOOD FLOWS FREQUENCIES (Bull. No. 15 (1967)). See also Comment, State Flood-Plain Zoning, 12 De PAUL L. REV. 246, 249 (1963) and the other legal articles cited in notes 22 and 25 supra. As with other land use controls, there are two major constitutional referents for flood plain regulations; these are the guarantees of due process and equal protection. These guarantees are said to be violated whenever exercise of the police power is unreasonable, arbitrary, confiscatory or discriminatory. Note, Flood Plain Zoning for Flood Loss Control, 50 IOWA L. REV. 552, 567 (1965) (normally as applied to a specific property rather than on its face); D. MANDELMAN, MANAGING OUR URBAN ENVIRONMENT 573 (1966) (quoting Tidewater Oil Co. v. Mayor and Council of Carteret, 44 N.J. 338, 342-3, 209 A.2d 105, 108 (1965) ). If there is a reasonable relationship between the regulation and the engineering data, an ordinance should be defensible against due process attacks on the basis of unreasonableness or arbitrariness. See Comment, State Flood-Plain Zoning, 12 De PAUL L. REV. at 252.

Restrictions on flood hazard areas present a more difficult problem with respect to confiscation or unconstitutional taking. A primary reason for establishment of a flood plain district is the prevention of encroachments which will have off-site effects such as increased flood heights upstream, or downstream damage from flotation. Compare New Rules and Regulations, Administration of the Flood Plain Regulations § 23.05(1)(2h) with 7 Wis. Ad. Code RD16.04(7). If the essential effect of an ordinance is to prohibit all structural uses, and if such prohibition means there is no profitable use of the land regulated, a court might find an unconstitutional taking. Dooley v. Town Plan and Zoning Comm’n of Fairfield, 151 Conn. 304, 197 A.2d 770 (1964); Pearce v. Edina, 263 Minn. 553, 118 N.W.2d 659 (1962). Although the Minnesota Supreme Court has not ruled on flood plain regulations directly, a recent case provides an indication of how that court might react. In Filister v. Minneapolis, 270 Minn. 53, 133 N.W.2d 500 (1965), the court refused to find confiscation in a residential classification for swampy land despite substantial evidence that the cost of necessary piling, filling and other improvements was so great as to foreclose reasonable, economic use for residences. The court stated a stringent test as follows:

[1]t was only incumbent on the plaintiffs to show that the ordinance was confiscatory, but they had a burden of proving . . . that the relief they sought would not result in any substantial detriment to neighboring property improved in reliance on the validity of the ordinance (emphasis added).

Id. at 60, 133 N.W.2d at 505 (1965). The possible application of that test to flood hazard areas is clear—if there would be substantial detrimental effects on neighboring (off-site) property, a proposed flood plain use could be prohibited even though there was no other economic use.

With respect to equal protection there are at least two reported flood plain management cases: Vartelas v. Water Resources Commis-
C. Power to Regulate Flood Plains

Authority for political subdivisions to regulate flood plains has been granted by a series of enabling acts of the Minnesota Legislature. Municipalities and so-called "urban towns" have the power to zone for "flood control" under an act passed in 1965. The county where there is a state or federal forest or a state conservation area has had authority to zone to "secure safety from fire, flood, and other dangers" since 1939. All counties other than Hennepin and Ramsey have had power to establish zoning districts for "surface water drainage and removal" since 1959. Watershed districts may be established to control or to alleviate "damage by flood waters" and to regulate "improvements by riparian landowners of the bed, banks, and shores of lakes, streams, and marshes by permit or otherwise. . ." 

Similar authority for non-urban towns is less clear. Towns within ten miles of a city of the first class have the power to "regulate and restrict . . . the uses of land for trade, industry, residence, recreation, agriculture, forestry, soil conservation or other purposes." Many other towns meeting different criteria also have similar powers. In both cases, however, there is no reference to land use regulations related to flood hazards as there is with the enabling language for municipalities, counties and watershed districts. Such omission leaves room for the argument that the legislature would have granted power to regulate the flood plains to towns specifically if it had so intended. That argument carries greater force because the legislature has specifically enabled other political subdivisions to regulate land use on at least four separate occasions.

Notes:

78. MINN. STAT. § 462.357 (1969). Urban towns are more fully discussed in the text accompanying note 84 infra.
79. MINN. STAT. §§ 396.01, -.03 (1969).
80. MINN. STAT. §§ 396.01, -.03 (1969).
81. MINN. STAT. § 112.36 (1969) (emphasis added); see also text accompanying notes 94 and 98 infra for a discussion of problems of multiple authorities regulating the same flood plain land.
82. MINN. STAT. § 366.56 (1969). Minnesota cities of the first class—those over 100,000 population in 1960—were Minneapolis, St. Paul and Duluth.
83. MINN. STAT. § 366.10 et seq. (1969).
84. See notes 78–81 supra and accompanying text. It may be argued that the power to regulate land use to secure "safety from fire and other dangers. . .", MINN. STAT. § 366.14 (1969) is broad enough to allow flood plain zoning. Certainly floods are dangerous. The specific reference to "flood" in various statutes makes the question as to
Assuming towns did not have power to regulate flood plain lands prior to 1969, the section of the Flood Plain Management Act which states that the Act does not limit the power of local governmental units or towns to adopt more restrictive ordinances than required pursuant to the Act is of uncertain effect. It could be argued that this language enables—or recognizes the power of—towns to zone the flood plain. It would be inappropriate, however, to ascribe such an intent to the legislature. There is no reference to enabling in the statement of purpose of the Act. Section 4(3) is the only reference to the towns in the Act. Section 4(1) refers specifically to “applicable laws authorizing local governmental units to adopt flood plain management ordinances.”

A better reading is that the reference to towns in section four applies specifically to so-called “urban towns” which do have the power to zone for flood control. Urban towns are excluded from the definition of “local governmental unit” in the Act. Thus, if the legislature wished to insure that urban towns be able to zone more restrictively, as many local governmental units are able to do, it would have to mention them separately in the Act.

Because urban towns are excluded from the definition of what governmental units can zone at least an open one, however, and the issue has not been considered by the Minnesota Supreme Court. As stated by one author, “as comprehensive zoning developed new and unlisted objectives, the particularity of the statement of purpose became an obstacle, rather than an aid to court approval and it became necessary to expand the list.” 1 R. Anderson, American Law of Zoning § 7.02, at 450 (1968). See also id. § 8.39, where in a discussion of flood plain zoning it is stated, “authority to control land use to prevent flood damage was delegated, if at all, by inference [in the Standard State Zoning Enabling Act (1926)].”

85. The language is quoted in note 57 supra.
87. Minn. Stat. §§ 462.352(2) & 357(1) (1969). An urban town is either (1) a town with a platted area within 20 miles of the city hall of either Minneapolis or St. Paul, or (2) any town having platted areas wherein reside 1200 or more persons. Minn. Stat. § 368.01 (1969). Apparently the latter definition has no practical relevance in the metropolitan area at this time. Of numerous county officials interviewed by telephone, none was aware of the population residing within platted areas in his county.

It is possible to argue that the legislature felt that the language of the enabling act was sufficiently broad, as discussed in note 84 supra, to allow all local governmental units that had zoning powers to zone the flood plain. It is more likely, however, that the legislature did not consider the question or chose not to resolve it.

Table 1. Known Urban Towns\(^a\) in the Metropolitan Planning

<table>
<thead>
<tr>
<th>Area Population and Watercourses</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>County(^b) Township</td>
<td>1960</td>
<td>1969</td>
<td>1985</td>
<td>Projected 1969-85</td>
</tr>
<tr>
<td></td>
<td>(Census)</td>
<td>(Estimate)</td>
<td>(Projected)</td>
<td>Number Increase</td>
</tr>
<tr>
<td>Anoka</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grow</td>
<td>85,916</td>
<td>147,753</td>
<td>233,000</td>
<td>85,247</td>
</tr>
<tr>
<td>Ham Lake</td>
<td>1,402</td>
<td>3,239</td>
<td>6,545</td>
<td>3,306</td>
</tr>
<tr>
<td>Ramsey</td>
<td>1,423</td>
<td>2,861</td>
<td>5,613</td>
<td>2,752</td>
</tr>
<tr>
<td>Dakota</td>
<td>1,179</td>
<td>2,159</td>
<td>5,888</td>
<td>3,729</td>
</tr>
<tr>
<td>Eagan</td>
<td>78,303</td>
<td>132,438</td>
<td>281,684</td>
<td>119,248</td>
</tr>
<tr>
<td>Marshall</td>
<td>3,382</td>
<td>9,383</td>
<td>31,321</td>
<td>19,936</td>
</tr>
<tr>
<td>Nininger</td>
<td>692</td>
<td>872</td>
<td>1,369</td>
<td>497</td>
</tr>
<tr>
<td>Rosemount</td>
<td>332</td>
<td>466</td>
<td>1,814</td>
<td>1,482</td>
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<tr>
<td>Hennepin</td>
<td>944</td>
<td>2,354</td>
<td>2,445</td>
<td>91</td>
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<tr>
<td>Champlin</td>
<td>842,854</td>
<td>978,325</td>
<td>1,315,830</td>
<td>339,565</td>
</tr>
<tr>
<td>Dayton</td>
<td>822</td>
<td>1,809</td>
<td>5,145</td>
<td>3,326</td>
</tr>
<tr>
<td>Ramsey</td>
<td>804</td>
<td>2,188</td>
<td>5,271</td>
<td>3,167</td>
</tr>
<tr>
<td>White Bear</td>
<td>422,525</td>
<td>480,650</td>
<td>640,262</td>
<td>159,612</td>
</tr>
<tr>
<td>Scott</td>
<td>6,175</td>
<td>7,258</td>
<td>20,370</td>
<td>13,112</td>
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<td>Credit River</td>
<td>21,909</td>
<td>30,887</td>
<td>51,593</td>
<td>20,706</td>
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<tr>
<td>Eagle Creek</td>
<td>439</td>
<td>936</td>
<td>1,725</td>
<td>789</td>
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<tr>
<td>Jackson</td>
<td>974</td>
<td>1,948</td>
<td>7,390</td>
<td>5,442</td>
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<td>Spring Lake</td>
<td>506</td>
<td>1,300</td>
<td>3,638</td>
<td>2,338</td>
</tr>
<tr>
<td>Washington</td>
<td>1,464</td>
<td>2,532</td>
<td>3,792</td>
<td>1,260</td>
</tr>
</tbody>
</table>

\(^a\) Source: Minnesota Law Review [Vol. 55:1163]
<table>
<thead>
<tr>
<th>Grant</th>
<th>Tribs. to</th>
<th>Brown's Cr.</th>
<th>1,034</th>
<th>1,965</th>
<th>5,614</th>
<th>3,849</th>
<th>196</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grey Cloud</td>
<td>Miss.</td>
<td></td>
<td>298</td>
<td>331</td>
<td>462</td>
<td>131</td>
<td>39</td>
</tr>
<tr>
<td>Lincoln</td>
<td>Cty. ditches</td>
<td></td>
<td>1,286</td>
<td>1,382</td>
<td>3,066</td>
<td>2,584</td>
<td>187</td>
</tr>
<tr>
<td>May</td>
<td>St. Croix</td>
<td></td>
<td>755</td>
<td>1,254</td>
<td>3,028</td>
<td>1,774</td>
<td>142</td>
</tr>
<tr>
<td>Oneka</td>
<td>Hardwood Cr.</td>
<td></td>
<td>898</td>
<td>1,653</td>
<td>4,577</td>
<td>2,924</td>
<td>177</td>
</tr>
<tr>
<td>Stillwater</td>
<td>St. Croix</td>
<td></td>
<td>822</td>
<td>1,193</td>
<td>4,050</td>
<td>3,757</td>
<td>315</td>
</tr>
<tr>
<td>West Lakeland</td>
<td>St. Croix</td>
<td></td>
<td>433</td>
<td>660</td>
<td>3,504</td>
<td>2,844</td>
<td>431</td>
</tr>
</tbody>
</table>

**METROPOLITAN PLANNING AREA**

| Totals | 1,525,297 | 1,878,433 | 2,776,890 | 900,457 | 48 |


B. There are no urban towns, in accord with above definition, in Carver County.

C. Metropolitan Council DATA-log, No. 4, September 10, 1969.

local governmental units in the Act, they are not subject to the requirements of the Act. Urban towns do not acquire a given municipal power unless such power is specifically granted by the legislature. Logically, the converse is also true. Urban towns acquire none of the duties of a municipality unless specifically assigned to them. If so, then such towns need neither adopt flood plain management ordinances nor submit a letter of intent to do so. Similarly, urban towns need not submit their flood plain management ordinances for review and approval by the Commissioner.

Flood plain lands within an urban town will be subject to the possibility of at least two sets of controls. Counties have power to zone within an urban town, and county controls, where more restrictive, take precedence. Prior to 1963 urban towns were not subject to county zoning powers, but in that year the exception for such towns was removed by amendment. Duality of control contains the potential for conflict between town and county as to whether a given urban town zoning ordinance is in conflict with a county ordnance.

Conflict over consistency with county regulations will have particular significance within the seven county metropolitan area around Minneapolis and St. Paul. Table 1 lists the urban towns within the metropolitan area.

90. An alternative argument is that the policy grounds for restriction on the power of local government to zone point toward the opposite conclusion. The reason for requiring specific delegation is a distrust of government. Because the Flood Plain Management Act reduces the power of a local government by giving authority to the state government, it would be consistent to liberally impose the duty to submit to state control of local actions. However, the state's role as defined by the Flood Plain Management Act neither increases nor decreases the total governmental authority exercised; the Act simply redistributes the power. Thus, a reasonable construction of the statute supports the argument of the text. Given the uncertainty resulting from possible alternative interpretation, it would be appropriate and desirable to amend the Act to settle the question. See text accompanying note 94 infra.

The governing body of any town may continue to exercise the authority to plan and zone as provided by law, but after the adoption of official controls for a county or portion thereof by the board of county commissioners no town shall enact official controls inconsistent with the standards prescribed in the official control adopted by the board. Nothing in this section shall limit any town's power to zone more restrictively than provided in the controls adopted by the county.

As the Table indicates, pressure for urban development is great. The population is expected to increase by nearly 50 percent in the next 15 years. It can be expected that the same area will be subject to the most intense pressures for development of flood plain lands within the state. All 25 urban towns listed have lands adjacent to one or more watercourses, and those towns will, according to projections, have increases in population ranging up to 431 percent in the next 15 years. Because urban towns are not subject to the requirements of the Act, conflict between county and urban town regulations may have to be resolved after the fact. Such conflict becomes significant in light of the competition for industrial development, and thus, for a larger tax base among localities in the metropolitan area. Current litigation involving the Lower Minnesota River Watershed District may be indicative of the problems associated with dual regulatory control. To minimize such conflict, it would be best to amend the Act to require urban towns, like other local governmental units, to submit any proposed ordinances to the Commissioner for review.

There is one potential source of support for flood plain management in the Twin Cities area which must be mentioned in relation to urban towns. The Metropolitan Council has authority (1) to comment upon and recommend changes in the "long term comprehensive plans [of local governments] or any other matter which has a substantial effect on metropolitan area development, including . . . plans for land use"; (2) to review and approve the actions of independent commissions, boards, and agencies which have a multi-community effect, and (3) to review applications for federal aid submitted by all governmental units in the metropolitan area, including federally-aided water resource projects, for consistency with the development guide prepared by the Council. The staff of the Council has indicated strong support for flood plain management. The combined encouragement and leverage of the Metropolitan Council could result in flood plain regulation by urban towns at least to the ex-

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93. These range from county ditch systems to the Mississippi River.
95. MINN. STAT. § 473B.06 (1969).
96. Id., subd. (8).
97. Hearings, supra note 74, at 26 (June 24, 1968).
tent that lack of such regulation would have a multi-community effect or a substantial effect on metropolitan area development.88

D. INTERACTION WITH OTHER WATER RESOURCE LAWS

Already mentioned is the potential impact of the yet to be established Regional Development Commissions.89 The 1969 legislature also passed a shorelands’ protection act which requires counties to adopt controls for the development of the shorelands of lakes and streams in unincorporated areas.90 Although the primary focus of that act is prevention of water pollution and overcrowded, unaesthetic development of lakeshores, it includes within the definition of shoreland “land within 300 feet of a river or stream or the landward side of [a] flood plain delineated by ordinance . . . whichever is greater. . . .”91 The Commissioner of Natural Resources is required by that act to develop model standards and criteria including “(b) the placement of structures in relation to shorelines and roads; (c) the placement and construction of sanitary and waste facilities; (d) the designation of types of land uses; . . . (h) a model ordinance.”92 In contrast to the Flood Plain Management Act, this act authorizes the Commissioner to adapt the model ordinance to a county’s peculiar conditions and to assess the county for the costs of doing so if the county fails to act by July 1, 1972.93

The effect of the Shorelands Act will be to aid flood plain management by forcing development away from the shoreline (and thus away from flood waters) in various ways. For example, the regulations concerning building setbacks and alteration of shorelands will tend to prevent development close to stream channels. Restrictions on the location of sanitary facilities for a structure will have a similar effect. If the flood plain is very

88. Regulation of land use within the Lower Minnesota River Watershed District could, therefore, involve five different governmental units—county, town, Watershed District, Metropolitan Council and the Department of Natural Resources.
89. See note 63 supra and accompanying text.
90. MINN. STAT. §§ 105.485, 394.25, 396.03 & 396.051 (1969).
91. MINN. STAT. § 105.485(2) (1969). The language of the act is not clear as to whether the controls extend 300 feet landward of the flood plain or only to the landward side of the flood plain. Wisconsin has interpreted similar language to mean only to the landward side, not 300 feet beyond. T. LEE & T. FRANGOS, WISCONSIN'S FLOOD PLAIN AND SHORELAND MANAGEMENT PROGRAM 263, 266 (Proceedings, 4th Am. Water Resources Conf., Nov. 18–22, 1968).
level, much development within 300 feet of a stream channel may be prohibited unless the development is connected with a sewer system. Topography will clearly be the determining factor. If the slope of the land leading away from a stream channel is very steep, the flood plain may be much narrower than 300 feet. Conversely, if the flood plain is very flat, it can extend for miles.104

The State Water Resources Board should also be mentioned as having potential importance in flood plain management. The Board was created, in part, to mediate and decide disputes regarding “questions of water policy.”105 This role of the Board is passive, however, and has been exercised only four times since 1955.106 Conceivably, in a dispute between a local government and/or watershed district and the Natural Resources Department over interpretation or application of the Flood Plain Management Act, either party, or an interested third party could petition the Board for referral of the disputed proceeding. Whether the Water Resources Board would be willing or would be asked to adopt the role of referee for flood plain management remains to be seen.107

Prior to passage of the Act, Minnesota had made some progress in flood plain management. As of July, 1968, Minnesota had ten municipalities and four counties whose zoning ordinances included flood plain districts.108 The City of Mankato was preparing a flood plain ordinance during 1969. The Corps of Engineers’ Flood Plain Information (FPI) reports, which can form the technical basis for flood plain regulations, have been completed for Rockford, Delano, Rochester and Austin; and in 1969 similar FPI studies were underway for Fridley, Granite Falls and New Brighton.109

104. The Red River of the North, during flood stages, covers an area as wide as 10-12 miles. Hearings, supra note 74, at 11 (Jan. 12, 1968).
106. Telephone interview with Erling Weiberg, Administrative Secretary, Minnesota Water Resources Board, in St. Paul, April 21, 1970. The Board was established in 1955; the last referral was made in 1963.
107. Of particular import would be a drainage plan of a watershed district having the effect of increasing downstream flows, thus affecting previously established flood plain ordinances. Minn. Stat. §§ 105.71, .73 & .74 (1969).
108. The ten municipalities are Brainerd, Cannon Falls, Chaska, Crookston, East Grand Forks, Hutchinson, Mendota Heights, Red Wing, Rochester and Shakopee. The four counties are LeSueur, Lyon, Rice and Wright. Interview with Eugene Gere, supra note 56.
IV. FLOOD INSURANCE AND FLOOD PLAIN REGULATION

A. The National Flood Insurance Act

The National Flood Insurance Act provides a program of federally subsidized insurance for flood damages suffered by present occupants of flood plains, and insurance for new occupants at full actuarial rates. A related purpose is to encourage wise use of flood plains. Initially, only one-to-four-family residences and their contents are eligible for coverage. Studies were underway in 1969 to allow inclusion of small business properties, and the program is expected to be extended to other kinds of property at an indeterminate future date.

One of the conditions for eligibility for flood insurance is that a local community or state desirous of insurance for its residents evidence "a positive interest in securing . . . coverage" and furnish assurances of intent to comply with land management and use requirements developed under the insurance act. Regulations have been published outlining the criteria used to evaluate the required interest and assurances.

110. Title XIII, Housing and Urban Development Act of 1968, 42 U.S.C. §§ 4001-4127 (Supp. V, 1970) [hereinafter cited as INSURANCE]; regulations issued pursuant to the NATIONAL FLOOD INSURANCE PROGRAM, 24 C.F.R. §§ 1909.1-1915.3 (1970) [hereinafter cited as REGS]. The subsidized (chargeable) rate is $.40 per year per $100 coverage of structure and $.50 per year per $100 on contents. Id. at § 1911.53(a)(1).


112. INSURANCE, supra note 110, at § 1302(c), (e).

113. REGS, supra note 110, at § 1911.3(a).


115. INSURANCE, supra note 110, at §§ 1305(c) & 1361. The insurance act originally established June 30, 1970 as the deadline for evincing interest and furnishing assurances. This was changed to December 31, 1971 by the Housing and Urban Development Act of 1968, P.L. No. 91-152, § 410. Another amendment authorized "emergency flood insurance" for existing dwellings without the necessity of determination of actuarially sound premiums. Id. at § 408.

116. REGS, supra note 110, at § 1910.56:

(a) All appropriate statutes, ordinances, regulations, and similar measures .. should provide land use restrictions
The insurance act makes state participation in the program almost entirely optional. The minimum requirement is that the legislature of a state have authorized some governmental unit(s) to regulate flood plain land use.\textsuperscript{117} If certain state coordination activities are undertaken,\textsuperscript{118} the Federal

based on probable exposure to flooding. Such measures must be applicable at a minimum to the identified area having special flood hazards. [Based on a flood with a 1 percent probability in any given year].

\textbullet \textbullet \textbullet

c) The measures specified in paragraph (a) of this section should:

\begin{enumerate}
\item Prohibit inappropriate new construction or substantial improvements in the floodway;
\item Control land uses and elevations of all new construction within the flood plain outside of the floodway;
\item For coastal flood plain areas (i) prescribe land uses and minimum elevations of the first floors of buildings and (ii) include consideration of the need for bulkheads, seawalls, and pilings;
\item Be based on competent evaluation of the flood hazard as revealed by current authoritative flood plain information; and
\item Be consistent with (i) existing flood plain management programs affecting the areas adjacent to the jurisdiction involved and (ii) applicable State standards. Such measures should take into account the relation between first flood elevations and the anticipated level of the 100-year flood for the purpose of protecting structures and their contents from the damage which would result from such a flood.
\end{enumerate}

See also id. at §§ 1910.57–58, for the criteria for subdivision regulations and building and health codes.

\textsuperscript{117} Rees, supra note 110, at §§ 1910.2(b) (1) & .3(a) (1).

\textsuperscript{118} Rees, supra note 110, at § 1910.54(a):

\begin{enumerate}
\item State participation . . . may include:
\item Enacting where necessary, enabling legislation which confers upon counties and municipalities the authority to regulate flood plain land use in inland and coastal areas;
\item Designating an agency of the State government to be responsible for coordinating Federal, State, and local aspects of flood plain management activities in that State;
\item Delineating the floodways for rivers and streams, and the special flood hazard areas of coastal regions;
\item Establishing minimum flood plain regulation standards consistent with those established in this part;
\item Guiding and assisting municipal and county public bodies and agencies in developing flood plain management plans and land use control measures;
\item Recommending priorities for rate making studies among those communities of the State which qualify for such studies;
\item Communicating flood plain information to local communities and to the general public;
\item Participating in flood warning and emergency preparedness programs;
\item Assisting communities in programs to provide information on minimum elevations for structures permitted to be constructed in flood plain areas having special flood hazards; and
\item Advising appropriate public and private agencies
Insurance Administrator will give “special consideration to State priority recommendations before selecting areas or communities for [insurance] rate making studies,” and “seek State approval of local flood plain land use and control measures before accepting such measures as meeting the criteria...”

Minnesota's Flood Plain Management Act authorizes nine of the ten suggested coordination activities. Enabling legislation had previously been enacted to allow local governmental units to regulate flood plain land use. The Act authorizes the Commissioner of Natural Resources to coordinate federal, state and local flood plain management activities in Minnesota. The Commissioner is also authorized to establish minimum flood plain regulation standards consistent with those established by the insurance act regulations; he has authority to guide and assist local governmental units in developing flood plain management plans and land use control measures; and he may communicate flood plain information to local communities and to the general public. Authority to engage in four other suggested coordination activities is provided by section 3(1)(d) of the Minnesota Act.

The Minnesota Legislature did not authorize the Commissioner to delineate the floodways for rivers and streams. Instead that power was left to local governmental units by ordinance. The Commissioner may establish the technical procedures by which a floodway is delineated and may review this aspect of a local ordinance. Omission of this power of delineation from the Act is not critical, however; the ten activities are only suggested, and the state program need only "substantially encompass" them.

whose activities or projects might obstruct the flow of rivers on the avoidance of unnecessary aggravation of flood hazards.

119. Id. at § 1910.54(b).
120. See note 118 supra.
121. See notes 75-78 & 83 supra.
122. MINN. STAT. §§ 104.01(3) & .03(1)(b) (1969).
123. MINN. STAT. § 104.04(1), (3) & (4) (1969).
124. REGS, supra note 110, at § 1910.
125. MINN. STAT. §§ 104.03(1) & .04 (1969).
126. MINN. STAT. § 104.03(1)(a) (1969).
127. REGS, supra note 110, at § 1910.54(a).
129. MINN. STAT. §§ 104.04 & .05 (1969).
130. MINN. STAT. § 104.04(3) (1969).
131. REGS, supra note 110, at § 1910.54(a).
132. Id. at § 1910.54(b).
B. LIMITATIONS OF FLOOD INSURANCE AS A FLOOD PLAIN MANAGEMENT TOOL

In theory, an insurance program with sound actuarial premiums would tend to discourage uneconomic development in flood-prone areas, but flood insurance may instead actually encourage such development. Two considerations require emphasis. First, although "substantial improvements" to an existing structure are excluded from the subsidy, "substantial" is defined by regulation as "any improvement which increases the actual cash value of a structure by an amount in excess of 50% of its cash value before making of the improvement."\(^{133}\) Obviously, under the definition, insurance for extensive improvements may be subsidized. Moreover, should a substantial improvement be made, the original portion of the structure retains its eligibility for insurance subsidy.\(^{134}\) The regulations also do not explicitly exclude from the subsidy several improvements of 49 percent each. In sum, the subsidies provided in the flood insurance program may not be as temporary as was envisaged\(^{135}\) and may not cause the expected decrease in flood plain occupation.

The other potential effect of flood insurance is increased pressure for federally constructed and subsidized flood control projects which would lower the flood risk and the related insurance premium paid by flood plain occupants. Current federal

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\(^{133}\) Id. at § 1909.1.

\(^{134}\) Id. at § 1911.52(a).


We were however caught on the horns of a dilemma. On the one hand, we did not want to make our criteria so restrictive as to create difficulties for States and localities or so precise as to go beyond the present state of the art. On the other hand, the States and localities have a right to know what is expected of them . . . . Our criteria therefore represent a compromise between these two considerations.

Levin, supra note 114, at 9 (emphasis added).

\(^{136}\) "The great danger to any subsidy arrangement is that it may open the door to setting premiums without relation to exposure. . . . One stroke of the actuarial pen could vitiate hundreds of engineering measures." White, A Flood Loss Reduction Program, Civ. Engineer- ing ASCE 60 (Aug., 1968). Although somewhat restricted by administrative action, the recent amendment to the insurance act appears to be a movement toward such vitiation. But cf. W. Sutton, supra note 111, at 8. Two other relevant papers presented at the ASCE Meeting were #1116, V. Alexander, Effective Use of Non Structural Alternatives in Water Management and #1075, E. Buie, Planning Water Control for Urbanizing Watersheds.
flood control policy requires a local contribution of 50 percent for projects which produce primarily localized benefits. Normally, however, the local share is paid by the taxpayers at large, rather than by the persons whose property is benefited, and whose insurance premiums are reduced by protection. Thus, the landowner on the high ground subsidizes his neighbor in the flood plain. If a flood control project is built at full federal expense, (as are most large federal flood control reservoirs), the subsidy for unwise flood plain development is shifted from local to national taxpayers.\footnote{In fact we think one result of this legislation [insurance] ought to be through the Department of Housing and Urban Development's leadership, to spur Federal, State, and local protection efforts. This would serve both to lower the costs of flood insurance and to enhance land use opportunities for cities and metropolitan areas, like New Orleans, in which buildable land is in scarce supply. . . . Testimony of Ellie Schill, NAHB, \textit{Hearings on The Nat'l Flood Insurance Act of 1967 Before the Subcomm. on Housing of the House Bank. & Curr. Comm.,} 90th Cong., 1st Sess. 155 (1967).}

Flood insurance is also inherently limited in what it can do to reduce flood damage. It will not remedy floodway encroachment which causes increased flood heights and damage on other lands. Flood insurance for structures in low hazard areas will not prevent damage which some uses can cause by flotation of structures onto other lands, will not reduce costs to public facilities which must be extended to these areas and will not prevent the social disruption caused by flooding.

The preceding discussion indicates the need for land use controls, particularly provisions for elimination of nonconforming uses, in association with flood insurance. The criteria for local land use controls established under the flood insurance act\footnote{Regs, supra note 110, at §§ 1910.56-.58. See note 116 supra for partial text of the criteria.} are so general, however, as to depend for their effectiveness upon hydrologically sound state standards and review.\footnote{Id. at §§ 1910.54(b)(2) & .56(c)(5). See text accompanying notes 116 & 118 supra for the language of these sections. In 1970 Minnesota was preparing its regulations for release in that year. Interview with Eugene Gere, Director, Division of Waters, Soils, and Minerals, Minnesota Department of Natural Resources, in St. Paul, Feb., 1970.}

The flood insurance act does contemplate that the Federal Insurance Administrator will identify all flood plain areas having special flood hazards within a five year period ending August 1, 1973.\footnote{Regs, supra note 110, at § 1915.1.} After identification and notification in the Federal
Register, flood insurance will not be made available at subsidized rates within that area for any property which is thereafter constructed or substantially improved. Assuming sufficient funds are provided to meet the 1973 schedule, this provision should have the greatest effect of all the flood insurance regulations which discourage unwise flood plain development.

V. ALTERNATIVE APPROACHES TO FLOOD PLAIN MANAGEMENT

States have resolved the question of the level of decision in flood plain regulation in several ways. Minnesota's compromise solution has already been discussed. Table 2 summarizes and compares the provisions of the Minnesota statute and those of five other states.

A. MINNESOTA

The Minnesota Legislature directed local governmental units to regulate their respective flood plains, but the effectiveness of that legislative order depends primarily on the incentive of flood insurance eligibility. The state establishes the technical standards and has the power to review and approve if a local government adopts regulations as it is directed. The Minnesota Act also establishes state penalties for violations of ordinances promulgated pursuant to the Act.

B. TEXAS

At one end of the spectrum, Texas has opted for complete local control with only minimal state involvement. Of ten state coordinating activities suggested by the flood insurance regulations, the Texas statute mentions only five specifically although the language of the Texas act might be con-

141. See text accompanying note 61 supra.
142. See Table 2, p. 1195 infra.
144. See text of regulations in note 118 supra.
145. The five are REGS, supra note 110, at §§ 1910.54(a) (1), (2), (5), (7) & (9).
   (a) The Texas Water Development Board shall aid, advise and coordinate the efforts of present and future political subdivisions endeavoring to qualify for participation in the National Flood Insurance Program.
   (c) The aforementioned aid may include but is not necessarily limited to:
structured to include three others. Conspicuously absent are references to delineation of floodways and establishment of minimum flood plain regulation standards by the state. Throughout the Texas statute is the clear implication that the state program exists only to serve local communities as they attempt to meet the minimum criteria established by the Federal Insurance Administration for flood insurance eligibility. Given the limitations of flood insurance already described, it is questionable whether the Texas program will result in wise use of flood plain lands. In fairness, the statute does provide a better framework for flood plain management than existed previously. Prior to 1969, local communities had no specific authority to regulate land use with respect to flood hazard and none had done so.

C. CALIFORNIA

California has adopted a slightly different approach. A 1969 statute authorizes state cooperation under the flood insurance

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1. Coordinating local, state and federal programs relating to floods, flood losses, and flood plain management;
2. Evaluating the present structure of all federal, state, and political subdivision flood control programs, within or adjacent to the state, including an assessment of the extent to which public and private flood plain management activities have been instituted;
3. Carrying out studies with respect to the adequacy of present public and private measures, laws, regulations, and ordinances in flood-prone areas as to land management and use, flood control, flood zoning, and flood damage prevention;
4. Evaluating all available engineering, hydrologic and geologic data relevant to flood-prone areas and flood control in those areas; and
5. Carrying out flood plain studies and mapping programs of flood plains, flood-prone areas and flood-risk zones.

(d) On the basis of such studies and evaluations, the Board, to the extent of its capabilities, shall periodically identify and publish information and maps with respect to all flood plain areas including the state's coastal area, which have flood hazards, and where possible, aid the Federal Government in identifying and establishing flood-risk zones in all such areas.


146. REES, supra note 110, at §§ 1910.54(a)(6), (8) & (10). See text accompanying note 118 supra.
147. Id. at §§ 1910.54(3) & (4).
149. See text at Part IV supra.
program in very broad language. Power to regulate flood plain land use is left entirely to local government. Under earlier legislation, flood plain regulation was encouraged primarily with reference to flood protection measures. The only state incentive for adoption of such regulations is denial of state aid for flood control projects that require local contributions of necessary lands, easements, and rights-of-way for communities that do not adopt regulations after completion of a federal project survey report. Except for prospective flood insurance eligibility, there is no incentive for flood plain regulations away from areas where federal project reports have been completed. Like Texas, the California statute appears to envision a program which depends almost entirely upon local action and informal state encouragement for its effectiveness.

D. CONNECTICUT

A third approach has been taken by Connecticut. One of the earlier states involved in flood plain regulation, Connecticut authorized the State Water Resources Commission to establish encroachment lines. Towns, cities and boroughs may adopt such lines prior to state action, but the state may alter locally established lines. Municipalities may otherwise regulate flood plain land use for "safety from flood." In contrast to

For the purpose of providing state cooperation under a national flood insurance program, the department may:
(a) Cooperate with the United States in carrying out studies and investigations with respect to the adequacy of local measures in flood-prone areas as to land management and use, flood control, flood zoning, and flood damage prevention.
(b) Review and comment upon applications of local public agencies to the United States for making flood insurance available in specific areas.
(c) Provide assistance to local public agencies by furnishing information on flood plains and in developing flood plain management plans.

152. CAL. WATER CODE § 8401(d) (West Supp. 1970). "It is the policy of this state to encourage local levels of government to plan land use regulations to accomplish flood plain management and to provide state assistance and guidance therefor as appropriate."


156. CONN. GEN. STAT. ANN. § 25-4(a)-(g) (Supp. 1969).


158. CONN. GEN. STAT. ANN. § 25-4(g) (Supp. 1969).

Minnesota, Texas and California, the state regulates the flood plain directly. This regulation is limited, however, to areas considered for flood protection measures, a serious limitation similar to that in the California statute. Also, there is no specific legislative authorization for coordination of local efforts to qualify for flood insurance. Connecticut’s statute is unique in that it specifically requires consideration of the effects of other cumulative encroachments in a given reach of the stream in relation to issuance of a particular permit.

E. WISCONSIN

A very brief 1965 Wisconsin statute uses the possibility of state zoning of flood plains to encourage the adoption of local regulatory ordinances. The statute is limited to zoning, and the Wisconsin Legislature has enacted no new law specifically related to flood insurance. The State Department of Resource Development has, however, issued detailed regulations which require local zoning ordinances to be supplemented by subdivision and sanitary regulations and building codes. State officials were also significantly involved in the drafting of the flood insurance regulations regarding land use control measures, and the Wisconsin regulations leave no doubt that the state coordinating role is more than sufficient to cover the state activities suggested by the Federal Insurance Administration. The Wisconsin approach clearly uses the strongest formal state encouragement for local governments to adopt flood plain regulations.

161. CONN. GEN. STAT. ANN. § 25-4(a) (Supp. 1969): [The] commission shall issue or deny permits upon applications for establishing such encroachments based upon its findings of the effect of such proposed encroachments upon the flood-carrying capacity of the waterways, flood heights and hazards to life and property, with due consideration given to the results of similar encroachments constructed along the reach of waterway (emphasis added).
162. WIS. STAT. § 87.30 (Supp. 1969).
163. 7 Wis. Ad. Code RD 16.02(8). The statutory language on which this requirement is based is “effective flood plain zoning ordinance” (emphasis added). While defensible from the standpoint of wise flood plain management, the limitation of the statutory language to zoning may leave the regulations subject to attack. WIS. STAT. § 87.30(1) (Supp. 1969).
164. 7 Wis. Ad. Code RD 16.02-.04.
165. See note 118 supra.
166. See also 7 Wis. Ad. Code RD 16.02(1).
<table>
<thead>
<tr>
<th>STATE</th>
<th>POWER TO</th>
<th>KINDS OF CONTROLS</th>
<th>INCENTIVE FOR LOCAL GOVERNMENTS</th>
<th>STATE REVIEW OF LOCAL ORDINANCES</th>
<th>PENALTIES FOR VIOLATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Regulate</td>
<td>Establish Technical Standards</td>
<td>Condemn Existing Structures</td>
<td>None</td>
<td>Denial of state financial aid for specific flood control projects</td>
</tr>
<tr>
<td>CALIFORNIA</td>
<td>Local gov'ts. only. Acts to envision regulation only in relation to individual flood control project or flood insurance.</td>
<td>Local gov'ts. only with minimal state criteria</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>CAL. WATER CODE sec. 8325-8326, 8400-8415 (West Supp. 1968). sec. 8326, 8401 et seq.</td>
<td>Local gov'ts. with state assistance</td>
<td></td>
<td></td>
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<tr>
<td>CONNECTICUT</td>
<td>State on streams considered for flood protection sec. 25-4a</td>
<td>State sec. 25-4b, f</td>
<td>State sec. 25-4d</td>
<td>Encroachment lines, between which state permit is required to build sec. 25-4a</td>
<td>Practical desire to act before state</td>
</tr>
<tr>
<td>CONN. GEN. STAT. ANN. sec. 25-4a to g (1958) (Supp. 1969). Local gov'ts. consistent with state sec. 25-4g</td>
<td>Local sec. 25-4g</td>
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Table 2. SUMMARY OF COMPARISON OF FLOOD PLAIN MANAGEMENT STATUTES IN SIX STATES
<table>
<thead>
<tr>
<th>STATE</th>
<th>POWER TO</th>
<th>KINDS OF CONTROLS</th>
<th>INCENTIVE FOR LOCAL GOVERNMENTS</th>
<th>STATE REVIEW OF LOCAL ORDINANCES</th>
<th>PENALTIES FOR VIOLATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IOWA</strong></td>
<td></td>
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<tr>
<td></td>
<td>Regulate</td>
<td>Delineate Floodway</td>
<td>Establish Technical Standards</td>
<td>Condemn Existing Structures</td>
<td></td>
</tr>
<tr>
<td>IOWA CODE</td>
<td>State or local gov'ts.</td>
<td>State preeminent</td>
<td>State (implicit)</td>
<td>State</td>
<td>Practical desire to act before state</td>
</tr>
<tr>
<td>ANN. sec.</td>
<td>sec. 455A.35</td>
<td>sec. 455A.35</td>
<td>sec. 455A.35, § 5</td>
<td>sec. 455A.35, § 1</td>
<td>Mandatory</td>
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<tr>
<td>455A.33-39</td>
<td></td>
<td></td>
<td>Local regulations (sec. 455A.35, § 2)</td>
<td></td>
<td>sec. 445A.35, § 2</td>
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<tr>
<td>(Supp. 1968)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Nuisance abatement (sec. 455A.33, § 2)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$100/30 days; each day a separate offense (sec. 455A.39)</td>
</tr>
<tr>
<td><strong>MINNESOTA</strong></td>
<td>Local gov'ts. only</td>
<td>Local gov'ts. only</td>
<td>State</td>
<td>Zoning</td>
<td>Mandatory</td>
</tr>
<tr>
<td>MN, STAT.</td>
<td>sec. 4(1)</td>
<td>sec. 2(2)</td>
<td>sec. 4(1), (3), and sec. 5</td>
<td>sec. 4(a)</td>
<td>sec. 4(3)</td>
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<tr>
<td>sec. 104.04-.07</td>
<td></td>
<td></td>
<td>Other</td>
<td>Other</td>
<td></td>
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<td></td>
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<td>sec. 5(d)</td>
<td>sec. 5(d)</td>
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<td>Statute directs local gov'ts. to adopt regulations (sec. 4 (1))</td>
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<td></td>
<td></td>
<td>Letter of intent required by 6/30/70 (sec. 4(2))</td>
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<td></td>
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<tr>
<td>State</td>
<td>Localgov'ts only</td>
<td>Localgov'ts only</td>
<td>Localgov'ts only</td>
<td>Those consistent with FIA criteria</td>
<td>None</td>
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</tr>
<tr>
<td>TEXAS</td>
<td>8210-13, sec. 5</td>
<td>8210-13, sec. 5</td>
<td>8210-13, sec. 5</td>
<td>8210-13, sec. 5</td>
<td>None</td>
</tr>
<tr>
<td>WISCONSIN</td>
<td>State power to zone if local gov't. does not by 1/1/68. sec. 87.30(1) of RD16.02 (17)</td>
<td>Local gov't. Residual state power sec. 87.30(1)</td>
<td>State (implicit) sec. 87.30 (1)</td>
<td>Zoning sec. 87.30 (1)</td>
<td>None</td>
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<td></td>
<td></td>
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<td></td>
<td>Others suggested by regulations RD16.02(8)</td>
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</table>
F. Iowa

Enacted before the Minnesota Act, the Iowa flood plain management statutes\textsuperscript{167} join elements of the Connecticut, Minnesota and Wisconsin approaches. State establishment of encroachment limits\textsuperscript{168} (Connecticut) is combined with state encouragement, review and approval of local ordinances\textsuperscript{169} (Minnesota). Localities may also adopt encroachment limits consistent with state standards. State power thus acts as a spur to local governments to adopt their own limits (Wisconsin). The program clearly meets the standards for state coordination suggested by the Federal Insurance Administration.\textsuperscript{170}

G. Discussion

Of those discussed, the Iowa statute represents the best balancing of state and local authority, consistent with the need to insure sound flood plain management. The most critical private land use decisions are those affecting the floodway. It is there that development poses the greatest threat to other landowners. By definition, material encroachments on the floodway affect upstream properties.\textsuperscript{171} Because the floodway is flooded

\textsuperscript{168} IOWA CODE ANN. § 455A.35 (Supp. 1970), para. 1:
The council may establish and enforce regulations for the orderly development and wise use of the flood plains of any river or stream within the state and alter, change, or revoke and terminate the same. The council shall determine the characteristics of floods which reasonably may be expected to occur and may by order establish encroachment limits, protection methods and minimum protection levels appropriate to the flooding characteristics of the stream and to reasonable use of the flood plains. The order shall fix the length of flood plains to be regulated at any practical distance; shall fix the width of the zone between the encroachment limits so as to include portions of the flood plains adjoining the channel, which with the channel, are required to carry and discharge the flood waters or flood flow of such river or streams . . . (emphasis added).
\textsuperscript{169} Id. at para. 2:
The council may co-operate with and assist local units of government in the establishment of encroachment limits, flood plain regulations and zoning ordinances relating to flood plain areas within their jurisdiction. Encroachment limits, flood plain regulations, or flood plain zoning ordinances proposed by local units of government shall be submitted to the council for review and approval prior to adoption by such local units of government. Changes or variations from an approved regulation or ordinance as it relates to flood plain use shall be approved by the council prior to adoption . . . (emphasis added).
\textsuperscript{170} See note 116 supra.
more often and with faster currents, the likelihood of down-
stream damage from flotation of structures is greater. Con-
versely, the problems associated with development of the flood
fringe (the flood plain outside the floodway) are primarily those
of damage to individual landowners who choose to occupy that
place or community facilities placed there at local expense. It
is appropriate, therefore, to leave regulation of the flood fringe
to a level of government closer to the landowners while support-
ing local government efforts with state standards and assistance.
It should be emphasized, however, that the political environment
created by responsible public officials is more critical to a flood
plain management program than a particular statutory frame-
work. A strong state program operated by officials unduly symp-
pathetic to development interests could be worse than no state
action at all.

VII. CONCLUSION

In its Flood Plain Management Act, Minnesota has taken the
middle ground between state and local control of land use deci-
sions with respect to flood hazards. With the Shoreland Protec-
tion Act, however, the Flood Plain Management Act represents a
long step in the direction of state control over land use decisions
previously left to subordinate units of government. Given the
political environment surrounding flood plain regulation and the
necessity for sound engineering data to support such regulation,
the establishment by the Act of state standards and state review
of local regulatory action is appropriate.172

The effect of the Act on Minnesota towns is unclear. The
power of urban towns to regulate land use and the failure of the
Act to require review of their flood plain land use controls may
result in conflicts between town and county which could be
prevented by state review prior to adoption. Whether towns
not classified as urban towns have the power to zone the flood
plain is uncertain. Given the need for technical expertise to
regulate effectively and the need for coordination between
communities, the lack of such power would not be damaging to
the state-wide program and might be beneficial. The legislature
should, however, settle the questions of the duties of urban towns
and the powers of towns to regulate the flood plain by enacting
clarifying amendments.

172. See Beuchert, State Regulation of Channel Encroachments, 4
Flood insurance, while providing financial relief to those suffering flood damages, may have detrimental effects on flood plain management by encouraging development of the flood plain. Also, wise land use policy indicates that local communities should not wait to adopt flood plain land use controls until they are required to do so in order to become eligible for flood insurance.

Land use controls are no panacea, however, and flood protection, flood insurance and other tools each have potentially positive roles in flood plain management.

... Regulation of flood plain land use is subject to at least three cautions.

First, it should be remembered that proper regulation does not necessarily foreclose intensive use of the flood plain. It may permit erection of a high-rise building in a hazard area with proper proofing against flooding; it may hold an area free from development until a municipality is ready to cope with the demands which will be made for protection, storm damage, and other public services. To think of regulation as an exclusively negative instrument is inaccurate.

Secondly, the common aims of regulation are to prevent threats to public safety, to prevent victimization of unsuspecting property owners, and to restrict claims upon public agencies for protection and relief. It is not in itself an instrument for preserving open space or for keeping the stupid and improvident from foolish investment, although incidentally it may do so. Respect for regulation should not be weakened by attempts to use it directly for other purposes.

Thirdly, regulation in many instances is most effective in conjunction with other social measures, such as protection works, flood warning services, and land acquisition. It should not be thought of as sufficient in itself; enactment and enforcement of local regulations is only one, usually desirable, step.\textsuperscript{178}

\textsuperscript{173} White, supra note 136, at 60-61.