GIVINGS RECAPTURE: FUNDING PUBLIC ACQUISITION OF PRIVATE PROPERTY INTERESTS ON THE COASTS

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> [A] foolish man . . . built his house on the sand. The rain fell, and the floods came, and the winds blew and slammed against that house; and it fell—and great was its fall.[1]

I. Introduction

Fueled and maintained largely by government "givings"—government actions that increase the value of private property—to floodplain landowners, coastal floodplain development has increased dramatically over the last thirty years. Currently, coastal counties contain only seventeen percent of the land in the lower forty-eight states and over half of the nation's population.[2] Within twenty years another twenty-six million people will squeeze themselves into this strip of land along our coasts.[3] That increase in development and population density inevitably means that coastal floodplains will suffer ever-greater threats to human life, property, and the environment unless new floodplain land use management policies are

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[1] *Matthew* 7:26–27 (New American Standard Bible).

[2] Dana Beach, Coastal Sprawl: The Effects of Urban Design on Aquatic Ecosystems in the United States 1 (Pew Ocean Comm'n 2002).

[3] *Id.* at 1–2 ("At more than five times the density of the interior of the country, coastal population pressure is already great. Over the coming decades, the pressure will rise substantially."); *see* Fed. Emergency Mgmt. Agency ("FEMA"), National Mitigation Strategy: Partnerships for Building Safer Communities 1 (1995) ("From 1980 to 1993, the value of insurable property on the Atlantic and gulf coasts increased 179 percent, to $3.15 trillion."); *see also* David R. Godschalk et al., Natural Hazard Mitigation: Recasting Disaster Policy and Planning 4 (1999) ("Natural disasters have grown larger as more people and property have become exposed to natural hazards . . . . As more urban development takes place in such high-hazard areas, the risk of damage and injury from disasters multiplies."); Fed. Interagency Floodplain Mgmt. Task Force, Floodplain Management in the United States: An Assessment Report 3-2 to 3-6 (1992) [hereinafter Assessment Report] (noting increasing riverine, coastal, and arid region floodplain development).

adopted to curb development in high-risk and environmentally sensitive coastal floodplains. As geographer Gilbert F. White recognized over a half-century ago, "[f]loods are 'acts of God,' but flood losses are largely acts of man."[4]

Current federal, state, and local floodplain management policies have subsidized the costs of living in floodplains. Government entities continue to expend hundreds of millions of dollars annually to repair repeated and foreseeable damage to unwise and unsustainable private development and public infrastructure and facilities.[5] Instead of limiting flood-plain development, those policies and practices continue to maintain development against rising sea levels, climate change, extreme weather phenomena, and erosion.

Specifically, current government responses to flooding not only promote and maintain unwise development in coastal floodplains, but also artificially increase property values of high-risk[6] or environmentally sensitive properties.[7] Flood insurance, construction of flood control meas-

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[4] Gilbert F. White, *Human Adjustment to Floods*, *in* 1 GEOGRAPHY, RESOURCES, AND ENVIRONMENT: SELECTED WRITINGS OF GILBERT F. WHITE 12 (Robert W. Kates & Ian Burton eds., 1986).

[5] *See* William J. Siffin, *Bureaucracy, Entrepreneurship, and Natural Resources: Witless Policy and the Barrier Island*, 1 CATO J. 293, 297–98 (1981) (describing cumulative effect of numerous agency programs as subsidizing programs that stimulate coastal barrier island development). Although the National Flood Insurance Program ("NFIP") often is credited with spurring floodplain development—especially in coastal floodplains and on coastal barrier islands—it is not clear whether the NFIP alone provides sufficient incentives for such high-risk construction. *See* DIXIE SHIPP EVATT, NATIONAL FLOOD INSURANCE PROGRAM: ISSUES ASSESSMENT, A REPORT TO THE FEDERAL INSURANCE ADMINISTRATION 1 (1999) (review of thirty-six studies or reports on relationship between floodplain development and insurance availability did not conclusively demonstrate whether or not availability of flood insurance contributed to floodplain development). Rather, development pressure likely precedes, and then promotes, the flow of most federal and state subsidies in the form of infrastructure, flood controls, and risk allocation mechanisms.

[6] The term "high-risk development" refers to development that is economically unsustainable unless the property owner can externalize some or all flood-related costs of developing that property. Examples of high-risk development include property subject to repeated flood losses, or to catastrophic flood events causing flood losses that exceed the cost of similar development in an area with lower flood risks.

[7] Floodplains embody significant environmental resources. Coastal wetlands—salt marshes, swamps, and estuaries—purify water and provide essential habitat for a wide variety of flora and fauna. *See, e.g.*, James G. Titus, *Rising Seas, Coastal Erosion, and the Takings Clause: How to Save Wetlands and Beaches without Hurting Property Owners*, 57 MD. L. REV. 1279, 1289–90 (1998); Lisa A. St. Amand, *Sea Level Rise and Coastal Wetlands: Opportunities for a Peaceful Migration*, 19 B.C. ENVTL. AFF. L. REV. 1, 1–2 (1991). Additionally, coastal wetlands serve an important role as a flood control mechanism, providing areas that buffer upland areas against storm surges and wave action. *See, e.g.*, John Harte, *Land Use, Biodiversity, and Ecosystem Integrity: The Challenge of Preserving Earth's Life Support System*, 27 ECOLOGY L.Q. 929, 948–49 (2001) (describing impact of wetland degradation on ability of coastal wetlands to filter nutrients and sewage in floodwaters resulting from Hurricane Floyd); Joe F. Stevenson, *Louisiana's Oyster Lease Relocation Program: A Step Toward Common Ground*, 28 S.U. L. REV. 19, 20–21 (2000) (describing ecological necessity of coastal wetlands as fish and wildlife habitat and flood protection afforded by coastal wetlands in "acting as a buffer zone, absorbing the force of the storm surge and wind."); *see also* Nicholas A. Robinson, *Legal Systems, Decisionmaking, and the Science of Earth's Systems: Procedural Missing Links*, 27 ECOLOGY L.Q. 1077, 1088–89

ures, and liberal disaster relief minimize—and in some cases may even eliminate—floodplain landowners' perceptions of flood risk.[8] Land markets then capitalize these government subsidies and warped risk perceptions, resulting in property values that fail to reflect accurately the real costs of floodplain location. Consequently, when government entities purchase or condemn floodplain property, they must pay compensation based not only upon any "intrinsic" or improved value of the property rights condemned or taken, but also the additional value conferred upon the property as a result of past government responses to flooding. These artificially enhanced values result in a form of "double dipping"[9] by landowners who receive compensation for the value of past governmental givings in addition to whatever value the landowner may have created in the property through individual actions related to real market risks. Such double-dipping dramatically increases government costs of floodplain management by requiring double payments, both for ineffective past flood responses and for the costs of correcting those past mistakes through property acquisition.[10]

Thus, the perverse incentives created by government responses to flooding must be eliminated before any effective response to flooding can be implemented. This Article proposes a three-pronged approach. *First*, government must increase its emphasis on property acquisition as a response to repetitive flood losses and heightened flood risks on coastal floodplains.

Second, government must adopt a mechanism to avoid compensating landowners for increases in property value attributable solely to past government responses to flooding. While programs that mitigate flood hazards through public acquisition of high-risk private properties represent the best opportunity to remove unsound development and prevent new development from taking its place,[11] the high short-term costs of acquir-

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(2001) (discussing negative impact of sea level rise and development on ability of coastal wetlands and barrier islands to protect coasts from flooding).

[8] An example of this phenomenon is the way in which land markets appear to capitalize the benefits of flood control measures such as levees and seawalls by valuing properties protected by such structures as if those structural controls eliminated all risk of flooding. *See infra* notes 126–130 and accompanying text.

[9] Edward Thompson, Jr., *The Government Giveth*, ENVTL. FORUM, Mar.-Apr. 1994, at 26 ("For too long, we have been subsidizing the very uses of land we need to regulate in the interest of environmental protection. This has set the stage for double dipping in the public treasury by those who benefit from taxpayer largesse and then sue the government for damages when regulation frustrates their plans.").

[10] *See id.*; *see also* Mark W. Cordes, *Takings, Fairness, and Farmland Preservation*, 60 OHIO ST. L.J. 1033, 1035–37, 1072–75 (1999) (observing that governmental givings, such as farm subsidies and mortgage deductions, are responsible for substantial portion of land value and suggesting that imposing agricultural zoning districts is not inherently unfair largely because government, rather than landowner, action creates much of the value of agricultural land).

[11] *See, e.g.*, 42 U.S.C. § 4104c(e) (2000) (promoting pre-disaster mitigation of high-risk properties through property acquisition, relocation, or elevation of flood-threatened structures); *see also* FEMA, ACCOUNTABILITY REPORT FOR FISCAL YEAR 2000 28–32 (2001) [hereinafter ACCOUNTABILITY REPORT] (describing Repetitive Loss Initiative and Hazard

ing coastal properties limit the effectiveness of these programs. Ironically, much of the value of coastal properties—and hence the high cost of acquiring those properties—is the direct result of past government programs to mitigate or reallocate the risk of flood losses on coastal properties by attempting to guard coastal landowners against the risks and costs of floods. This Article proposes that the federal government counteract the high cost of coastal property acquisition programs by making past government subsidies subject to recapture as a "credit" to be offset against the government's cost to purchase or condemn redevelopment rights or other interests in the subject property.

To improve significantly the effectiveness of property acquisition programs, the government must recapture at least some past givings[12] when it condemns or purchases floodplain property. Implementation of what this Article terms a *givings recapture mechanism*—based upon existing standards for offsetting landowners' compensation to avoid payment for increases in property values solely attributable to past government actions—would rationalize coastal floodplain management by decreasing landowner double-dipping. Specifically, current just compensation clause jurisprudence permits the government to offset or avoid compensating landowners for value increments created directly by government action. Such effects are appropriate, for example, where the purpose of the governmental taking itself caused an increase in value to the landowner's remaining property.[13] Where the government-caused increase in property value can be clearly distinguished from other sources of value, the just compensation clause permits the government to avoid paying for increases solely attributable to its own activities. In the case of givings on coastal floodplains, the National Flood Insurance Program ("NFIP"), which currently provides flood insurance at below-market rates to property owners within flood-prone communities, provides the most dramatic illustration of a potential givings recapture mechanism. Rather than continuing to provide flood insurance at below-market rates, the NFIP should be amended to recognize explicitly the value of its rate subsidies to individual insureds and treat that amount as a credit to offset the cost of the federal government's future purchase of redevelopment rights or other property rights from those insureds. This givings recapture mechanism would permit coastal landowners to maximize use of their properties until they suffer catastrophic flood losses, would compensate landowners fully for their property upon condemnation or purchase by the government, and could sidestep political opposition to restrictive regulation of coastal floodplain land use.

Grant Mitigation Program).

[12] *See infra* note 83 and accompanying text.

[13] *See* United States v. Miller, 317 U.S. 369, 376–77 (1943) (prohibiting compensation for value increment attributable to speculation that tract taken would be among those benefited by proposed government project).

Third, property acquisition programs and givings recapture mechanisms must focus on a broad federal program specifically aimed at high-risk or environmentally valuable floodplain properties. A federal—as opposed to state or local—response is necessary because of the multi-jurisdictional nature of floodplains, flooding, and flood hazards. But the response must be targeted; too broad a scope could easily endanger such programs by exciting the vigorous political response that has doomed past attempts to effect a broad retreat from threatened shoreline.

Part II of this Article frames the conceptual and technical problems of continued unsustainable floodplain development, while Part III addresses the issue of government givings within floodplains that promote or maintain floodplain property values. Part IV analyzes some of the major current federal responses to floods and floodplain development in terms of the effects of those responses on government givings to floodplain property owners. Finally, Part V suggests changes to current federal floodplain management policy to recapture givings attributable to past government responses to flooding. These recaptured givings would then be used as a fund to promote additional public acquisition of redevelopment rights for high-risk or environmentally sensitive coastal floodplains.

II. The Problem of Coastal Floodplain Development

The problem of coastal floodplain development is twofold. First, coastal development represents a unique concordance of natural, social, economic, political, and climatological factors driving urbanization. Each of these factors is essential to understanding both the magnitude of the risks facing coastal development and the difficulty of reducing or eliminating those risks. Second, government actions with this dynamic coastal landscape have and will continue to have unintended consequences that increase the risks of coastal development and the difficulty of limiting or removing that development. Specifically, any government action within coastal floodplains can magnify the value of coastal properties by reducing or reallocating flood risks, increasing the perceived permanence of coastal properties, improving access to coastal properties, or otherwise transferring value to coastal real estate. This problem of government givings in coastal floodplains raises the fundamental question of the extent to which government must compensate property owners for past government actions that incidentally raised property value. This question is particularly important on the coast, where—absent government investments in flood protection, infrastructure, and risk allocation mechanisms—it is likely that property values would be substantially reduced.

A. The Conceptual Problem: "Takings" vs. "Givings"

The problem of increased coastal development is inextricably intertwined with the conceptual problem of when (and how much) the government should compensate landowners for physical takings, regulatory takings, and condemnations versus when (and how much) the government should be able to avoid compensating landowners for past givings. The past fifteen or so years have seen an intensifying conflict over the terms under which government can inhibit the ability of landowners to use their land as they see fit—without the payment of compensation.[14] At the center of the controversy is the inevitable tension between the rights and duties appropriately allocated to political communities on the one hand, and, on the other, the individuals benefiting from membership in those political communities. This tension has long been recognized in Fifth Amendment takings jurisprudence as the extent to which private individuals should bear burdens intended to benefit the community at large. As the Supreme Court stated in *Armstrong v. United States*, "[t]he Fifth Amendment's guarantee that private property shall not be taken for a public use without just compensation was designed to bar Government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole."[15] This Article respects the takings debate but primarily explores how the community can avoid compensating landowners when it determines that past public investments that incidentally benefited the property owners must be removed to forward new community goals and objectives.

Initially, the analytical structure governing this tension between individual property and community benefits developed under the constitutional analysis of "takings" of a person's property without due process of law or just compensation. But as the courts have defined the limits of government authority to limit use of private property,[16] commentators have

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[14] *See, e.g.*, Mark W. Cordes, *Property Rights and Land Use Controls: Balancing Private and Public Interest*, 19 N. ILL. U. L. REV. 629, 629–30 (1999) (discussing recent intensification of debate over balance between private property rights and public interest in regulating uses of property); Mark W. Cordes, *Leapfrogging the Constitution: The Rise of State Takings Legislation*, 24 ECOLOGY L.Q. 187, 187–88 (1997) ("The last decade has seen a growing property rights movement in this country.") [hereinafter *Leapfrogging the Constitution*]; Julian Conrad Jurgensmeyer, *Florida's Private Property Rights Protection Act: Does It Inordinately Burden the Public Interest?*, 48 FLA. L. REV. 695, 696 (1996) (describing legislation requiring compensation to property owners whose property values decrease because of government regulation as resulting from "obsession with regulatory takings"); Daryn McBeth, Note, *Public Need and Private Greed—Environmental Protection and Property Rights*, 1 DRAKE J. AGRIC. L. 112, 112–13 (1996) (noting revival of vigorous debate over scope of protections afforded by takings clause); William L. Inden, Comment, *Compensation Legislation: Private Property Rights vs. Public Benefits*, 5 DICK. J. ENVTL. L. & POL'Y 119, 119 (1996) (describing rise of property rights movement).

[15] 364 U.S. 40, 49 (1960).

[16] *See, e.g.*, Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency, 535 U.S. 302, 315 n.10, 335–43 (2002) (maintaining that except for categorical takings claims,

increasingly examined the responsive doctrine of "givings"—i.e., the extent to which individuals should retain increases in their property values attributable solely to government action in the event of a taking. Neither doctrine stands on its own terms, but each symbolizes much deeper principles and assumptions that go directly to the complex nature of the role of government and the balance between the rights and duties of individuals and communities.

Consider briefly the inherent paradox of those who argue that allegedly "uncompensated" restrictions on their use of property unjustly deprives them of benefits to which they, not the government, are exclusively entitled. In many instances this argument is at the center of what has been called the neoconservative movement. Neoconservatism is an effort to resist and turn back what have been seen as the abuses of the liberal state and its efforts to undermine individualism and free-market ideals. It is not a reach to suggest that the advocates of a tough takings doctrine believe in a package of values that elevate the right of the individual to compete in a competitive free-market economy and reward successful competitors for the contribution made by their individual skills.[17] In such an idealized

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regulatory actions must be assessed for taking in light of regulation's economic impact on landowner, interference with reasonable investment-backed expectations, and character of government action, as factors relate to affected parcel as a whole); Palazzolo v. Rhode Island, 533 U.S. 606, 626–28 (2001) (deciding that post-regulation purchaser or successive title holder of land not automatically barred from challenging regulation as taking); Dolan v. City of Tigard, 512 U.S. 374, 388–91 (1994) (holding that exaction of an easement demanded by government in exchange for discretionary government benefit such as building permit must be roughly proportional to impact of proposed development); Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1027–28 (1992) (holding that government regulation that prohibits all economically beneficial use of real property effects a taking under the Fifth Amendment); First English Lutheran Evangelical Church v. County of Los Angeles, 482 U.S. 304, 318–19 (1987) (holding that regulation temporarily denying property owner all use of property may be compensable as taking under Fifth Amendment); Nollan v. Cal. Coastal Comm'n, 483 U.S. 825, 837 (1987) (requiring "essential nexus" between regulation requiring exaction of private property in exchange for discretionary building permit and the harm the regulation seeks to avoid); Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419, 436–38 (1982) (government regulation authorizing permanent physical invasion of private property by third-party cable company constitutes per se taking). The impact of the recent *Tahoe-Sierra* decision on the continued vitality of categorical regulatory takings claims under *Lucas* is unclear, but an analysis of this new Supreme Court regulatory takings jurisprudence is beyond the scope of this Article.

[17] This traditional liberal-versus-conservative/neoconservative division on the issue of takings may, however, be a false dichotomy, as illustrated by recent efforts by generally left-leaning coastal property owners in Malibu, California, to prevent the state from imposing easements for beach access across their properties. *See, e.g.*, Brian Doherty, *Their Own Private Malibu*, WALL ST. J., July 16, 2002, at A16 (describing the apparent irony of finding "a mostly very wealthy and very liberal enclave [Malibu] suddenly rife with born-again property zealots"); Kenneth R. Weiss, *Not All Quiet on the Beachfront*, L.A. TIMES, July 12, 2002, at B8 (describing efforts of wealthy beachfront property owners to block public access to state-owned beaches seaward of their properties); Commentary, *Property Wrongs*, ORANGE COUNTY REG., Mar. 21, 2002, 2002 WL S443901 (same). But as the lead from the Wall Street Journal article—"What does it take to get liberals sounding like Ayn Rand in defense of property rights? Having their own property threatened"—suggests, the traditional left/right division on the issue of individual property rights and a strong takings

context, individuals are to operate within a competitive free-market culture in which they are rewarded for their ability and not provided with "handouts" of the kind favored by Rawlsian welfare states.[18]

To the extent individual actors have caused the value of privately owned property to increase through their own efforts there should then be clear limits on the ability of government to take the property or substantially reduce its utility or value without fair compensation. In other words, a state based upon free-market ideals and concepts of individualism and private property should not permit the government to share in increases in the value of property—the "profit"[19]—attributable to the individuals' own efforts or risk-taking entrepreneurial enterprises. This is as true for the fictional Ben Cartwright,[20] who helped tame the frontier wilderness by building the Ponderosa ranch, as it is in the case of a land speculator who does nothing more than take a risk to buy and hold land for the possibility of a market price increase.[21]

Of course, the ideal of the free-market entrepreneur is incomplete. Implicit within the assumption of individual rights that often accompanies free-market individualism and takings arguments is that the individual creates everything while the community is the ogre that steals from the virtuous individual.[22] But this position conveniently overlooks the political

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clause has more to do with the fact that many on the left have not been subject to significant government interference with their own property rights. Doherty, *supra*, at A16.

[18] *See generally* JOHN RAWLS, A THEORY OF JUSTICE (1972).

[19] *See* RICHARD A. EPSTEIN, TAKINGS: PRIVATE PROPERTY AND THE POWER OF EMINENT DOMAIN 12–14 (1985). Professor Epstein analyzes the Lockean theory of limited government in terms of restricting the state's ability to extract "monopoly rents from the exclusive legitimate use of force" ceded to the state by its citizens:

> By setting certain elements of value outside of public control, Locke provided an implicit answer to Hobbes's challenge by outlining a rule whereby the sovereign rule no longer generates monopoly profits [as it would under a Hobbesian theory of absolute sovereignty]. *The state gets what it needs to rule—its costs—and nothing more* . . . .

Id. at 13 (emphasis added); *see also* John Locke, *An Essay Concerning the True Original, Extent and End of Civil Government*, *in* THE ENGLISH PHILOSOPHERS FROM BACON TO MILL, 460–61 (Edwin A. Burtt ed., 1939) (1690) ("'Tis true governments cannot be supported without great charge, and it is fit everyone who enjoys a share of the protection should pay out of his estate his proportion for the maintenance of it. But still it must be with his own consent, i.e., the consent of the majority giving it either by themselves or their representatives chosen by them.").

[20] Ben Cartwright was the lead character of the 1959–73 television show "Bonanza."

[21] *See* Eric Kades, *Windfalls*, 108 YALE L.J. 1498, 1505–10 (1999) (distinguishing "windfalls" from situations where planning and development of superior information paid off for entrepreneurial risk takers).

[22] *See, e.g.*, Cordes, *Leapfrogging the Constitution*, *supra* note 14, at 237 ("Our tendency, however, is to accept the benefits of regulation as a given but complain about the burdens as an infringement of rights."); Michael DeBow, *Unjust Compensation: The Continuing Need for Reform*, *in* REGULATORY TAKINGS: RESTORING PRIVATE PROPERTY RIGHTS 55, 65–68 (Roger Clegg et al. eds., 1994) (arguing in favor of interpretation of just compensation clause that compensates condemnee fully for business and other consequen-

community's contributions to system stability, security, capital transfer, law, and other mechanisms that support individuals' opportunities to obtain, protect, and add value to assets.[23] Absent benign and facilitative community infrastructures and institutions, the individual would lack the stable base required to protect property—or at least would incur substantial transactional costs in providing for private security—and would bear all the cost and risk of opening new areas for development or improvement.

Consequently, the other side of the free-market individualism coin must apply with equal force—those who purport to rely on the free market, individual effort, and the sanctity of private property have no claim to benefits clearly and solely attributable to government actions. To the extent government actions have enhanced a person's property value, a rigid rule of valuation provides an unjust enrichment not created by the person through competitive efforts and abilities but rather by a communal distribution of benefits.

The case of David Lucas exemplifies this tension between takings and givings in a purportedly free market system. *Lucas v. South Carolina Coastal Council* developed one keystone in modern takings doctrine by holding that where a government regulation denies a property owner all economically beneficial use of land, a taking has occurred unless the government can demonstrate that background principles of property and nuisance law also would forbid use of the property.[24] Beyond the question of whether a taking occurred, *Lucas* raised the additional question of why two small lots on a regularly flooded strip of a sandy barrier island were worth almost $1 million in 1986:[25]

> Take the celebrated case of David Lucas, the real estate developer who recently won a $1.5 million takings judgment because he was denied permission to build houses on the beach at Isle of Palms, South Carolina. Whether or not one agrees with the decision in his case, the fact remains that both Lucas's ability to build on the beach and the value of his beachfront lots were aug-

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tial losses in addition to value of property taken, without acknowledging or discussing value potentially attributable solely to government action); TERRY L. ANDERSON & DONALD R. LEAL, FREE MARKET ENVIRONMENTALISM 47–58 (rev. ed. 2001) (describing instances of environmental damage caused by unwise or unsound government restrictions on private property rights for the ostensible purpose of environmental protection).

[23] *See* Clynn S. Lunney, Jr., *Compensation for Takings: How Much is Just?*, 42 CATH. U. L. REV. 721, 733–38 (1993). Lunney observes that to a considerable degree, the value of virtually all property held in this country reflects the social presence of our government, its laws and accompanying institutions. From time to time, this reflection leads some to suggest that, if a court insists on finding a taking when the government restricts certain individuals' property rights, it should award compensation based upon the difference between the value the property has as regulated in our civilized society, and the value the property would have outside our society.

[24] 505 U.S. 1003, 1029 (1992).

[25] *See id.* at 1006–07.

> mented by government action. Public authorities had constructed a bridge to provide access to the island, roads to drive on, water and sewage systems to serve the houses, and beach protection measures to prevent them from washing away. On top of that, the government has helped underwrite flood insurance to cushion the loss when those measures fail. All of these taxpayer-financed improvements contributed to the value of Lucas's property and in all likelihood spelled the difference between its being attractive for development and a financially worthless strip of shifting sand. *In effect, much of the government's financial exposure for taking the Lucas property was attributable to the government itself.*[26]

After Hurricane Hugo damaged his Isle of Palms properties, David Lucas himself acknowledged the role of government givings in supporting floodplain property owners. "The flood insurance program was the keystone . . . . You have to look at what the program has accomplished: jobs, economic development. Because of the federal flood insurance program, we now have tourism and a healthy economy."[27] Lucas received a financial windfall to the extent that the state had to compensate him for enhanced property value that occurred through state action rather than Lucas's individual investments in that property, either active (such as building improvements on the land) or passive (such as waiting for market forces to drive up values). The state paid two or even three times for value attributable to building and maintaining infrastructure, subsidizing insurance and providing more expensive police and fire services, and then paying some portion of Lucas's compensation at inflated development prices due to government's own investment of resources.

Government givings increase floodplain land values by providing or improving nearby infrastructure, repairing such infrastructure after floods, building structural flood barriers to reduce flood risks, and reallocating risks of flood damages from floodplain property owners to taxpayers in general.

To expand the effective use of property acquisition programs, current floodplain management policy must change to recognize and recapture givings. A givings recapture mechanism that promotes the ability of governments to expand the scope of property acquisition programs would have several advantages over current flood management policies. First, promoting property acquisition over other options such as open-space zoning, setback requirements, or prohibitions on development may avoid some

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[26] Thompson, *supra* note 9, at 22 (emphasis added).

[27] Thomas G. Donlan, *The Rights of Owners Don't Include a Federal Subsidy*, BARRON'S, June 1, 1992, at 10.

political opposition by compensating landowners for the value of property rights acquired by the government.

Second, givings recapture through treatment of subsidies as credits against a future acquisition necessarily would effect a *long-term* retreat from floodplain development. Each step of the retreat would be identified by floods causing substantial damage to floodplain properties. The flood, in effect, would perform the task of identifying floodplains suitable for removal of development by damaging properties where removal would be appropriate. Additionally, absent a flood of biblical proportions, such a long-term retreat would permit floodplain landowners to maximize the use and enjoyment of their current floodplain property uses without permanently externalizing the costs of that use and enjoyment to taxpayers.

Third, such a long-term property acquisition and givings recapture mechanism would gradually minimize *future* political opposition to removing floodplain development. Floodplain property owners are effective at mobilizing their resources for political action to increase or maintain the flow of government subsidies, but as property acquisition programs reduce the number of floodplain property owners in high-risk or environmentally sensitive floodplain areas, political pressures to continue development subsidizing in those areas should diminish.

B. The Technical and Managerial Problem: The Case for Limiting Coastal Floodplain Development

Beyond the conceptual issues of government takings, coastal floodplain management also demands attention to the unique problems created by situating human development in areas particularly susceptible to flooding. Flooding causes more damage in the United States than any other natural disaster,[28] with the possible exception of droughts.[29] Over half of U.S. communities, representing every state in the nation and approximately seven

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[28] *See* Oliver A. Houck, *Rising Water: The National Flood Insurance Program and Louisiana*, 60 TUL. L. REV. 61, 62 (1985) ("Flooding is the most frequent and the most costly natural catastrophe in the United States, if not the world. Nine of every ten natural disasters in this country are flood related."); *see also* GEN. ACCOUNTING OFFICE, FLOOD INSURANCE: INFORMATION ON THE FINANCIAL CONDITION OF THE NATIONAL FLOOD INSURANCE PROGRAM 1 (2001) [hereinafter 2001 NFIP FINANCIAL CONDITION REPORT] (Statement of Stanley J. Czerwinski, Director, Physical Infrastructure Issues); CHARLES A. PERRY, SIGNIFICANT FLOODS IN THE UNITED STATES DURING THE 20TH CENTURY—USGS MEASURES A CENTURY OF FLOODS (U.S. Geological Survey Fact Sheet 024-00, 2000), available at http://ks.water.usgs.gov/Kansas/pubs/fact-sheets/fs.024-00.pdf ("During the 20th century, floods were the number-one natural disaster in the United States in terms of number of lives lost and property damage.").

[29] Depending upon the method of measuring losses, some commentators argue droughts cause greater losses than flooding. *See* W.R. WALKER ET AL., MANAGEMENT OF WATER RESOURCES FOR DROUGHT CONDITIONS: NATIONAL WATER RESOURCES SUMMARY 1988–1989, at 150 (1991) ("When the true costs of drought are known, drought losses can dwarf the losses from other natural hazards.").

percent of the continental United States are subject to risk of flooding.[30] The Federal Emergency Management Agency ("FEMA") estimates that, within the approximately 19,600 communities participating in the NFIP,[31] nine to twelve million structures are at risk of flood damage.[32]

1. The Relationship Between Human Development and Flood Losses

Despite long experience with floods and floodplains, despite a host of government programs designed to reduce flood losses, and despite a century of flood control measures, damages from flooding have only increased. There is no certain measure of annual flood losses, nor has the actual amount of land subject to flooding been accurately determined.[33] The total costs of flooding are unknowable, partly because flood damage such as business losses, uninsured losses, tourism losses, and so on may be difficult to quantify, and partly because no agency systematically collects data on flooding losses.[34] It is clear though that the cost of flood-related disasters has increased substantially over the last century, not including billions expended on flood control and risk allocation measures.[35] Measurable flood-related losses now exceed an estimated $4 billion every year.[36]

The increasing trend in flood-related damages has one cause: human development in floodplains. Flooding does not cause economic damages to

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[30] *See, e.g.*, Raymond J. Burby & Steven P. French, *Coping with Floods: The Land Use Management Paradox*, APA J., July 1981, at 289.

[31] *See* 2001 NFIP FINANCIAL CONDITION REPORT, *supra* note 28, at 3.

[32] *See, e.g.*, 139 CONG. REC. S10,857–58 (daily ed. Aug. 6, 1993) (statement of Sen. Kerry) (noting eleven million structures at risk and only nineteen percent participation rate); JAMES R. QUINN, THIRTY YEARS IN DEEP WATER: THE NFIP AND ITS STRUGGLE FOR SIGNIFICANCE 26 (2000) ("By the early 1980s some 2 million policies had been sold, out of a potential 12 million buildings cursorily identified by the NFIP as being in special flood hazards. To this date, the estimated number of buildings exposed to hazards has not been revised."); *see also* The National Flood Insurance Program and Repetitive Loss Properties: Hearing on H.R. 1428 and H.R. 1551 Before the House Comm. on Financial Services, 107th Cong. 104 (2001) (statement of Rebecca Quinn, Legislative Officer, Association of State Floodplain Managers) (estimating number of buildings within special flood hazard areas at nine to eleven million).

[33] *See* ASSESSMENT REPORT, *supra* note 3, at 3-1; NANCY S. PHILIPPI, FLOODPLAIN MANAGEMENT—ECOLOGIC AND ECONOMIC PERSPECTIVES 22 (1996) (noting difficulties in measuring surface area of flood-prone land resulting from differing agency definitions of floodplains and dynamic nature of floodplain environments).

[34] For example, estimates of the costs of the 1993 Mississippi River floods range from approximately $3 billion to $15.6 billion to $20 billion. *See* PHILIPPI, *supra* note 33, at 35–37 (describing overall lack of data supporting reports on flood damages generated after 1993 Mississippi River floods); *see also* PERRY, supra note 28 (assigning $20 billion loss estimate to 1993 Mississippi River floods). The differences between these estimates are due largely to varying methods of assessing whether any particular damages actually are flood-related and to the paucity of data available to estimators. *See* PHILIPPI, *supra* note 33, at 35–37.

[35] NAT'L WILDLIFE FED'N, HIGHER GROUND: A REPORT ON VOLUNTARY BUY-OUTS IN THE NATION'S FLOODPLAINS 3 (1999) [hereinafter HIGHER GROUND].

[36] *See id.* at 3 & n.4; *see also* ASSESSMENT REPORT, *supra* note 3, at 1-1, 3-1 to 3-5.

uninhabited beaches or to wetlands in riverine floodplains. Rather, flooding causes economic damages because floodplains—if one ignores their propensity for being flooded—are well-suited for many types of human development.[37] The problem of such overdevelopment has been recognized—at least in general terms—for over a century.[38] Recognition of the problem has not curbed development. *Residential* coastal floodplain development, with its attendant infrastructure and urbanization, is a relatively recent phenomenon.[39] Beyond the obvious economic benefits of coastal areas as

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[37] *See* ASSESSMENT REPORT, *supra* note 3, at 1-1 ("Human settlements and activities tend to use floodplains, frequently interfering with the natural floodplain processes and suffering inconvenience or catastrophe as a consequence."); Christopher City, Note, *Duty and Disaster: Holding Local Governments Liable for Permitting Uses in High Hazard Areas*, 78 N.C. L. REV. 1535, 1536 (2000) (noting tendency of local governments to approve permits for development in floodplains despite state and federal incentives against such development).

[38] "As population has increased, men have not only failed to devise means for suppressing or for escaping this evil [flooding], but have, with singular short-sightedness, rushed into its chosen paths." W. J. McGee, *The Flood Plains of Rivers*, 11 FORUM 221, 221–22 (1891).

[39] This Article addresses primarily the problems of implementing property acquisition programs and givings recapture mechanisms with respect to coastal floodplain development. In contrast to coastal floodplains that have only recently been subject to development pressures, riverine floodplains historically have attracted urban development. Civilization itself arose from fertile floodplains of the Nile, Tigris, Euphrates, and possibly a now-submerged river in India, where annual floods deposited nutrient-rich sediments within floodplains to fertilize agricultural lands. *See* NAT'L RESEARCH COUNCIL, RESTORATION OF AQUATIC ECOSYSTEMS: SCIENCE, TECHNOLOGY, AND PUBLIC POLICY 176 (1992); NewScientist.com, *Drowned Indian City Could Be World's Oldest*, *at* http://www.newscientist.com/news/news.jsp?id=ns99991808 (last modified Jan. 18, 2002) (on file with the Harvard Environmental Law Review) (relating discovery of ancient city on banks of now submerged river in Gulf of Cambay that appears to predate earliest Egyptian and Mesopotamian civilizations by approximately 4000 years). In the United States, settlement and agriculture congregated around river floodplains to take advantage of the prime agricultural land, drinking and irrigation water, riverine food sources, and access to transportation and trade routes. *See* NAT'L RESEARCH COUNCIL, *supra*, at 176. While riverine floodplain development shares some characteristics with coastal development in terms of government givings that promote or maintain otherwise unsustainable floodplain development, the prospect of removing existing riverine floodplain development and preventing new development in its place raises issues of equity and justice fundamentally different from those found in most coastal floodplain development. *See* H. Crane Miller, *On the Brink: Coastal Location and Relocation Choices*, *in* PLATT ET AL., COASTAL EROSION: HAS RETREAT SOUNDED? 167, 171 (1992) ("People buy on the oceanfront because they 'want to be there,' find the risks acceptable, and often would locate there if flood and wind insurance were not available. In addition, they are far more likely than their riverine counterparts to rebuild in the same location if a disaster destroys their home."); HIGHER GROUND, *supra* note 35, at 34–35 (noting that programs to remove existing riverine floodplain development potentially problematic where local officials could use programs as excuse for economic gerrymandering and economically disadvantaged riverine floodplain landowners likely could not receive sufficient compensation upon condemnation of their property to fund purchase of upland properties with reduced flood risks); Jim Schwab, *"Nature Bats Last": The Politics of Floodplain Management*, ENV'T & DEV., Jan.-Feb. 1996, at 1 (reporting that lower-income residential uses are often located in riverine floodplains because of zoning and/or market forces); Saul Levmore, *Coalitions and Quakes: Disaster Relief and its Prevention*, 3 U. CHI. L. SCH. ROUNDTABLE 1, 3–18 (1996) (discussing theories justifying disparate levels of disaster relief awarded based on disaster type and characteristics of victim class). I anticipate that these issues will be the subject of a future article.

ports, fisheries, and similar uses,[40] residential coastal development largely lagged behind inland residential development patterns until the last three or four decades of the twentieth century. Before the twentieth century, beachfront and coastal floodplain development was uncommon.[41] And until the 1970s, landowners were reluctant to build on the coasts because of the high risk of hurricanes and storm-driven floods. When they did build, it was typically either low-cost structures that could be replaced if they were destroyed in a flood, or structures built well back from the shore behind the protection of dunes and on higher ground.[42]

Beginning in the 1970s coastal floodplain development increased dramatically in scale, cost, and quality.[43] The combination of magnitude and expense obviously multiplies the costs of flood-related damages and of mitigation and remedial programs. Nearly half of all new construction in the United States over the last three decades occurred on the coasts.[44] There are now 3.5 million seasonal homes in the United States, and vacation home ownership rates are growing at an accelerated rate, with much of this development occurring on coastal floodplains.[45] Additionally, as total U.S. population continues to grow, floodplain development pressures will only increase, placing an ever growing number of dwellings and people into high-risk or environmentally sensitive areas.[46]

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[40] *See, e.g.*, CORNELIA DEAN, AGAINST THE TIDE: THE BATTLE FOR AMERICA'S BEACHES 1 (1999) (describing early affluence of Galveston, Texas, becasue of ideal location for trade on Gulf of Mexico).

[41] *See id.* at 13 ("Until this century, few people lived near the beach. It was just too dangerous."). Residential coastal development must, of course, be distinguished from commercial development along the coasts. Because of issues such as access to transportation, trade, and ocean food sources, commercial centers have always appeared along the coasts. *See, e.g.*, BEACH, *supra* note 2, at 1 ("As long as humans have fished and traded, the coast has been prime real estate.").

[42] *See* DEAN, *supra* note 40, at 13.

[43] *See* ASSESSMENT REPORT, *supra* note 3, at 3-4 to 3-5 ("The coastlines of the United States have been attracting people in ever increasing numbers for several decades."); *see also* DEAN, *supra* note 40, at 13.

[44] DEAN, *supra* note 40, at 13 (citing PETER BENCHLEY, OCEAN PLANET 147 (1995)).

[45] *See* U.S. Census Bureau, Statistical Abstract of the United States: 2001, at 601 [hereinafter 2000 CENSUS STATISTICAL ABSTRACT] (Table No. 947, "Total Housing Inventory for the United States: 1980 to 2000"); *see also* Alison Stein Wellner, *Seasonal Affluenza: The Number of Seasonal Homes Is on the Rise, Making Wealthy Homeowners Easy to Spot*, FORECAST, Jan. 2002, at 1 (reporting that seasonal homes cluster on ocean or lake coasts or in mountains). From 1990 to 1995, seasonal housing increased by approximately six percent, and by twelve percent over the next five years. *See* 2000 CENSUS STATISTICAL ABSTRACT, at 601 (Table No. 947, "Total Housing Inventory for the United States: 1980 to 2000").

[46] *See* HIGHER GROUND, *supra* note 35, at 4 ("The Census Bureau projects that the population of the United States will increase to 322 million by the year 2020, a 23 percent rise. This population increase, combined with the shrinking availability of developable land, will intensify pressure to use high-risk areas."). Following the demand for developable coastal land, markets have reacted predictably by raising land values along the coasts. And individual property owners have responded by building ever larger and more expensive beachfront homes. *See* Dan R. Anderson, *Catastrophe Insurance and Compensation: Remembering Basic Principles*, 53 CPCU J. 76 (2000) (stating that development growth in high-risk floodplains is comprised of disproportionately wealthy individuals who tend to

The coastal development boom occurred largely as a result of three factors. First, the last thirty years have seen increased public perception of recreational opportunities within coastal floodplains.[47] People have flocked to the coasts to take advantage the interaction of land and sea.[48]

Second, access to the coasts has improved over the last thirty years. This is attributable to rising real incomes during the 1990s, more favorable capital gains treatment for the sale of existing homes,[49] and members of the so-called "baby boomer" generation seeking retirement housing and investments. These factors will continue to feed the high rate of development for the foreseeable future.[50] Furthermore, increased desire for security and "family retreats" away from crowded metropolitan areas since the September 11, 2001, terrorist attacks may continue to fuel vacation home sales despite a falling stock market and relatively slow economy.[51] Additionally, federal and state infrastructure improvements and subsidies—such as roads,[52] bridges, navigation aids and improvements,[53] wastewater treatment facilities,[54] flood insurance, disaster relief, and others[55]—opened

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build relatively more expensive housing). These larger houses permit owners to rent their beachfront properties as vacation homes, offsetting a portion of the increased lot costs. *See* EVATT, *supra* note 5, at 24.

[47] *See* EVATT, *supra* note 5, at 17–18 (stating that reasons for surge in floodplain development beginning in late 1960s "include growing appreciation for the kind of recreational opportunities offered on the coast paired with greater disposable income and more leisure time").

[48] Most notably, beachfront owners enjoy a perception of privacy from being able to step out their back door and partake of the illusion that their domain extends to the horizon. *See* Marc R. Poirier, *Takings and Natural Hazards Policy: Public Choice on the Beachfront*, 46 RUTGERS L. REV. 243, 259–69 (1993). Other amenities include access to water recreation and a pleasant climate. *See id.*

[49] In 1997, Congress amended the Tax Code to eliminate the capital gains tax on the first $250,000 (or $500,000 for married couples filing jointly) of capital gains from the sale of a home. *See* 26 U.S.C. § 121(a) - (b) (2000). "Thus, many families can now sell their homes and use the proceeds to buy both a smaller residence and a second vacation home—a strategy that is particularly attractive to the growing number of baby boomer families in the 'empty nest' phase of their lives." *A Yen for Homes Away From Home*, BUS. WK., Oct. 16, 2000, at 40.

[50] *See, e.g.*, Anne Marshall, *Home Sweet Second Home*, BRANDWEEK, Apr. 15, 2002, at 26.

[51] *See* Wellner, *supra* note 45, at 1.

[52] Road development may be primarily responsible for initial development in previously inaccessible floodplain areas, especially on coastal floodplains and coastal barrier islands. *See* DAVID R. GODSCHALK, COASTAL HAZARDS MITIGATION: PUBLIC NOTIFICATION, EXPENDITURE LIMITATIONS, AND HAZARD AREAS ACQUISITION 41 (1998).

[53] *See* EVATT, *supra* note 5, at 18 ("[D]evelopment on barrier islands could not have taken place without decisions by officials at various levels of government to improve access to these islands through construction of causeways, bridges and roads.") (citing SHEAFFER & ROLAND, INC., BARRIER ISLAND DEVELOPMENT NEAR FOUR NATIONAL SEASHORES 7 (1981)).

[54] The Environmental Protection Agency ("EPA") is authorized to make grants to local communities for the construction of wastewater treatment works. *See* 33 U.S.C. § 1281 (2000); *see also* Cape May Greene, Inc. v. Warren, 698 F.2d 179, 191–93 (3d Cir. 1983) (analyzing authority of EPA to refuse grants for otherwise permissible wastewater treatment facilities where facilities would tend to promote additional coastal development).

[55] *See, e.g.*, GODSCHALK, *supra* note 52, at 39–42. State and local infrastructure subsi-

new areas for development. Local governments seeking tourism-generated tax revenues have promoted coastal development.[56]

Third, coastal development has increased because the weather has cooperated. Hurricane severity waxes and wanes over an approximately twenty-five- to thirty-year cycle.[57] Nearly all coastal floodplain development from the 1970s through the mid-1990s occurred during a lull in hurricane activity.[58] Because hurricane activity appears to be increasing over the long-term, due in part to global warming, sea level rise, and the natural hurricane cycle, coastal floodplain development is at risk of suffering previously unheard-of flooding losses.[59]

The end result of this boom is heavily developed coastal floodplains that place a line of human beings, along with billions of dollars worth of development and public infrastructure, between the uplands and the sea. As this development intensifies, we may reach a point—if indeed we have not already passed it—where it will be too expensive to pull back, even if the cost of not doing so includes enormous economic and human losses and catastrophic environmental damage.

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dies appear to provide the initial base for coastal floodplain development, while federal subsidies promote "later expansion, improvements, repair, rehabilitation, or replacement of existing access or infrastructure necessary for community growth." *Id.* at 39.

[56] *See* Rutherford H. Platt, *Congress and the Coast*, ENVIRONMENT, July-Aug. 1985, at 12 ("Because they are also usually eager to increase their tax base and to share in the boom in coastal development, local governments are often more closely allied with the interests of the private developer than with those of the broader region, the state, and the nation."); *see also* City, *supra* note 37, at 1536–37 (2000) (describing tendency of local governments to interfere with state and federal flood hazard mitigation programs by permitting development in flood hazard areas).

[57] *See, e.g.*, *Report Says Conditions Favor More Hurricanes*, DALLAS MORNING NEWS, July 20, 2001, at 10A (describing predictions of likely decades-long period of increased hurricane activity along East and Gulf Coasts); Maya Bell, *Building Code Will Take State by Storm: Lost Lives and Billions in Damages from Hurricanes Drove the Effort to Impose Uniform Rules Next Year*, ORLANDO SENTINEL, May 27, 2001, at B1 ("After all, if the 1990s were indeed the beginning of a more ferocious cycle, hurricane specialists say it could last another 20 to 30 years."); *see also* John Herke, Comment, *Teething Pains at Age 25: Developing Meaningful Enforcement of the National Flood Insurance Program*, 7 TUL. ENVTL. L.J. 165, 182–83 (1993) (noting early 1990s potentially marked the beginning of a new, more active hurricane cycle).

[58] *See* William K. Stevens, *Storm Warning: Bigger Hurricanes and More of Them*, N.Y. TIMES, June 3, 1997, at C1 (discussing trend of escalating hurricane damage in the 1970s, 1980s, and 1990s and attributing damage to "expanding population and exploding development rather than more frequent or powerful storms").

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> [O]ver the past thirty years, while the coastal population has soared, the nation has experienced a relative lull in hurricane activity. But experts believe that the late-1990s mark the beginning of a period of unusually high hurricane activity. It may be in coastal areas especially that the inadequacies of the current mitigation systems will become the most evident.

GODSCHALK, *supra* note 3, at 36; *see* EVATT, *supra* note 5, at 15 (coastal and riverine floodplain development "grew at roughly twice the rate of population growth in the rest of the nation during a comparable period in the 1970s.").

Likewise, property values along the coasts—measured by the value of insured property—increased substantially during the last three decades.[60] This population growth shows no signs of slowing. By 2020, a projected twenty-seven million additional people will reside along the coasts.[61] Increased development increases the exposure of floodplain property owners to growing flood losses that are subsequently transferred, in large part, to taxpayers.[62] As a result of this concentration of ever more expensive development in the nation's coastal floodplains, property owners, governments, and private insurers face a growing certainty of catastrophic flood losses while merely paying lip service to evidence of changing weather patterns, rising sea levels, and global warming:

> Evidence increasingly points to global warming, whether caused by carbon emissions or a long term climate cycle, and the possibility of even more frequent and severe storms and flooding. Compounding the problem is the rapid population growth in high-risk areas. Currently, fifty percent of the population lives within fifty miles of the coastline and the percentage is growing. Three populous and high-risk states—California, Florida, and Texas (twenty-five percent of the U.S. population)—grew at twice the average growth of the United States in the period 1980 to 1993.[63]

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[60] *See* INSURANCE INST. FOR PROPERTY LOSS REDUCTION & INSURANCE RESEARCH COUNCIL, COASTAL EXPOSURE AND COMMUNITY PROTECTION: HURRICANE ANDREW'S LEGACY 8–9 (1995) [hereinafter COASTAL EXPOSURE AND COMMUNITY PROTECTION]. During the period 1980–1993, for example, insured property values in coastal counties along the Atlantic and Gulf coasts experienced percentage increases of at least 89% (Louisiana) and up to 248% (New Hampshire). *See id.*

[61] *See* BEACH, *supra* note 2, at ii ("Over the next 15 years, 27 million additional people—more than half of the nation's population increase—will funnel into this narrow corridor along the edge of the ocean.").

[62] "Natural disasters have grown larger as more people and property have become exposed to natural hazards." GODSCHALK, *supra* note 3, at 4. One commentator noted that in the face of estimated sea level increases of one to seven feet over the next century, "[w]e've essentially drawn a line in the sand and said, 'the sea shall not cross.' If it does it'll hit 2 trillion dollars worth of real estate." Bob Dart, *America's Threatened Coastlines*, ATLANTA CONST., June 4, 1994, at E1.

[63] Anderson, *supra* note 46, at 76 (internal citations omitted). From 1990 to 2000, Florida's resident population increased by 23.5%, Texas's by 22.8% and California's by 13.6% compared to 13.1% for the United States as a whole. *See* 2000 CENSUS STATISTICAL ABSTRACT, *supra* note 45, at 21 (Table No. 18, "Resident Population—States: 1980 to 2000").

2. The Relationship Between Floodplain Dynamics and Flood Losses

While floodplains may seem in many senses ideal for development, after one factors in the dynamic nature of floodplains, the unsustainability or impropriety of most floodplain development is obvious. In the most general sense, a floodplain is any area subject to flooding.[64] Riverine and coastal floodplains include areas adjacent to rivers or shorelines subject to inundation when water volumes exceed the carrying capacity of the river or stream channel or when storm surge, subsiding coastline, erosion, or wave action carry ocean or lake water inland from the shoreline. Coastal floodplains are part of a dynamic system extending both landward and seaward from the waterline. This system includes numerous landforms—inner continental shelf sand banks, coastal barrier islands, dunes, coastal wetlands and estuaries, beaches, and uplands.[65] The coastal floodplain system begins on inner continental shelf sand banks. These sand banks often provide sand for maintenance of barrier islands and mainland beaches.[66] Landward, coastal barrier islands—unstable, sedimentary landforms found predominately from the coasts of southern New England to the Texas Gulf coast—shield the mainland from the full force of incoming storms.[67] Still further landward, beaches and coastal wetlands form the first mainland barrier against the destructive effects of wave action, storm surge, and coastal flooding.[68] Behind these landforms lie dune lines—accumulations of sand topped with salt-resistant vegetation that mark the boundary of inland sand transport by storm and wave action.[69]

The risks that a particular floodplain will suffer flooding in any given year are unpredictable and unquantifiable. First, coastal floodplains themselves—and by extension shorelines contained within those floodplains—are dynamic, ever-changing landforms. "The boundaries of a floodplain are in a constant state of flux, which makes it important ecologically . . . .

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[64] *See* PHILIPPI, *supra* note 33, at 20–26.

[65] RUTHERFORD H. PLATT ET AL., COASTAL EROSION: HAS RETREAT SOUNDED? 2 (1992).

[66] Barrier islands are typically an Atlantic Coast landform, stretching from New England to the Texas Gulf Coast. *See* NAT'L RESEARCH COUNCIL, MANAGING COASTAL EROSION 23 (1990) [hereinafter MANAGING COASTAL EROSION].

[67] *See id.* at 23–25; Elise Jones, *The Coastal Barrier Resources Act: A Common Cents Approach to Coastal Protection*, 21 ENVTL. L. 1015, 1018–19 (1991).

[68] *See* Platt, *supra* note 56, at 14.

[69] *See* NAT'L RESEARCH COUNCIL, BEACH NOURISHMENT AND PROTECTION 20 (1995) [hereinafter BEACH NOURISHMENT] ("[A] precise or universal physical definition of a beach is not practical. For purposes of this study, 'beach' is defined in terms of its mobility. The landward edge of a beach, which in this broad definition often includes backing dune fields, is set by the maximum shoreward movement of water during a severe storm. The seaward extent is determined by the point at which substantial shore-perpendicular motion of sand ceases. Both of these limits depend on storm intensity during the period of observation.").

It is that fluctuating boundary that defines the ecologic floodplain."[70] Coastal floodplains constantly are subject to forces of erosion or accretion that cause dynamic shifts in the way these floodplains react to flooding. Wave action transports sediment landward from offshore sand sources, moves sand laterally "downshore" or "downdrift" from upshore or updrift beaches, or erodes sediment from shoreline bluffs to deposit the sediment as a narrow strip of constantly changing sand between dry land and the ocean.[71] Closer inland, beaches form from the erosion of headlands by wave action and by sediment transport from inland rivers.[72] Over time, beaches, dunes, and barrier islands alter their size, shape, location, and topography in reaction to erosive and accretive forces of wave action, storm surge, and rising sea levels. Each of these changes alters the ability of the coastal floodplain to protect inland areas from flooding.[73]

As a result, floodplains are uniquely impermanent and changeable landforms, subject to destruction or catastrophic alteration through erosion during flood events. Oceanfront property—including beaches, barrier islands, and other coastal landforms—is eroding constantly and hundreds of feet of beach may disappear in a single storm.[74] Compared to "dry" real estate that remains permanently in place and responds only to tectonic forces, floodplains are not "real land," but rather may disappear under the property owner's feet at any time.

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[70] PHILIPPI, *supra* note 33, at 21.

[71] *See* MANAGING COASTAL EROSION, *supra* note 66, at 23–29, 36–38 (describing beach formation along Atlantic, Pacific, Gulf, and Great Lakes coastlines).

[72] *See id.* at 36–40 (describing beach formation by river transport of sand or from eroding headlands along Atlantic and Pacific coasts).

[73] For example, along the Atlantic Coast, shorelines are eroding at an average of 2.6 feet per year. FEMA, PROJECTED IMPACT OF RELATIVE SEA LEVEL RISE ON THE NATIONAL FLOOD INSURANCE PROGRAM 9 (1991) [hereinafter PROJECTED IMPACT OF RELATIVE SEA LEVEL RISE]. Although the Pacific Coast also has localized areas experiencing erosion, much of that shoreline consists of crystalline rock bluffs that are relatively resistant to erosion. *See id.*; *see also* BEACH NOURISHMENT, *supra* note 69, at 20. But the rate of change on coastal floodplains can vary widely between different locations. *See Miller*, *supra* note 39, at 2–4 (noting widely varying rates of coastal erosion). Records of erosion rates are also difficult to maintain over the time scales necessary to provide meaningful measurements. In the late 1880s, surveyors established 200 survey monuments along the east coast of Cape Cod. *See* DEAN, *supra* note 40, at 17 (describing efforts of Henry L. Mandarin to map the Outer Cape). By the 1950s, surveyors could find only seventy-four of these monuments, and by 1979, only eighteen of the monuments remained. *See id.* at 18–19. Other coastal shorelines have similar long-term records of erosion, while still other estimates of coastal erosion rates depend on less accurate sources such as aerial photographs. *See* Miller, *supra* note 39, at 3. Although in some cases these records provide evidence of historical and projected erosion rates, many other areas are eroding at unknown rates for which there are no reliable historical records. Additionally, predicted and historical average rates of erosion fail to capture potentially rapid erosion resulting from extreme events. A single coastal storm can inundate large areas of coastline, cutting new inlets across barrier islands or wiping out entire beaches, bluffs, or other shoreline structures. *See id.* at 3–4 (noting shoreline erosion can manifest over periods of months, hours, or minutes during seasonal weather activity or during high-energy storms).

[74] Beaches respond to the forces of waves, tides, currents, and winds "on time scales ranging from hours to millennia." MANAGING COASTAL EROSION, *supra* note 66, at 23.

Second, flooding is a weather-driven phenomenon. For many reasons, predicting weather beyond a few days' forecast remains a speculative process at best and pure fiction at worst. Historical climate records are inadequate to provide accurate and reliable predictions of flood risk.[75] Additionally, the cyclic nature of weather phenomena introduces greater complexity to models attempting to predict where, when, and how much flooding will occur in any given region. For instance, precipitation and temperature can vary widely over decades-long cycles,[76] and hurricane activity in the United States apparently waxes and wanes on a twenty-five- to thirty-year cycle.[77] Finally, global warming—whether human-induced or otherwise—is also intensifying the unpredictability of flooding. With these rising temperatures come predictions of rising sea levels—from one to three feet—and potentially more extreme weather patterns and hurricane seasons.[78]

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[75] *See id.* ("Barrier beaches are perhaps the most dynamic coastal land masses along the open-ocean coast . . . . Barrier islands are typically low-lying, flood prone, and underlain by easily erodable, unconsolidated sediments. Thus, these land forms are especially difficult to develop because they are so dynamic."). In many cases, historical records of climate, temperature, and precipitation have been maintained for only a half century. *See* PHILIPPI, *supra* note 33, at 13–14 ("Systematic observations of climactic phenomena go no further back than, on average, 35 years . . . ."). "Considering the nation's short history of hydrologic record-keeping as well as the limited knowledge of long-term weather patterns, flood recurrence intervals are difficult to predict." INTERAGENCY FLOODPLAIN MGMT. REVIEW COMM., SHARING THE CHALLENGE: FLOODPLAIN MANAGEMENT INTO THE 21ST CENTURY 3 (1994) [hereinafter SHARING THE CHALLENGE]; *see also* HIGHER GROUND, *supra* note 35, at 58 (noting "concerns about the accuracy of some flood insurance rate maps, and further concerns that some home buyers may be critically uninformed about a building's flood history and risks . . . ."). It is possible to infer some information about climate before the twentieth century from sources such as tree rings and ice cores, but that information discloses only that temperature and precipitation vary widely over decades-long cycles while maintaining consistent long-term averages. *See* PHILIPPI, *supra* note 33, at 13–14.

[76] *See* PHILIPPI, *supra* note 33, at 14–15 ("Analysis of tree rings tells us that there have not been any long-term changes in mean annual precipitation over the past 400 years, but within that time frame there have been wide swings in precipitation variability over 20- to 30-year periods. The 45 years between 1920 and 1965, for example, was a period of low variability and low precipitation. As most of our precipitation gauges have been providing systematic data, on average, only since 1942, the historical record is probably of no more use in predicting precipitation than it is in predicting temperature trends.").

[77] This cycle last peaked in the 1940s and 1950s, when there was little development on the coasts. The 1970s and 1980s were, in contrast, a relatively mild period in which hurricanes struck the U.S. coasts with less frequency and intensity. *See, e.g.*, Jones, *supra* note 67, at 1024–26. Many experts now believe that the lull in hurricane activity that lasted from the late 1960s through the early 1990s has ended and such vastly destructive storms as Hurricane Andrew and Hurricane Fran are merely harbingers of hurricane seasons lashing the coasts with multiple storms of ever greater magnitude. *See supra* note 57.

[78] Along the U.S. coasts, FEMA has estimated that a one- to three-foot rise in relative sea levels over the next century could cause the loss of twenty-five to eighty percent of U.S. coastal wetlands, increase the total amount of shoreline subject to erosion, potentially increase the rate at which that erosion occurs, and increase extreme weather phenomena such as hurricanes and tropical storms. *See* PROJECTED IMPACT OF RELATIVE SEA LEVEL RISE, *supra* note 73, at 13–14 ("If global temperatures increase, changes in climate could occur that would affect hurricane activity. There has been scientific speculation about the effect of global warming on the frequency, intensity, and tracks of hurricanes."). FEMA's

Third, human-induced changes to floodplains can have dramatic impacts upon drainage within a floodplain and the ability of floodplain landforms to protect human development from flooding. Examples of such changes include urbanization of floodplains, flood control measures, and errors in mapping floodplains and flood risks. For example, urban development within coastal floodplains can substantially increase the amount of impervious surface within the floodplain and alter flood risks within that environment.[79] Moreover:

> A study by the American Geophysical Union found that population growth in high-risk states is disproportionately composed of wealthy individuals. Such individuals would tend to build more expensive properties, which increases the exposure. The combination of increased frequency and severity of catastrophes with exploding growth in high-risk areas raises ominous questions for the insurance industry and society in general.[80]

Although the potential losses from flood-related damages to coastal floodplain development are staggering—a Category 5 hurricane making landfall in Miami, Florida, for example, would cause an estimated $52.5 billion in insured losses[81]—these losses would be understandable if the

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report on sea level rise, however, also noted that other researchers have concluded that rising sea levels and increasing global temperatures may actually decrease the intensity of hurricanes and tropical storms. *See id* at 14. Other researchers have speculated that even temperatures on the low end of the possible range of projected increases could extend the annual hurricane season by twenty days, increase the severity of storms that do make landfall, introduce greater unpredictability in hurricane activity cycles, and potentially increase projected hurricane losses by thirty percent by 2010. *See* COASTAL EXPOSURE AND COMMUNITY PROTECTION, *supra* note 60, at 12.

[79] ASSESSMENT REPORT, *supra* note 3, at 1-11 to 1-12 (noting that local drainage conditions caused by increased development may cause flooding. "One study found that as population density increased from 100 to 13,000 persons per square mile, the peak rate of surface runoff became about 10 times greater."); *see also* BEACH, *supra* note 2, at 7–11 ("When more than ten percent of the acreage of a watershed is covered in roads, parking lots, rooftops, and other impervious surfaces, the rivers and streams within the watershed become seriously degraded."); *The National Flood Insurance Program and Repetitive Loss Properties: Hearing before the House Subcommittee on Housing and Community Opportunity of the Committee on Financial Services*, 107th Cong. 56 (2001) [hereinafter *Hearing on Repetitive Loss Properties*] (prepared statement of Rep. Richard H. Baker) (arguing that homeowner who was not subject to flood risk when property was purchased, but now owning a repetitive loss property because urban development with poor drainage planning has diverted floodwaters onto homeowner's property should not be responsible for losses and should not be forced to move).

[80] Anderson, *supra* note 46, at 76 (internal citations omitted).

[81] *See* COASTAL EXPOSURE AND COMMUNITY PROTECTION, *supra* note 60, at 11 figs. 2–6. The same intensity hurricane would cause $51.9 billion in insured losses in Ft. Lauderdale, Florida, $42.5 billion in Galveston, Texas, $33.5 billion in Hampton, Virginia, and $25.6 billion in New Orleans. *See id.* Importantly, these figures represent only potential insured losses, and do not include flooding damages (which are insured—with few exceptions—through the National Flood Insurance Program), uninsured property damages, or public costs of repairing damaged public infrastructure and disaster assistance payments.

individuals who made the decision to live in high-risk flood zones bore the costs of their decisions. But, as discussed in Part IV, numerous state and federal programs spread the burden of flood risks and damages across the nation as a whole, meaning that upland taxpayers who suffer relatively few floods must subsidize the lifestyle choices of those who choose to live and build in flood-prone areas.

III. The Problem of Government Givings in Coastal Floodplains

Programs for the public acquisition of floodplain properties are expensive because they must compensate landowners for the fair market value of the purchased property rights, whether the government purchases the entire fee interest, a subsidiary right such as a conservation easement, or development or redevelopment rights. Some of the value to be purchased can be measured either as the "intrinsic" value of the land or property rights—i.e., the value of bare ownership of the property—or as the value of improvements added to the property. Other components of the value of a parcel of real property arise not from the mere intrinsic value of ownership of the land (if any) or the value of improvements or rents, but rather from government action that increases the value of the parcel. Such government actions—known as "givings"—are the mirror image of government takings under the Fifth Amendment.[82] Where takings jurisprudence has long attempted to define those situations in which the government must compensate a property owner for some regulatory interference with property rights, scholars have only recently begun to ask the corresponding givings question: When may the government force owners to pay (or forego compensation) for the value of givings?[83]

The givings issue fundamentally concerns who should retain the increase in market value accruing to a particular parcel subsequent to a gov-

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The total cost of such a storm event would thus be far higher.

[82] *See, e.g.*, Abraham Bell & Gideon Parchomovsky, *Givings*, 111 Yale L.J. 547, 550 (2001) ("Like a reflection in a mirror, the massive universe of takings is everywhere accompanied by givings. For every type of taking, there exists a corresponding type of giving."); *see also* Cordes, *supra* note 10, at 1033.

[83] Givings jurisprudence has received little scholarly attention as a discrete field beyond Professors Bell and Parchomovsky's detailed taxonomy and analysis. *See* Bell & Parchomovsky, *supra* note 82, at 549 & n.3 ("[G]ivings—government distributions of property—have been largely overlooked by the academy.") (citing Windfalls for Wipeouts (Donald G. Hagman & Dean J. Misczynski eds., 1978); Louis Kaplow, *An Economic Analysis of Legal Transactions*, 99 Harv. L. Rev. 509 (1986); C. Ford Runge et al., Governmental Actions Affecting Land and Property Values: An Empirical Review of Takings and Givings (Lincoln Inst. of Land Policy, Working Paper No. WP96CR1, 1996) as primary exceptions to perceived lack of attention to field of givings by "mainstream of legal literature"). It is not the purpose of this Article to build on that analysis, but rather to explore the capacity for givings recapture mechanisms to affect floodplain management policy. Additionally, many scholars and commentators have recognized and explored some aspects of the givings issue in connection with other analyses. *See generally* Epstein, *supra* note 19; Cordes, *supra* note 10, at 1033; Thompson, *supra* note 9.

ernment project or regulation that provides some measurable benefits to that parcel.[84] For example:

> Assume a property owner has a tract of remote land worth $10,000. The government then builds a major highway near the property, creating new commercial opportunities and raising the total value to $60,000 over several years. A short time later, the government imposes an environmental restriction on the property, decreasing its value to $30,000. Although it might initially appear that the government actions diminished property values by 50% in this example, in fact the cumulative effect was to increase value by threefold.[85]

Givings jurisprudence is important in floodplain management because givings arguably make up a large portion of the value of a floodplain parcel. In the context of floodplain management, the $10,000 property is located on a coastal barrier island, formerly accessible only by ferry. Additionally, the property is improved with a small cottage worth an additional $10,000. After a bridge to the barrier island improves access to additional recreational uses for the state's growing tourism industry, and after substantial highway improvements to accommodate the increased traffic flow, the value of the land increases to $120,000 and demand for vacation rentals in the immediate area rises. Because of the availability of federal flood insurance, together with state and federal funds for improving local infrastructure and public facilities, the owner demolishes the cottage and erects a $250,000 beachfront mansion. Additionally, speculators, investors, and individuals wanting a vacation home on the beach purchase lots on the newly accessible barrier island, and land prices rise as the market reacts to the island's new accessibility. Suddenly the $10,000 lot is selling for $1 million.

The growth in givings and value does not stop with the sale of land. As the barrier island begins to erode—as it must if it is to remain an effective protective barrier for mainland communities—startled residents discover their back yards disappearing. Because of the highly concentrated, easily defined political interest group forming along the eroding beach, state and federal officials must react. The most effective short-term solution requires the Army Corps of Engineers and state agencies to begin sand replenishment projects—dredging sand from offshore littoral banks to deposit on the eroding beach at a cost of nearly $1 million per year.[86] As

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[84] *See supra* note 19 and accompanying text (discussing need to discriminate between value created by individual efforts and that created by government action).

[85] Mark W. Cordes, *The Public/Private Balance in Land Use Regulation*, 1998 DETROIT C.L. MICH. ST. U. L. REV. 681, 698.

[86] *See* BEACH NOURISHMENT, *supra* note 69, at 45–49 (discussing costs and benefits of beach nourishment projects).

this hypothetical illustrates, not only are government givings inextricably intertwined with private actions improving the value of coastal flood-plain properties, but coastal floodplain location also dramatically magnifies the impact of government givings.

In assessing the importance of the givings issue to coastal floodplain properties, it is necessary to recognize the sources of such givings. Governmental givings in floodplains take two forms—either direct givings or what this Article will call "fiat givings."

A. Direct Givings

Direct givings involve both physical infrastructure improvements that permit development to take place or expand and flood control measures that reduce the risk of flooding and flood-related damages.[87] Direct givings may include physical infrastructure projects such as roads, bridges, and wastewater treatment facilities that permit, promote, or maintain development within floodplains.[88] Alternatively, direct givings include structural and nonstructural flood control mechanisms, such as levees, dams, beach nourishment, disaster assistance, and flood insurance. All of these governmental responses to flooding reduce the risk of loss to floodplain property owners, transferring that risk to the taxpayers at large.

B. Fiat Givings

Additionally, floodplains—in contrast to "dry" or upland real estate—incorporate a source of givings value not found in other real estate. Where dry real estate generally suffers significant changes in topography, elevation, shape, etc., only on a tectonic time scale,[89] floodplains by their nature suffer

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[87] Professors Bell and Parchomovsky classified direct givings into a taxonomy of three categories—physical givings, derivative givings, and regulatory givings. *See* Bell & Parchomovsky, *supra* note 82, at 550–51. Physical givings result from direct grants of property interests by the state to a private actor, such as an issuance of broadcasting rights. *See id.* at 551. Regulatory givings occur when state regulations enhance the value of private property, such as a removal of regulatory restrictions on development. *See id.* And derivative givings, according to Professors Bell and Parchomovsky, arise "whenever the state indirectly increases the value of property by engaging in a physical or regulatory giving or taking," including state construction of public facilities that increases nearby property values. *Id.* Because this Article addresses reforms to floodplain management policy to permit and promote recapture of givings to floodplain property owners, it is not necessary to assess whether or where the concept of fiat givings introduced herein fits within the taxonomy described by Bell and Parchomovsky.

[88] *See* H. Crane Miller, Turning the Tide on Tax Dollars: Potential Federal Program Savings from Additions to the Coastal Barrier Resources System 2 (1989) (noting that increasing areas within the Coastal Barrier Resources System that are ineligible to receive federal spending of any kind would result in substantial savings in sewers, water supply, construction of bridges, causeways and roads, disaster relief, flood insurance, and shore protection).

[89] Of course, catastrophic geomorphological events such as volcanic or earthquake activity may also alter the properties of any real property in minutes or hours. But such

regular and predictable—in the sense that we know it will happen within some near-future time frame—inundation, erosion, and potentially catastrophic alteration. In other words, floodplains, as discussed above, are dynamic systems in which the boundary between land and water must change to reflect the impact of water on erodable land formations.[90]

In light of the substantial and knowable risks that floodplain property may cease to exist in useable form, land markets should discount floodplain property values versus upland property values to reflect these increased risks. Despite this impermanence of floodplain landforms, there is no clear relationship between land values and flood risk—"the existence of a discount for primary flood damages has never been empirically demonstrated."[91] Some of this lack of a discount for flood risks may be explained by the presence of flood control measures such as levees and other structural protections.[92] Additionally, land value discounts could be obscured by increased costs of construction in a floodplain to comply with regulations requiring elevation above designated flood levels or other "attributes unique to the floodplain" location.[93] Risk allocation measures may further obscure land value discounts by making taxpayers bear some of the risk of flood-

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events account for less than ten percent of all disaster-related economic losses. In comparison, climatological events, including floods, cause over eighty percent of all disaster-related economic losses in the United States. *See* DENNIS S. MILETI, DISASTERS BY DESIGN: A REASSESSMENT OF NATURAL HAZARDS IN THE UNITED STATES 4 (1999).

[90] Coastal barrier islands best illustrate this fact. Barrier islands are loose conglomerations of unconsolidated sediment that form seaward of beaches generally found along the Atlantic and Gulf coasts from New York to Texas. *See supra* notes 66–67 and accompanying text. These landforms are not permanent—they constantly alter their shape and size through erosion and accretion, sometimes disappearing altogether only to form again further down the shore. "Barrier islands also move with relation to the roads, buildings, and bridges. In some areas of the country, barrier islands are becoming narrower by action of the sea; in other areas, the islands are translating shoreward; and in still other areas, the islands are translating seaward." William J. Donovan, Barrier Islands: Public Values and Public Commitment, Remarks Prepared for a Barrier Islands Workshop Panel Discussion at the National Symposium on Preventing Coastal Flood Disasters 2 (May 23–25, 1983) (on file with the Harvard Environmental Law Review).

[91] U.S. ARMY CORPS OF ENGINEERS, EMPIRICAL STUDIES OF THE EFFECT OF FLOOD RISK ON HOUSING PRICES 5 (1998) (on file with the Harvard Environmental Law Review). The Army Corps of Engineers study did observe a few instances where property values may reflect increased flood risk, including properties that recently experienced flooding and some floodplain properties that capitalized the cost of flood insurance into the property value. *See id.* at 13. *But see* Janet Furman Speyrer & Wade R. Ragas, *Housing Prices and Flood Risk: An Examination Using Spline Regression*, 4 J. REAL EST. FIN. & ECON. 395, 406 (1991) (concluding that floodplain land values are discounted largely to capitalize cost of flood insurance with some additional portion of property value discounts possibly attributable to inconvenience or other factors, but noting that repeated flood losses do not cause further discounts to land values).

[92] *See* James M. Holway & Raymond J. Burby, *The Effects of Floodplain Development Controls on Residential Land Values*, 66 LAND ECON. 259, 269 (1990) (noting generally higher values for parcels protected by flood control devices).

[93] U.S. ARMY CORPS OF ENGINEERS, *supra* note 91, at 5; *see also* Holway & Burby, *supra* note 92, at 260 ("Once houses are built [on floodplain property] extra construction costs incurred in elevating or floodproofing residences may equal any decline in the value of vacant land, hence no effect is observed.").

plain development. Moreover, particularly with respect to coastal properties located on beaches or barrier islands, it may not be reasonable to compare the value of beachfront properties with those located further inland, solely because ocean frontage may be such a unique asset that any capitalization of flood risk is obscured.[94] Finally, a primary factor in the lack of obvious discounts for the risk of flood damages to properties located within a floodplain is the length of time since any particular property has experienced flooding. Communities with recent floods appear to suffer flooding-related property value discounts, but the longer a community goes without experiencing a significant flood, the less likely the land markets are to discount property values for flood risk, even though relative flood risks may be equivalent.[95]

Structural protections alone, however, should not completely eliminate flood-risk discounts to property values. As the 1993 Mississippi floods conclusively illustrated, even the most extensive levee system in the world fails, and when levees fail, they fail completely and empty the river into the formerly protected areas.[96] Likewise, all other structural protections—including groins, seawalls, dams, and channel improvements—fail during floods that exceed their design characteristics. Similarly, risk allocation measures such as disaster assistance and flood insurance do not cover even a majority of most flood-related losses.[97] Land markets should incorporate this information, but there is no clear indication that they do so.[98]

The concept of fiat givings may resolve at least a part of this dilemma. This Article defines "fiat givings" as givings that result where the government declares—either expressly or by implication—that it will not

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[94] *See* U.S. ARMY CORPS OF ENGINEERS, *supra* note 91, at 5 (noting potential benefits for properties within floodplains such as water access and "nice views" are difficult to assess separately from negative factors of floodplain location).

[95] *See, e.g.*, Holway & Burby, *supra* note 92, at 269 (noting difference in apparent property value discount between cities experiencing recent floods and those that had not experienced recent flooding); U.S. ARMY CORPS OF ENGINEERS, *supra* note 91, at 13 (noting no studies showing long-term negative effects of recent flooding on property values).

[96] *See* White, *supra* note 4, at 18 ("Levees and floodwalls carry a special disadvantage; if overtopped by a flow greater than the design flood, the maximum loss occurs."); *cf.* RUTHERFORD H. PLATT, DISASTERS AND DEMOCRACY: THE POLITICS OF EXTREME NATURAL EVENTS 6 (1999).

[97] Flood insurance covers only approximately four million of twelve million eligible structures. *See infra* notes 164–165 and accompanying text.

[98] *See* U.S. ARMY CORPS OF ENGINEERS, *supra* note 91, at 31–32 (stating that studies of the effect of flood risk on real estate values indicate that land markets may discount property values for location within a floodplain, but there is no clear indication that any discount for flood damages is capitalized into the fair market value of floodplain properties). The tendency of floodplain property owners to underestimate or minimize flood risks has long been recognized. *See* Gilbert F. White, *Strategic Aspects of Urban Floodplain Occupance*, *in* 1 GEOGRAPHY, RESOURCES, AND ENVIRONMENT 84, 92 (Robert W. Kates & Ian Burton eds. 1986) (1960) ("There is widespread ignorance of the flood hazard and a tendency to minimize it. Many people building or buying in floodplains are unaware of the precise hazard they are running or grossly misinterpret the technical estimates. This applies even in places where there have been public plans for flood protection. A man says he need not worry about floods because a 200-year flood occurred the year before.")

permit a floodplain landowner's property to move, erode, or disappear. By declaring its intent to guard floodplain properties against future encroachments by nature, government has in effect created "dry" land by fiat.[99] Land protected by this fiat is no longer subject to the risk that it will one day disappear under water, but rather is "backed by the full faith and credit" of the federal or state government issuing the fiat.

The West Hampton Dunes beach restoration project on Long Island provides a strong example of fiat givings. Following litigation over rapid erosion of beachfront property caused by poorly designed erosion control structures, the federal government, together with state and local governments, promised in a 1994 settlement agreement with the residents of West Hampton Dunes to invest approximately $80 million in beach nourishment projects over thirty years to restore and maintain properties and beaches within the West Hampton Dunes community.[100] Despite the fact that the project presumably will terminate at the end of thirty years, reopening the area to threats of erosion and inundation, property owners expect that the government will be there to continue funding an implied guarantee that their property will continue to exist:

> In theory, in year 31, long after the time when most here will have any concern about the area, that project will terminate . . . . But we're betting for our heirs that having spent $80 million and having created one of the most beautiful public beaches in the United States that, thirty-one years from now, government is not going to walk away from that.[101]

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[99] In commenting on a draft of this Article, Professor Poirier suggested that the term "fiat givings" could be more accurately characterized as government-created reliance that the existing state of events will be maintained. I prefer the "fiat givings" construct in the context of givings because, in addition to the element of reliance on a sovereign entity, "fiat" also connotes that value has been created where it did not exist before, purely by the exercise of the sovereign will. By declaring that it will essentially maintain in place coastal floodplains as if they were dry land, the federal and state governments have created a system in which heretofore non-valuable real estate can now be traded in the land markets as if it possessed the relative permanence of dry land, similar to a fiat money system in which non-valuable paper can be exchanged for valuable goods and services because the government has declared that the paper shall be recognized as valuable. The fiat givings there result both from the governmental declaration that something without value or with only limited value now possesses such and from the degree of reliance land markets and property owners place on that declaration.

[100] DEAN, *supra* note 40, at 42–43. The village of West Hampton Dunes was incorporated to advance the interests of coastal floodplain property owners whose properties had been completely eroded and wiped out during storms in 1992 and 1993. The "village" was largely underwater at the time it entered into a settlement agreement that required federal, state, and local agencies to construct a new beach and pump millions of tons of sand to restore properties submerged by erosion. *Id.*

[101] *Id.* at 43 (quoting LONG ISLAND COASTAL ALLIANCE, INC., PRESERVING LONG ISLAND'S COASTLINE: A DEBATE ON POLICY 22 (1995) (reporting statement of attorney John J. O'Connell at the Alliance's 1994 annual conference)).

Fiat givings arise from government actions declaring that some government entity will do what is necessary to protect floodplain properties from ceasing to exist. And government entities reinforce and increase the value of fiat givings whenever they protect private property at taxpayer expense. Government must pay for these fiat givings when it purchases floodplain property. Although the value of these givings is unclear, it is absurd that government must pay these increased costs in a buyout program that amounts to a tacit admission that the fiat has been rescinded.

IV. The Problem of Current Government Floodplain Management Policies

Floodplain management draws from two opposing schools of thought: (1) "stand your ground," and (2) retreat.[102] Current policy favors the former. Federal and state approaches to floodplain management have succeeded to some extent in preventing losses from relatively minor floods, but have largely failed to move development from high-risk floodplains and to prevent new development in those floodplains. This failure has occurred primarily because current floodplain management policy actively promotes—even mandates—structural flood control measures and risk allocation mechanisms, yet provides incentives only for local governments to promote land use management within floodplains. In other words, current programs minimize the risks and costs of floodplain development—thus providing substantial givings to floodplain property owners—while failing to place any meaningful burden on individuals who choose to build within the floodplains.[103]

It is unclear whether federal and state flood hazard mitigation programs drive initial floodplain development.[104] The relationship—to the

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[102] Neither school has ever held absolute sway on federal and state policy.

> Obviously, the floodplains of the United States will not be permanently evacuated and returned to nature merely because of the annual bill for their occupancy . . . . Neither will they be occupied as intensely as consistent with other relevant physical and cultural conditions solely because, irrespective of cost, suitable engineering and land-use devices can be developed to curb or prevent floods . . . . *Wherever the adjustments are not satisfactory, as attested by crippling flood losses, wherever a regressive occupance obtains, or wherever the floodplain resources are not used as fully as practicable, a readjustment may be in the public interest.*

White, *supra* note 4, at 15–16 (emphasis added).

[103] *See* City, *supra* note 56, at 1542–43 (federal and state programs that provide benefits to local governments that purport to regulate land use within floodplains but that do not hold local governments accountable for unwise development fail to create any meaningful incentive to prevent floodplain developments); *see also* Burby & French, *supra* note 30, at 296 ("[I]t is far easier to allow floodplain encroachment and design new construction to withstand flood damage than it is to keep development away from valuable natural areas.").

[104] *See* Evatt, *supra* note 5, at 1 ("None of the studies [of the impact of the NFIP on floodplain development incentives] offer irrefutable evidence that the availability of flood

extent it can be observed—is likely a function of preexisting development pressures, perceived flood risks, and access to political institutions by affected property owners.[105] After the initial phase of floodplain development, however, "federal involvement in community development tends to increase with population and with each program that expands the capacity of individual systems to accommodate growth."[106] With each wave of expanded public support and public infrastructure, floodplain development increases and thereby expands its ability to claim an ever larger share of federal flood control and mitigation subsidies. This, in turn, further exposes the community to greater potential losses from flooding.[107]

Government responses to flooding fall into three categories: structural mitigation, risk allocation, and land use management.[108] For purposes of this Article, structural mitigation comprises those acts taken to reduce physically the impact on persons and property directly damaged

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insurance is a primary factor in floodplain development today. Neither does the empirical evidence lend itself to the opposite conclusions . . . . Development pressure in most of the areas studied existed before NFIP and continued even after NFIP was selectively withdrawn (as in the case of the Coastal Barrier Resources Act)."); *see also* Siffin, *supra* note 5, at 298:

> Many people want to live at the ocean's edge and can afford to buy land and housing on the barrier islands—under existing conditions. These conditions have largely been created by the concatenating effects of a number of federal programs. None of these bureaucratic enterprises were intended primarily to foster and promote barrier-island settlement. Some of the most important were established with no attention to their effects on the islands. But at least one may have been created with some awareness that it would encourage urban settlement on floodplains and other valuable locations: the Federal Flood Insurance Program.

Evatt's 1999 review of studies on the impact of the NFIP on floodplain development disputes Siffin's argument that the NFIP is primarily responsible for floodplain development, and similar arguments by others, as myth. *See* EVATT, *supra* note 5, at 26–27.

[105] For example, development on coastal barrier islands almost always precedes federal funding of infrastructure improvements and risk allocation mechanisms:

> Federal subsidization on the coastal barriers has been most evident in roads, bridges, and causeway access; water storage and water treatment facilities; wastewater treatment facilities; shore protection; flood insurance subsidies; and disaster assistance. *In almost all instances, federal funding came after initial development of the community was financed by private capital, by local or state revenue bonds, or by other nonfederal sources.*

H. Crane Miller, Shifting Sands of Coastal Barrier Development Subsidies 6 (May 1983) (unpublished manuscript on file with the Harvard Environmental Law Review) (published in Preventing Coastal Flood Disasters: The Role of the States and Federal Response, Ass'n of State Floodplain Managers, Natural Hazards Research and Applications Information Center Special Pub. No. 7, May 1983) (emphasis added).

[106] *Id.* at 7.

[107] *Id.* at 7; *see also* Siffin, *supra* note 5, at 298 (while each federal flood control and risk allocation program by itself serves a plausible purpose, in aggregate federal programs act to stimulate barrier island development).

[108] *See* RAYMOND J. BURBY & STEVEN P. FRENCH, FLOOD PLAIN LAND USE MANAGEMENT: A NATIONAL ASSESSMENT 5 (1985).

by natural disasters such as flooding. On coastal floodplains, structural mitigation measures include groins, jetties, seawalls, beach nourishment projects, and other mechanisms to prevent or reverse erosion at a particular point on the coastal floodplain. Risk allocation mechanisms share or pool risks of catastrophic losses of different magnitudes across a broad population. These mechanisms may include relatively focused risk allocation mechanisms such as flood insurance under the NFIP or more broad-based risk sharing mechanisms such as disaster relief. Land use management and planning attempts to minimize the actual population at risk from floods by guiding development away from high-risk floodplains.[109]

Land use planning efforts, unlike physical and visible structural mitigation measures and politically advantageous risk allocation payments, have only recently begun to receive significant attention as a floodplain management technique.[110] As a result, government givings under structural mitigation and risk allocation programs continue to promote and maintain the very development that land use management and planning would otherwise limit.

A. Structural Mitigation: Armoring and Beach Nourishment

The best, and most obvious, example of government givings to floodplain property owners occurs with the public funding of structural mitigation measures. Structural mitigation confers both direct givings and, to a lesser extent, fiat givings on floodplain landowners.[111] Specifically, these

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[109] *See* RAYMOND J. BURBY ET AL., CITIES UNDER WATER 1–2 (1988):

> Floodplain land use management can reduce the susceptibility of property to flood damage by affecting *where* and *how* new urban development takes place. By guiding growth to locate outside of identified flood hazard areas, for example, land use management programs seek to eliminate the possibility of flood damage. Since many communities believe floodplains have locational advantages that should not be foregone, floodplain land use management also includes measures that allow building on the least hazardous portions of the floodplain if that development is elevated or constructed in such a way that the potential for flood damage is minimized.

Id.; *see also* Schwab, *supra* note 39, at 1 (describing role of floodplain land use management on reducing flood risks and providing for economically efficient uses of floodplains).

[110] *See, e.g.*, NATURAL HAZARD MITIGATION, *supra* note 3, at 31–33 (describing growth of land use management approaches to floodplain hazard mitigation since the 1970s); Schwab, *supra* note 39, at 1 ("More than any other disaster in recent U.S. history, . . . the Mississippi Valley floods of 1993 brought home to dozens of communities the importance of implementing effective land use regulations in floodplains."). *See generally* BURBY & FRENCH, *supra* note 108.

[111] Some commentators use the terms "hazard mitigation" and "land use management planning" interchangeably. *See, e.g.*, NATURAL HAZARD MITIGATION, *supra* note 3, at 5 (defining "natural hazard mitigation" generally as "advance action taken to reduce or eliminate the long-term risk to human life and property from natural hazards" and including both physical measures such as building grades and dune maintenance as well as plan-

physical projects, which include beach armoring (such as construction of groins, jetties, breakwaters, seawalls, and revetments) and sand replenishment programs,[112] promote direct givings by reducing risks from floods within their design capacities and promote fiat givings by creating the implication that if the government funded such projects once, it will likely do so again.

Although state and local governments, as well as private property owners, have built flood control structures since the colonial period, the federal government was virtually absent from this process until the Flood Control Act of 1936.[113] Since then, however, the federal government has taken on an expanding role in building, financing, and regulating structural flood control measures.[114] Today, primary responsibility for funding and regulating flood control structures lies with the federal government.[115]

Structural responses to flood risk have produced mixed results. Some structures are effective at reducing damages from floods within their design capacity.[116] Properly constructed groins, seawalls, revetments, and breakwaters can be used successfully to reduce coastal erosion and increase the flood protection capacity of the natural shoreline.[117] Likewise, requirements that buildings and other floodplain improvements be elevated above a base flood elevation level are effective at preventing damage to those structures for many floods below the base flood elevation.[118] And beach nourishment programs have been successful at counteracting wave and storm erosion by providing soft barriers[119] that absorb energy from

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ning measures to guide new development away from hazards).

[112] *See id.* at 33–34 (explaining that early coastal flood responses focused on hard structural controls such as "[s]eawalls, revetments, groins, jetties, and offshore breakwaters" while later efforts employed more soft controls such as beach nourishment); MANAGING COASTAL EROSION, *supra* note 66, at 29–35 (describing uses and effects of inlets, jetties, dredged entrances, dams, groins, seawalls, and breakwaters on coastal erosion and flood control).

[113] 33 U.S.C. §§ 701a–709b (2000).

[114] For a discussion of the history of federal and state flood control efforts as a facet of government responses to natural or human-induced disasters, see generally PLATT, *supra* note 96, at 1–26.

[115] *See id.*

[116] *See, e.g.*, MANAGING COASTAL EROSION, *supra* note 66, at 56–61.

[117] *See id.*

[118] *See id.* at 67 (noting "[d]amage to structures located along the shore in some cases can be reduced by relatively straightforward engineering and construction procedures to ensure the building's survivability of a 100-year storm event" and recommending elevation above 100-year wave crest elevation); *see also* Miller, *supra* note 73, at 30 fig. 2.2 (displaying intact beachfront house elevated on pilings with remains of completely destroyed "slab-on-grade" structure in foreground).

[119] Structural protections on coastal floodplains often are divided into "hard" or "armoring" structures and "soft" structures. *See* MANAGING COASTAL EROSION, *supra* note 66, at 56. Hard structures include seawalls, groins, offshore breakwaters, and jetties. *See id.* Soft shoreline protection structures include beach nourishment and sand transport mechanisms. *See id.* Importantly, only beach nourishment projects increase the net amount of sand in the near shore littoral system. And other structural controls have either no effect or protect shorelines by interfering with littoral transport along the shore to cause accretion of

waves and storm surge before the water reaches inland structures.[120] Although these structural flood control measures are expensive, they do reduce flood risks for properties located within the protected area.

Structural responses to flooding, however, transfer substantial givings to floodplain property owners, leading to both unsustainable development choices within the floodplain and increased property values.[121] Structural flood control measures often induce the misperception that the flood risk within the protected area has been eliminated—rather than merely reduced—creating a false sense of security in property owners behind the structural protection.[122] As a result of this underestimation of remaining flood risks, property owners tend to overdevelop properties behind the structural barriers.[123] And underestimation of flood risk may also lead some floodplain property owners to ignore building codes requiring elevation above flood levels or to increase the density and value of their development.[124] Consequently, even structures that eliminate flood risk for all floods

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sand at the structure. *See id.* at 60.

[120] It is unclear whether beach nourishment projects provide any substantial net benefits outside of the community. On the one hand, beach nourishment provides substantial benefits, including reduced storm damages to properties insured under the NFIP or that would be eligible for disaster relief, increased net-foreign tourism revenue, and increased property values. *See* BEACH NOURISHMENT, *supra* note 69, at 48–49. But many of these benefits may be offset by the dynamic nature of the coastal floodplain community—as the community is improved, property owners within the improved community increase the density of their development. Additionally, neighboring coastal communities may attempt to compete for tourism revenue by engaging in their own high-density development, which in turn may lead to greater beach degradation downshore. *See id.* at 48–49, 4–5 (describing flaws in current cost-benefit analysis used by Army Corps of Engineers to assess whether to proceed with any given beach nourishment project).

[121] Structural flood controls are public goods, and consequently, structural flood controls subsidize land values and may promote additional development in floodplains protected by those flood controls. "If a flood control project (e.g., levee) is constructed, there is no easy way to market the demand for flood control since nonpaying individuals cannot be excluded without government intervention such as taxes." David J. Plazak, *Flood Control Benefits Revisited*, 112 J. OF WATER RESOURCES PLAN. AND MGMT. 265, 265 (1986) (noting that willingness of floodplain property owners to pay for flood repairs is underestimated).

[122] *See, e.g.*, White, *supra* note 98, at 90 ("Although most federal flood-control works are built to protect against a project flood and conceivably will one day, however infrequently, be exceeded by a larger flow, there is a universal disposition to believe that the rare flow will never come."); PLATT, *supra* note 96, at 6; NATURAL HAZARD MITIGATION, *supra* note 3, at 31 ("Structural projects may also create a false sense of security, increasing the amount of property at risk of flooding as people and businesses locate behind levees and flood walls."); Houck, *supra* note 28, at 110–11 (describing increased development of St. Tammany parish as result of levee construction).

[123] *See* White, *supra* note 98, at 90 (discussing tendency of completion of flood control structures to "accelerate[ ] movement into the floodplain"); *see also* HIGHER GROUND, *supra* note 35, at 7 (describing tendency of floodplain landowners and developers to treat land protected behind levees as uplands, rather than floodplains subject to flood losses in the event of levee failures).

[124] *See* HIGHER GROUND, *supra* note 35, at 7–8 (describing tendency of floodplain landowners to ignore flood risks in construction planning when properties are protected by levees and other structures); Houck, *supra* note 28, at 110–12 (describing Corps of Engineers benefit-cost analysis taking into account assumption that property owners behind

within their design capacity may perversely cause even greater damages in the event of a flood in excess of that capacity.[125] Property owners in floodplains without flood control structures may tend to estimate accurately, or even overestimate, the risk of flooding. This is likely, given that individuals tend to be most aware of, and most responsive to, flood risks within the few years immediately following a flood.[126] When floodplains are left unprotected, floods are relatively common events and their regular occurrence may cause individuals to estimate correctly the most beneficial level of investment in floodplain improvements. But "[s]ince floodplain investments are made in the expectations that floods can be controlled, the damages from infrequent, but major, floods are astronomical."[127]

Additionally, some structural flood control measures—in reducing flood risks at a particular point along the shoreline—may also transfer flood risks downshore or increase flood risks at the structure's location over time. Small, cumulative changes to floodplains upshore may have significant impacts upon how the downshore beaches and floodplains react to later flooding. For example, jetties, groins, breakwaters, and other hard structures meant to trap sand within a particular beach and coastal floodplain provide substantial givings to protected properties, at least in terms of reduced short-term flood risks.

Those same flood and erosion control measures have well-documented negative impacts on nearby, unprotected beaches. Waves and ocean currents transport sand and sediment laterally along the coastline, as well as perpendicular to the coastline. Structures such as jetties attempt to trap sand at a particular point in this littoral transport system. When poorly constructed, these structures trap sand that would otherwise nourish downdrift beaches, causing the downdrift beaches to erode at increased rates. At their worst, these structures can carve deep inlets in barrier islands, or destroy downdrift mainland beaches.[128] As in the West Hampton Dunes case,[129] government may end up paying for *both* the initial project constituting the giving as well as property damages caused downshore by

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new levee would build below base flood elevations).

[125] *See, e.g.*, PLATT, *supra* note 96, at 74 ("In the event of a flood or coastal storm exceeding the design capacity of the project, the ensuing losses on the new development were much larger than if that area had remained unprotected and relatively less developed.").

[126] *See* sources cited *infra* note 326 (describing heightened awareness of need for mitigative action immediately following flooding and waning of that awareness within months or years immediately after the flooding).

[127] James B. Tripp, *Flooding, Who is to Blame?*, USA TODAY, July 1, 1994, at 32.

[128] *See, e.g.*, DEAN, *supra* note 40, at 42–43 (discussing Corps of Engineers jetty and groin system that caused rapid erosion and inundation of large sections of Westhampton beach); Jeremy N. Jungreis, *Drawing Lines in the Shifting Sands of Cape Canaveral: Why Common Beach Erosion Should Not Yield a Compensable Taking under the Fifth Amendment*, 11 J. LAND USE & ENVTL. L. 375, 376 (1996) (analyzing takings claims of wealthy beachfront property owners suing under theory that harbor improvements by federal government "obstructed 130 years of sand that would otherwise have reached their beach").

[129] *See supra* notes 100–101 and accompanying text.

that same project. Such risk transfers provide givings to property owners protected by the structure while transferring additional flood risks to downshore property owners. Because downshore owners will not immediately perceive the increased flood risks, there will not be any effect on downshore property values, resulting in an average net positive increase in value for all properties affected by such flood controls.

B. Risk Allocation: Disaster Assistance and Flood Insurance

In contrast to structural flood control mechanisms that create givings by attempting to reduce overall flood risk, risk allocation techniques provide givings to floodplain property owners by transferring a portion of the risk of flood damages from the floodplain property owner to taxpayers without decreasing the actual risk of flood losses. While the federal government maintains several programs with risk allocation components, the primary mechanisms for risk allocation with respect to flood-related risks are disaster relief and flood insurance.

1. The Disaster Relief Act

The Robert T. Stafford Disaster Relief and Emergency Assistance Act ("Disaster Relief Act")[130] is the flagship federal risk allocation program. The Disaster Relief Act establishes procedures[131] under which the President may declare that a "major disaster"[132] or an emergency[133] exists within a defined area upon request of the governor of the State where the flooding or other disaster occurs.[134] This determination releases federal

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[130] 42 U.S.C. §§ 5121–5206 (2000).
[131] *See id.* §§ 5122(1)–(2), 5170.
[132] 42 U.S.C. § 5122(2) provides:

> "Major disaster" means any natural catastrophe (including any hurricane, tornado, storm, high water, winddriven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought), or, regardless of cause, any fire, flood, or explosion, in any part of the United States, which in the determination of the President causes damage of sufficient severity and magnitude to warrant major disaster assistance under this Chapter to supplement the efforts and available resources of States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby.

[133] 42 U.S.C. § 5122(1) defines "emergency" as:

> [A]ny occasion or instance for which, in the determination of the President, Federal assistance is needed to supplement State and local efforts and capabilities to save lives and to protect property and public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States.

[134] *See* 42 U.S.C. §§ 5170 & 5191 (setting out procedure for declaration of major dis-

funds and agency aid to individuals and local governments.[135] Originally, Congress intended disaster relief to be a limited program to supplement efforts of states to respond to large-scale emergencies that could exceed the capacity of the state infrastructure.[136] However, since the 1950s, the Disaster Relief Act has burgeoned into a massive "entitlement" program while localities and states have largely abandoned their disaster response roles.[137] Vice President Al Gore's 1993 National Performance Review laid the blame for this expansion squarely on states and localities:

> The system as a whole encourages state and local elected officials to ask for maximum federal disaster assistance. Requests have increased approximately 50 percent over the last 10 years. Even minor emergencies have been awarded full compensation . . . . To prevent the federal government from becoming the states' first-line resource in every emergency, objective criteria are needed to replace political factors affecting decisions about disaster declarations and ensuing response.[138]

Although the scope of disaster relief has been increasing for some time, recent expansions of the program have increased dramatically the ability of the executive and legislative branches to engage in "disaster gerrymandering" and to award disaster aid as off-budget pork to their con-

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aster and procedure for declaration of emergency, respectively).

[135] A declaration of a disaster or emergency opens a broad array of federal assistance to the affected region. Federal agencies may respond by making available federal equipment, supplies, facilities, personnel, medicine, and food. *See id.* §§ 5170(b)(1)–(b)(2), 5192–5193(b) (providing for limited assistance by federal agencies to communities suffering declared emergency, up to a maximum of $5 million, although greater assistance may be available in limited circumstances). A disaster declaration also authorizes federal agencies to provide "work and services to save lives and protect property," including debris removal, search and rescue, emergency medical care and facilities, and construction of temporary public facilities. *See id.* § 5170(b)(3). Individuals in disaster-stricken areas may be entitled to receive unemployment and lost income assistance, *id.* § 5177(a); grants of up to $10,000 (adjusted for inflation) per individual or family, *id.* § 5178(a), (f); food stamps or supplies, *id.* §§ 5179(a), 5180(a); relocation assistance (in limited circumstances), *id.* § 5181; legal services, *id.* § 5182; and crisis counseling, *id.* § 5183; among other disaster-related aid. *See also* 44 C.F.R. §§ 206.1–12, 206.61–206.67, 206.141–206.191 (2002).

[136] *See* 42 U.S.C. § 5122(1), (2) (defining "emergency" and "major disaster" as events in which federal aid is necessary to "supplement" State and local recovery efforts); *id.* § 5121(a), (b) (relating Congress' findings and intent to assist "[s]tate and local governments in carrying out their responsibilities to alleviate the suffering and damage which result from such disasters . . . ."); PLATT, *supra* note 96, at 15, 17–23 (describing how "supplemental" nature of federal disaster assistance to states and local communities has eroded as federal government shoulders ever-larger shares of disaster relief burden).

[137] *See* PLATT, *supra* note 96, at 12–26 (describing gradual expansion of federal role in providing disaster relief).

[138] FEMA, RECOMMENDATIONS AND ACTIONS, FEMA 03: CREATE RESULTS-ORIENTED INCENTIVES TO REDUCE THE COST OF A DISASTER, available at http://govinfo.library.unt.edu/npr/library/reports/FEMA3.html. (last visited Apr. 24, 2003) [hereinafter NATIONAL PERFORMANCE REVIEW]; *see also* PLATT, *supra* note 96, at 58.

stituencies.[139] "Decisions about federal disaster relief are not constrained by immediate budget considerations. Most funds for disasters in the recent past have been provided by supplemental appropriations, which are exempt from federal discretionary spending limits."[140] The George H. W. Bush and Clinton administrations issued record numbers of disaster declarations and expanded the amount of federal aid available to disaster victims, while state and local governments attempted to garner an ever larger slice of the disaster aid pie.[141]

The availability of federal aid promotes givings to floodplain property owners through the promise of direct aid to offset losses from flood disasters, and through the promise that future aid will likewise protect property owners from the consequences of living or building in a flood-plain.[142] Critics have charged that the increased number of disaster declarations and amount of disaster aid flowing to state and local governments are inequitable and may promote development within disaster-prone areas, especially floodplains.[143]

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[139] *See* PLATT, *supra* note 96, at 57–58. Platt argues:

> This gradual expansion of the federal role has been accompanied by a growing sense of entitlement to federal disaster assistance on the part of state and local governments and individual disaster victims. At the same time, there has been increasing politicization and nationalization of natural disasters, fueled by the virtually instant national media attention given to disaster events. This media attention makes it hard for state and local officials not to seek the maximum amount of aid from the federal government and makes it equally difficult for federal officials to deny such requests.

NATURAL HAZARD MITIGATION, *supra* note 3, at 28.

[140] NATIONAL PERFORMANCE REVIEW, *supra* note 138.

[141] *See* Damon Darlin, *A New Flavor of Pork (Federal Disaster Aid)*, FORBES, June 5, 1995, at 146 (reporting that the George H. W. Bush administration, during 1992 elections, promised to increase federal disaster relief to victims of Hurricane Andrew from 75% of uninsured costs to 85% of uninsured costs; the Clinton administration increased these amounts to 90% of uninsured costs for victims of 1993 Mississippi River floods and 100% of uninsured costs for victims of 1994 Northridge, California, earthquake). The Clinton administration issued more disaster declarations than any previous administration. *See* PLATT, *supra* note 96, at 22.

[142] The Disaster Relief Act allows individuals who were eligible to obtain flood insurance under the NFIP but did not do so as of the time of the disaster one opportunity to receive disaster assistance. *See* 42 U.S.C. §§ 5154, 5154a(a), 5172(d) (2000). Those individuals thereafter are prohibited from receiving specified types of disaster assistance for previously damaged property unless they thereafter obtain and maintain flood insurance for the property. *See id.* §§ 5154(b), 5154a(a).

[143] *See, e.g.*, PLATT, *supra* note 96, at 38–41 (noting growing recognition by government, environmentalists, floodplain management experts, and other commentators that disaster relief has questionable moral justification and likely supports unsound development decisions within disaster-prone areas); COASTAL HAZARDS MITIGATION, *supra* note 52, at 39 ("[F]ederal disaster assistance and flood insurance also has facilitated coastal development by transferring much of the risks and costs of development from the private sector to the public sector"); *see also* City, *supra* note 56, at 1537–39 (noting connection between disaster relief and development).

Besides direct givings, disaster relief also may promote fiat givings to floodplain property owners. The federal government gradually has expanded the number of presidential disaster declarations by decreasing the magnitude of the disaster necessary to qualify for such a declaration.[144] Disaster aid has become an implied promise that the federal government will always provide states, communities, and individual property owners with a disaster safety net.[145] States and localities in turn have incorporated this disaster entitlement and spend fewer resources on hazard mitigation, while individuals ignore or discount flood risks.[146]

2. National Flood Insurance Program

Congress created the NFIP through the National Flood Insurance Act of 1968[147] in response to the perceived problem created by mounting disaster relief payments for flooding,[148] the inefficacy of flood protection and prevention measures,[149] and the unavailability of commercial flood insurance to owners of property in floodplains.[150] Pursuant to the Act, FEMA must identify and map all communities containing floodplain areas subject to a one percent (or greater) average yearly risk of flooding—also known as "100-year floodplains."[151] These maps—Flood Hazard Boundary Maps

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[144] *See supra* notes 139–141 and accompanying text.

[145] *See* HIGHER GROUND, *supra* note 39, at 8 (discussing increasing role of federal government in providing disaster assistance and decreasing allocation of resources by states and individuals to hazard mitigation).

[146] *See, e.g.*, *id.* (noting reductions in state hazard mitigation budgets and fact that "[t]he widespread assumption that the federal government will pay to rebuild flooded-out homes following a disaster declaration has proven to be a substantial disincentive for homeowners in high-hazard areas to purchase or renew federally sponsored flood insurance policies."); *see also* NATIONAL PERFORMANCE REVIEW, *supra* note 138 (recommending development of objective criteria to prevent federal government "from becoming the States' firstline resource in every emergency . . .").

[147] Pub. L. No. 90-448, 82 Stat. 572 (1968) (codified as amended at 42 U.S.C. §§ 4001 (2000)).

[148] *See* 42 U.S.C. § 4001(a)(1) (noting increasing burden on national resources caused by disaster relief payments to victims of flood disasters); *see also id.* § 4002(a)(1) ("annual losses throughout the Nation from floods and mudslides are increasing at an alarming rate, largely as a result of the accelerating development of, and concentration of population in, areas of flood and mudslide hazards"); H.R. REP. NO. 90-1585, at 89–96 (1968); S. REP. NO. 93-583, at 2–3 (1973).

[149] *See* 42 U.S.C. § 4001(a)(2) (noting that "despite the installation of preventive and protective works and the adoption of other public programs designed to reduce losses caused by flood damage, these methods have not been sufficient to protect adequately against growing exposure to flood losses . . .").

[150] *See id.* § 4001(b)(1) ("many factors have made it uneconomic for the private insurance industry alone to make flood insurance available to those in need of such protection on reasonable terms and conditions"); *see also infra* note 174 and accompanying text (describing withdrawal of private insurers from coastal markets).

[151] 42 U.S.C. § 4101(a); *see also* 44 C.F.R. § 59.1 (defining "Area of special flood hazard" as "the land in the flood plain within a community subject to a 1 percent or greater chance of flooding in a given year," and defining a "100-year flood" as a "flood having a one percent chance of being equaled or exceeded in any given year").

("FHBMs")[152] or Flood Insurance Rate Maps ("FIRMs")[153]—delineate areas at elevations expected to be flooded during such 100-year floods.[154]

Based upon these FHBMs, FEMA offers flood insurance to residents of communities containing any portion of a 100-year floodplain, provided that the community has opted to participate in the NFIP.[155] To qualify for participation within the NFIP, a community containing a 100-year floodplain must adopt local land use ordinances and building codes that meet minimum federal standards for floodplain development, primarily requiring all new construction to be flood-proofed or elevated above base flood elevation levels.[156] Based upon flood maps for the participating community, FEMA establishes premium rates at which NFIP flood insurance will be offered within the community. For most structures, premium rates must reflect actuarial flood risks for the insured structures.[157]

For structures insured before January 1, 1975, or the effective date of the original FIRM for the community in which the structures are located, the Act authorizes FEMA to charge subsidized risk premium rates that—although not actuarially sound—would increase participation in the program.[158] Although FEMA and Congress initially anticipated that such pre-FIRM structures would gradually be eliminated from the NFIP insurance pool through attrition, the absolute number of pre-FIRM structures has not appreciably diminished since the program's inception.[159] Conse-

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[152] 44 C.F.R. § 59.1 ("Flood Hazard Boundary Map (FHBM) means an official map of a community issued by the Administrator, where the boundaries of the flood, mudslide (i.e., mudflow) related erosion areas having special hazards have been designated as Zones A, M, and/or E."). The zones designated on the FHBM refer to the type of hazard existing in each area mapped: "Zone A" refers to an area of special flood hazard ("SFHA"), "Zone M" refers to an area of special mudslide hazard, and "Zone E" refers to an area of special flood-related erosion hazard. *See id.*

[153] A FIRM is "an official map of a community on which the Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community." 44 C.F.R. § 59.1.

[154] For a discussion of the likelihood of increasing inaccuracy in mapping flood hazard boundaries and other flood-related risks, see *supra* note 74 and accompanying text. Importantly, only the outer boundaries of a mapped floodplain (i.e., the highest elevations within the floodplain) have a one percent risk of flooding. Lower elevations within the floodplain may have substantially higher risks of flooding in any given year.

[155] *See* 44 C.F.R. § 59.22(a). While the NFIP now requires that FEMA complete a risk study and FIRM for a community before allowing that community to participate in the program, Congress and FEMA established an "emergency" phase of the program to permit flood-prone communities to opt into the program before flood risks had been mapped for those communities. *See* 42 U.S.C. § 4056(a); 44 C.F.R. § 59.3.

[156] *See* 42 U.S.C. §§ 4001(b), 4012(c)(2), 4102; *see also* 44 C.F.R. §§ 59.22, 60.

[157] 42 U.S.C. § 4014(a)(1). These rates are referred to as "actuarial rates." *See* 44 C.F.R. § 61.7(a).

[158] *See* 42 U.S.C. § 4014(a)(2). These subsidized rates are referred to as "chargeable rates." *See* 44 C.F.R. § 61.7(b). Chargeable rates were deemed necessary to induce community participation in the NFIP. *See* 42 U.S.C. § 4015(a)–(c) (authorizing use of chargeable premium rates "consistent with the objective of making flood insurance available where necessary at reasonable rates so as to encourage prospective insureds to purchase such insurance"); *see also* 42 U.S.C. § 4014(a)(2) (same).

[159] *See, e.g.*, HIGHER GROUND, *supra* note 35, at 57 ("FEMA has operated the NFIP on

quently, approximately thirty percent of all structures insured under the current NFIP pay subsidized rates.[160] In some cases, the subsidy is substantial. Some repetitive loss structures would pay over ten percent of the insured value in annual premiums if insured at actuarial rates.[161]

Even if FEMA eliminated subsidized rates for pre-FIRM construction, the NFIP still would provide substantial direct givings because even its actuarial rates are likely to be below what the private market could charge as a result of built-in programmatic advantages associated with government-backed insurance.[162] First, the NFIP has the right to borrow directly from the U.S. Treasury to pay claims.[163] Thus, the program need not maintain loss reserves or reinsurance comparable to those that would be required by private insurers.

Second, the NFIP can avoid to *some* degree adverse selection and moral hazard problems that would plague private insurers attempting to provide flood insurance. Although recent reforms have increased market penetration of the NFIP to approximately thirty-five percent of structures at risk, the fact that about sixty-five percent of floodplain property owners do not perceive flood risk as worth insuring against indicates a substantial adverse selection problem still exists within the NFIP.[164] The low rate of market penetration strongly suggests that primarily the highest-risk prop-

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the assumption that the Nation's floodplains would be gradually cleared of the higher-risk stock of *pre-FIRM properties* (properties located in the floodplains before FIRMs were drawn), as pre-FIRM buildings, when substantially damaged by floods, would be abandoned, removed from the floodplain completely, or elevated above the 100-year flood level.").

[160] *See* 2001 NFIP FINANCIAL CONDITION REPORT, *supra* note 28, at 6–7 (ratio of pre-FIRM policies to post-FIRM policies has declined to approximately thirty percent of approximately four million policies in force).

[161] *See* HIGHER GROUND, *supra* note 35, at 16 (stating that FEMA charges only $450 to $900 per year in premiums for some coastal areas despite fact that coverage is actually worth $10,000 to $18,000 per year from an actuarial standpoint).

[162] *See* 2001 NFIP FINANCIAL CONDITION REPORT, *supra* note 28, at 8 n.11 ("making all rates actuarially based would not make the program actuarially sound . . . . [I]nitial capitalization would be necessary to establish some reserves in the event that a catastrophic year were to occur before sufficient reserves had accumulated from income from premiums.").

[163] *See* GEN. ACCOUNTING OFFICE, GAOT-RCED-00-23, FLOOD INSURANCE: INFORMATION ON FINANCIAL ASPECTS OF THE NATIONAL FLOOD INSURANCE PROGRAM 5 n.6 (1999) [hereinafter FLOOD INSURANCE] (citing Stanley J. Czerwinski's testimony before the House Subcommittee on Housing and Community Opportunity of the Committee on Banking and Financial Services that FEMA is authorized to borrow up to $1.5 billion from U.S. Treasury to meet claims obligations).

[164] *See* Anderson, *supra* note 46, at 78 ("But today the program [NFIP] is over 30 years old; a 75 to 80 percent noncoverage rate can only indicate that the program has certain endemic flaws."). Since the early 1990s, the number of properties insured under the NFIP has expanded from approximately 2.3 million to over 4 million. *See* FLOOD INSURANCE, *supra* note 163, at 6. But even assuming no increase in the approximately eleven to twelve million structures at risk of flooding (*see supra* note 32 and accompanying text), the recent increases in NFIP policies raise the program's market penetration to only thirty to thirty-five percent.

erty owners opt in and stay in the program.[165] The most obvious aspect of the adverse selection problem lies in the NFIP's repetitive loss properties. Repetitive loss properties account for twenty-five percent of total NFIP losses and forty percent of total NFIP flood insurance payments, but only two percent of the total number of insured properties.[166] Attempts to address the repetitive loss problem routinely have failed in Congress. Two of the most recent legislative sallies—the colorfully named Two Floods and You're Out of the Taxpayer's Pocket Act of 2001[167] and the Repetitive Flood Loss Reduction Act of 2001[168]—foundered in committee. Property rights advocates have lobbied Congress to protect the availability of NFIP insurance at "reasonable" rates that necessarily cannot take account of repetitive losses.[169] Without similar mandatory insurance requirements, it is likely that private insurers would primarily write relatively small pools of insurance policies for owners of high-risk properties.

Third, NFIP premium rates are based upon the "expected losses of an average historical loss year based on experience under the program since 1978."[170] These rates are set below what private insurers could charge for similar coverage because the NFIP has never suffered a catastrophic loss year,[171] meaning that even actuarial premiums based upon the average historical loss year are insufficient to permit the program to build loss re-

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[165] *See* EVATT, *supra* note 5, at 24; *see also* Miller, *supra* note 39, at 186; Anderson, *supra* note 46, at 78; *cf.* George Wyeth, *Regulatory Competition and the Takings Clause*, 91 NW. U. L. REV. 87, 101 n.38 (1996) (observing that if compensation for risk is provided to a landowner, the landowner will ignore the risk, even if such action produces an otherwise economically undesirable result). Tellingly, much of the adverse selection problem may manifest on coastal floodplains—"[a]bout 58.7 percent of policies in force and 62.8 percent of insurance coverage in force pertain to coastal communities . . . . The program is greatly in demand by the owners of recent and opulent development at the ocean's edge." PLATT, *supra* note 96, at 31.

[166] *See, e.g.*, HIGHER GROUND, *supra* note 35, at 57.

[167] H.R. 1428, 107th Cong.

[168] H.R. 1551, 107th Cong.

[169] *See* PLATT, *supra* note 96, at 32; *see also Hearing on Repetitive Loss Properties*, *supra* note 79, at 56 (arguing against imposing penalty on homeowners who refuse mitigation and/or buyout offers following repetitive flood losses); *Odds and Ends: Jefferson Parish Council Actions on Wednesday*, TIMES-PICAYUNE (New Orleans), Aug. 9, 2001, at A4 (reporting on Jefferson Parish Council resolution "asking Louisiana congressional delegation and the Federal Emergency Management Agency to oppose any flood insurance rate increases or proposals to cut off residents who have filed repeated flood claims.").

[170] HIGHER GROUND, *supra* note 35, at 17 (quoting GEN. ACCOUNTING OFFICE, FLOOD INSURANCE: INFORMATION ON VARIOUS ASPECTS OF THE NATIONAL FLOOD INSURANCE PROGRAM, (Testimony before the Subcommittee on Housing and Urban Affairs, Committee on Banking, Housing and Urban Affairs, U.S. Senate (statement of Judy A. England-Joseph, Director, Housing and Community Development Issues; Resources, Community and Economic Development Division) 83 (Sept. 14, 1993)).

[171] A catastrophic loss year would occur when the NFIP suffers approximately $2 billion in losses during any given year. *See* HIGHER GROUND, *supra* note 35, at 17 n.39. *But see* 2001 NFIP FINANCIAL CONDITION REPORT, *supra* note 28, at 7 (defining catastrophic loss year as year in which NFIP suffers $5.5 billion to $6 billion in claims losses). As of 1998, the average historical loss year was defined as approximately $690 million in losses. *See* HIGHER GROUND, *supra* note 35, at 17 n.39.

serves necessary to cover potential losses from a catastrophic loss year, or potentially even a series of years with high successive losses.[172] In contrast, private insurers would necessarily base rate projections not only on historical losses, but also on projected future losses, including the possibility of catastrophic loss years to ensure a large enough reserve to cover infrequent but devastating flood losses.[173]

The clearest indicator that even NFIP actuarial rates are below market value is the lack of private alternatives to NFIP flood insurance. Potentially, the NFIP's programmatic advantages—such as avoiding some adverse selection problems by mandating coverage within 100-year floodplains—may prohibit private competition within areas served by the NFIP.[174] Even in areas where NFIP flood insurance is unavailable, the only reliable source for non-NFIP flood insurance is underwriting groups such as

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[172] *See* HIGHER GROUND, *supra* note 35, at 17; *see also* 2001 NFIP FINANCIAL CONDITION REPORT, *supra* note 28, at 7–8 ("Since [the NFIP's inception], no catastrophic year ($5.5 billion to $6 billion in claims losses) has occurred, and many years in the 1980s were characterized by fairly low actual loss levels as compared to the historical average losses experienced in other years. Therefore, the historical average loss year involves fewer losses from claims than the expected annual claims losses in future years."). "In recent years, the NFIP has remained solvent by using present premiums to pay for past claims. Because of its low rates, the program does not maintain a large cash reserve against a bad claims year as any commercial insurance underwriter does, making it especially vulnerable during a period of high hurricane activity." H.R. REP. NO. 104-452, at 13 (dissenting views of Reps. Miller, Studds, Vento, Pallone, and Kildee).

[173] *Cf. Hearing on Repetitive Loss Properties*, *supra* note 79, at 4 (testimony of Rep. Doug Bereuter) (noting problems for NFIP caused by repetitive loss properties and arguing, "I certainly know of no private insurance company that can long stay in business if it disregards good actuarial practices.").

[174] It is likely that even without these programmatic advantages, private insurers would refuse to enter many coastal floodplain insurance markets. Since Hurricane Andrew caused between $15.5 and $20 billion of insured losses in 1993, many insurers have engaged in "shorelining"—refusing to sell property insurance of any kind within a certain distance of the coast. *See, e.g.*, Maggie Mahar, *Eden for Sale*, BARRONS, July 3, 1995, at 23, 26 ("On the East Coast, private insurers usually don't provide coverage against wind damage within 1,000 feet of the shore. 'If you were willing to pay enough, Lloyd's might write it,' suggests one broker."); Jane Bryant Quinn, *Disasters Have Broad Impact on Homeowners Insurance*, WASH. POST, Mar. 13, 1994, at H3 (noting that insurers responded to high natural disaster insured losses by shorelining—"accepting no business from homeowners within about a mile of a coastline"); Sharon Harvey Rosenberg, *Clouds Over Insurance Reform Plan*, MIAMI DAILY BUS. REV., Sept. 14, 1999, at A1 (discussing difficulty Florida insurance authorities have had convincing property insurers to resume selling property insurance in Florida). After Hurricane Andrew, many insurers refused to sell policies in Florida, prompting Florida to create its own catastrophe fund that would limit insurers' overall liability in the state. *See* Jeff Harrington, *6 Years After Andrew, Insurance Options Return*, ST. PETERSBURG TIMES, June 14, 1998, at 1H. The responses of Florida and other storm-prone states may have convinced some insurers to return to writing policies in those states, but the resumption has not been total. *See* David Sedore, *Owners Finding Home Policies*, PALM BEACH POST, June 3, 1999, at 1D; Nicole Ostrow, *Moratorium on Hurricane Policies Ends*, SUN-SENTINEL (Ft. Lauderdale, Fla.), June 1, 2001, at 1D (discussing stabilization of property insurance market throughout most of Florida); DEAN, *supra* note 40, at 193 (describing withdrawal of insurance companies from writing policies in coastal areas).

Lloyd's of London that specialize in small, uncertain risk pools.[175] The actual amount of the subsidy between the actuarial rates and the rates that a private insurance market would charge likely cannot be determined, however, with any degree of certainty. One study did find that residents in a Coastal Barrier Resource Act ("CBRA") unit[176] near North Bethany Beach, Delaware, paid on average $6.38 per $1,000 of private insurance coverage, while residents of the non-CBRA portion of the community paid only $3.54 per $1,000 of NFIP coverage.[177]

Finally, the NFIP lacks accurate predictive mechanisms to set actuarial rates, which would insure against a degree of risk that is both unknown and likely larger than estimated. This is especially true in light of rising flood risks generated by climate change, sea level rise, and waxing hurricane cycles. Much of this inaccuracy derives from the fact that NFIP rates are established by a political and administrative process subject to influence not by market forces—which would tend to eliminate actuarially unsound rates[178]—but by political forces and special interests:

> Nominally, [FEMA] has discretion over its premiums. In reality, it is politically blocked from using those premiums to deter settlement. It cannot appeal to the principle of actuarial soundness because it was created to cover untenable risks . . . . It is a product of one-sided interest politics, in which one powerful claim is neither checked nor balanced by opposing forces.[179]

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[175] *See* EVATT, *supra* note 5, at 24 (noting that some coastal floodplain owners may find it reasonable to self-insure or insure through private insurers because of the high rental rates they can charge for their properties) (citing Miller, *supra* note 39, at 186); Chris Kidder, *Buying a Home? You Need Flood Insurance*, VIRGINIAN PILOT & LEDGER-STAR, May 31, 1998, at Y6 (noting that while "limited, private coverage for flooding is available in [CBRA] areas, companies in that market 'come and go'").

[176] Areas covered by the CBRA are ineligible for federal flood insurance. *See infra* notes 190–196 and accompanying text.

[177] *See* Heather Colleen Daniel, The Coastal Barrier Resources Act: Impact on Development in the Coastal Zone 40 (2000) (unpublished Master's thesis, University of Delaware) (on file with the Harvard Environmental Law Review). Although the lower NFIP rates shown in this study included some pre-FIRM subsidized rates, the fact remains that NFIP rates, on average, are substantially subsidized versus the market rates for private insurance.

[178] *See* Anderson, *supra* note 46, at 81 ("You can manipulate any system, but it is much easier to manipulate a public insurance system than a private insurance system.").

[179] Siffin, *supra* note 5, at 298; *see also* James Bovard, *More Flood Damage, Courtesy of FEMA?*, WASH. TIMES, July 10, 1997, at A13:

> [B]ut, according to one agency analyst: 'the way they advertise the flood insurance is disgusting. It is a Ponzi scheme—and they have to replenish that sucker because it is running dry. The NFIP is amazingly generous. You are talking of up to $250,000 for property damage coverage for only $300 a year for people living in a flood zone—that is absurd.' Private insurance companies in some cases would charge a $10,000 annual premium for an insurance policy FEMA gives away for a few hundred dollars a year.

As a consequence of the relatively affluent special interests in coastal floodplains, attempts to reform the NFIP rate structure and repetitive loss provisions usually fail to have significant impacts. And—especially in the case of repetitive loss provisions—even where statutory and regulatory provisions clearly require removal of the repetitive loss structure from the insurance pool, local program officials have in the past often failed to enforce these requirements.[180] Because of the political pressures on the system, rate structures remain favorable to both the subsidized and the actuarial insureds within the NFIP, and provisions designed to reduce total insurance exposure over time are not enforced.

Beyond the actuarial inaccuracies introduced by political pressures, the NFIP suffers from substantial difficulties in predicting the actual rate of occurrence for major flood events. Premium rates are established according to FIRMs that delineate the area within each floodplain community subject to a risk of flooding from a 100-year flood, but the FIRMs themselves are based only on systematic historical records from the last fifty years, plus another fifty years of non-systematic or anecdotal data.[181] In other words, the statistics on the rate of occurrence of "100-year floods" are based upon a sample set of a single 100-year period. The NFIP itself "has never weathered a severe storm cycle,"[182] making it likely that its rates underestimate actuarial flood risks. Additionally, although some effort has been made to assess the impact of sea level rise on the NFIP,[183] the actual impact of climate change, sea level rise, and increased cycles of hurricane activity on flood risks is unquantifiable until such changes actually occur.

C. Floodplain Land Use Management: The Coastal Barrier Resources System

The best means of limiting flood damages to human development is to keep the development away from high-risk areas. Floodplain land use management seeks to maximize the total utility of floodplains while mini-

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[180] *See* Anderson, *supra* note 46, at 81 ("It is clear that for these [repetitive loss] properties that relocation or elevation has not occurred" as required by the NFIP after the properties suffer substantial damage in a flood event); *see also* HIGHER GROUND, *supra* note 35, at 57–58 (noting lack of enforcement of NFIP requirements that properties suffering substantial damages from flooding be relocated or destroyed). Much of the lack of enforcement of NFIP requirements for building codes and moving or demolishing substantially damaged structures by local and state officials may arise from the fact that efforts at enforcement by states vary dramatically. Florida, with over two million structures in special flood hazard areas, has only six state employees monitoring compliance with floodplain regulations. *See* EVATT, *supra* note 5, at 31. Likewise, Texas, with over one million at-risk structures and a high percentage of total repetitive loss properties, allocates only $50,000 to floodplain regulation enforcement. *See id.*

[181] *See supra* notes 75–78 and accompanying text.

[182] *See* Poirier, *supra* note 48, at 312.

[183] *See generally* FEDERAL EMERGENCY MANAGEMENT AGENCY, PROJECTED IMPACT OF RELATIVE SEA LEVEL RISE ON THE NATIONAL FLOOD INSURANCE PROGRAM (1991).

mizing the risk of losses by adjusting human uses of floodplains.[184] Floodplain land use management may also attempt to preserve the ecologic values of leaving floodplains undeveloped, thereby increasing both the economic and environmental benefits of floodplain use.[185]

Unlike other governmental responses to flooding, land use management systems are proactive and forward-looking responses to flooding. Land use planning should be an ex ante, non-crisis-based decision-making process, ideally based upon careful deliberations by experts. Land use planners must look not only to the uses currently occupying floodplains, but also to how future uses may affect present floodplain occupation.[186] In so doing, planners can anticipate future floodplain changes and incorporate flexible responses to flood-induced changes.

While the land use planning process holds great promise for managing human uses of floodplains, the process still is subject to disadvantages that have rendered it largely ineffective at reducing flood risks. First, floodplain land use management is a redistributive mechanism, prohibiting floodplain land uses that, if costs of flooding were externalized, would maximize the property's value.[187] Consequently, floodplain property owners have strong economic incentives to oppose restrictions on floodplain property use.

Second, land use management is a strategy best employed before floodplain development has occurred. After the development is in place, land use management programs must incur the additional costs of removing that development, either by shifting those costs onto property owners who have invested in improvements with the expectation of rents or returns or by compensating those property owners if subsequent use restrictions constitute a Fifth Amendment taking. Additionally, land use management traditionally has not been employed as a tool for floodplain management until the need for it becomes pressing:

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[184] *See* BURBY & FRENCH, *supra* note 108, at 5 ("Increasingly, however, attention is shifting toward the third strategy for coping with flood hazards—reducing the susceptibility to flood damage by keeping people and property away from flood-prone areas (the land use management approach)."); *see also* WHITE, *supra* note 4, at 17–21. The goals of floodplain land use management are to (1) reduce flood-related deaths, (2) reduce actual flood losses, and (3) reduce the loss of natural and cultural resources in floodplains. *See* ASSESSMENT REPORT, *supra* note 3, at 4. Notably, the report of the Federal Interagency Floodplain Management Task Force describes these three goals with the apparently implicit assumption that some human use of floodplains is unavoidable, and possibly desirable.

[185] *See, e.g.*, PHILIPPI, *supra* note 33, at 95 (describing relatively recent inclusion of environmental protection as goal of floodplain land use management).

[186] *See, e.g.*, WHITE, *supra* note 4, at 19–21.

[187] *See, e.g.*, Pierre Ouellette et al., *Cost-Benefit Analysis of Flood Plain Zoning*, J. WATER RESOURCES PLAN. & MGMT., May 1988, at 326:

> While the [floodplain zoning program] is cost-effective for all parties of the society, it is redistributive. Landowners are the main beneficiaries, while the benefit-cost ratio for governments is consistently less than 1. Owing, however, to market imperfections, landowners gain no advantage from promoting such programs. This is an explanation why such programs are not more widely implemented.

> At this point the land use management paradox facing planners and policy makers should be apparent. Communities often do not become concerned with flood plain land use management and do not begin to adopt vigorous management programs until after they have created a problem by allowing flood plain invasion. However, once extensive (and intensive) development of the flood plain has occurred, land use management may not be the appropriate management approach.[188]

Additionally, local governments historically have zealously guarded local control over land use. But floodplains, coastlines, and watersheds often span two or more states and multiple localities. The multi-jurisdictional nature of floodplains can create a patchwork approach to land use within floodplains. Measures to protect coastal floodplains upward of the littoral drift may have dramatic consequences downdrift. For example, jetties designed to trap sand for beaches updrift of the littoral flow along the coastlines deprive downdrift beaches of sand, increasing the rate of erosion along those downdrift beaches.[189] Without some larger land use management unit, local approaches to floodplain management may be counteracted by upstream or updrift uses.

The federal CBRA[190] has achieved limited success at floodplain land use management. The CBRA assumes that market forces, absent government intervention, would not support development on the unstable coastal barriers.[191] Coastal barriers are "sediment-composed landforms—islands, spits, bay mouth barriers, and wetlands—lining much of the perimeter of the continent and the shores of the Great Lakes."[192] These landforms are the first line of defense against storm surge and flooding and exist in a dynamic and constantly mobile state, a mobility that is destroyed by human construction.[193] The CBRA designates undeveloped coastal barriers for inclusion in the Coastal Barrier Resource System ("CBRS")[194] and then denies federal funds for new construction for any area within the system.[195] The CBRA specifically denies direct federal grants

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[188] Burby & French, *supra* note 30, at 294–95.

[189] *See* MANAGING COASTAL EROSION, *supra* note 66, at 29 (explaining that the effects of jetties, inlets, and dredged entrances "can extend for miles from the entrance").

[190] 16 U.S.C. §§ 3501–3510 (2000).

[191] *See id.* § 3501; *see also* Jones, *supra* note 67, at 1017; PLATT, *supra* note 96, at 80–81 (saying that CBRA represents Congress' acceptance of proposition that "flood insurance and other federal incentives were inducing development in hazardous and ecologically fragile coastal barriers . . .").

[192] Jones, *supra* note 67, at 1018. The best-known example of coastal barrier landforms in the United States is the 2700-mile-long chain of 400 barrier islands along the Atlantic and Gulf coasts. *Id.* at 1019.

[193] *See id.* at 1022–23.

[194] *See* 16 U.S.C. §§ 3502–3503. Currently, the CBRS contains almost 200 units that protect almost half a million acres of coastal barrier landforms. *See* MANAGING COASTAL EROSION, *supra* note 66, at 56; Jones, *supra* note 77, at 1037.

[195] *See* 16 U.S.C. § 3504 (2000); *see also* MANAGING COASTAL EROSION, *supra* note 66, at 56.

for infrastructure improvements, coastal protection projects, and NFIP insurance for any new construction.[196]

The CBRA has had only limited success in preventing coastal barrier island development. A 1992 General Accounting Office study determined that while the CBRA's prohibitions on federal expenditures within the CBRS had discouraged some development on some coastal barrier islands, the Act had not prevented development on other attractive or accessible barrier islands.[197] The continued development of coastal barrier islands highlights the conclusion that merely denying federal subsidies to coastal floodplains would not prevent their development. Rather, especially in the case of barrier islands, property owners may find it profitable to incur occasional flood damages in exchange for the high rental returns possible from desirable beachfront properties.[198]

Further, federal agencies occasionally have failed to comply with the Act's prohibition against federal expenditures within the CBRA, potentially promoting new development within the CBRS.[199] And agencies are not required to comply with the requirements of the CBRA, nor is agency compliance adequately monitored.[200] Despite amendments in 1990 that nearly tripled the area protected within the CBRS, the CBRS still covers an area that is inadequate to protect coastal barrier resources.[201] Finally, the CBRA has little impact upon existing development—the Act applies to undeveloped barrier islands designated within the CBRS, and cannot affect the removal of structures and development from high-risk floodplains.

Despite its shortcomings, the CBRA is important because it demonstrates that the federal role in floodplain land use management can be effective in reducing the incentives to develop floodplains. Although development will continue in some areas without positive disincentives or even outright prohibitions, reductions in federal infrastructure subsidization and other givings may in turn reduce the burden on government entities attempting to remove existing development from high-risk areas through land acquisition programs in the future.

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[196] 16 U.S.C. § 3504; *see also* 42 U.S.C. § 4028 (2000) (prohibiting federally insured financial institutions from making loans to fund any new construction or substantial improvements to properties within the CBRS).

[197] *See* GEN. ACCOUNTING OFFICE, COASTAL BARRIERS: DEVELOPMENT OCCURRING DESPITE PROHIBITIONS AGAINST FEDERAL ASSISTANCE 17–21 (1992) [hereinafter DEVELOPMENT OCCURRING DESPITE PROHIBITIONS] (discussing successes and failures of CBRA in preventing development within CBRS).

[198] *See* EVATT, *supra* note 5, at 24.

[199] *See* DEVELOPMENT OCCURRING DESPITE PROHIBITIONS, *supra* note 197, at 26 (reporting that FEMA has erroneously written flood insurance policies for properties within the CBRS).

[200] For example, the Department of Transportation has three times ignored the determination by the Department of the Interior that reconstruction of Highway 87 in Texas would violate the terms of the CBRA. *See* Jones, *supra* note 67, at 1041–42. Similarly, following Hurricanes Bertha and Fran, approximately $4 million of federal funds is reported to have been spent on development on the CBRS portion of Topsail Island, North Carolina. *See* Greg Jaffe & Motoko Rich, *To the Rescue—Building in Waves: Mere Hurricanes Won't Stop This Barrier Island*, WALL ST. J., Aug. 31, 1998, at A1.

[201] Jones, *supra* note 67, at 1048.

Additionally, the CBRA provides a model under which the federal government can engage in "environmental zoning." Specifically, a programmatic response to facilitate a retreat from high-risk floodplains must be sufficiently flexible to recognize both those floodplains of such environmental value or high risk that no development could exist therein without externalizing its costs, and those floodplains in which some uses would be economically beneficial and at least not environmentally harmful.

V. A Strategy for Floodplain Preservation: Property Acquisition Through Recapturing Past Givings

Current government approaches to flood risk have failed to reduce losses from floods. As a result of substantial givings, government policies have increased the value of floodplain development, and therefore the scale of flood damages. Rather than make an orderly retreat from high-risk coastal floodplains, property owners, developers, and government entities have rushed into those areas, building to greater densities than ever before. The problem is produced by several key factors. First, coastal floodplain property owners do not have to capitalize the full costs of their decisions to live on the coast. Rather, their ability to externalize a portion of the cost of floodplain development, through higher rents, subsidized insurance, beach armoring and nourishment, or other means, allows economically inefficient and unsustainable coastal development to flourish. Second, the ability to externalize the true costs of coastal floodplain development increases floodplain property values, which in turn draws wealthier property owners who are better able to fund political resistance against floodplain land use restrictions. Third, higher coastal floodplain property values also restrict the ability of governments to limit the uses to which such properties may be put through regulation[202] or public acquisition of those properties.[203]

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[202] Specifically, as property values increase, government actions that restrict use of those properties will cause progressively greater economic impacts on affected landowners. *See, e.g.*, Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency, 535 U.S. 302, 315 n.10 (2002) (absent categorical per se taking, court must apply ad hoc *Penn Central* balancing test involving "a complex of factors including the regulation's economic effect on the landowner, the extent to which the regulation interferes with reasonable investment-backed expectations, and the character of the government action") (quoting Palazzolo v. Rhode Island, 533 U.S. 606, 617 (2001)). As property values increase, governments must incur the full costs of those increases in the event that a regulation is found to constitute a categorical taking under *Lucas*. And while the direct impacts of categorical takings will be rare, *see Tahoe-Sierra*, 535 U.S. at 332 ("the categorical rule in *Lucas* was carved out for the 'extraordinary case' in which a regulation permanently deprives property of all value"), even under the three-pronged *Penn Central* analysis, increases in property values will indirectly increase the likelihood of a taking by increasing the economic burden of regulatory actions on affected landowners.

[203] Higher property values also increase incentives for local governments to permit floodplain development to the maximum extent possible to maximize their tax base. *See supra* note 56 and accompanying text.

Every major flood event identifies areas within the floodplain where the costs of repairing and rebuilding flood-damaged development outweigh the economic benefits of that development, but risk and cost allocation mechanisms such as disaster relief and flood insurance do not use flood damages as indicators of where to pull development back from floodplains. Instead, the "remedy" of choice is to continue funding repairs and reconstruction of new structures in the same locations under the same risk of loss calculations. And even in areas where federal givings are largely prohibited, such as the CBRS, political and economic pressures continue to press for reopening those floodplains for development because they expect to have the costs of their beachfront development externalized at least in part to taxpayers.

The result is that current government responses to flooding cut against apparently rational individual behavior. Landowners, developers, and local governments have expanded floodplain development and redevelopment, heightened risks of flooding and expanded flood losses caused by greater floodplain urbanization, and increased taxpayer exposure to fund this cycle of repair and reconstruction. Increased coastal floodplain investment by government and individuals in turn reinforces the perception that government will support such development in perpetuity. Examined more closely, however, the primary actors responsible for development—property owners and local governments—are behaving in an entirely rational way. Unless the rules of the game change, the coastlines will be consumed, and disaster costs will rise to unanticipated levels.

The current approach to floodplain management is unsustainable. To avoid continued and growing flood losses in the future, the federal government must adopt a fundamentally different policy toward floodplain management. That policy must, at a minimum, adopt three significant changes from current approaches:

- First, government must increase its emphasis on public acquisition of floodplain property;
- Second, government must recognize and compensate landowners for legitimate, investment-backed expectations while avoiding compensating landowners for governmental givings attributable to past government flood responses;
- Third, property acquisition programs must focus upon a broad federal program aimed at high-risk or environmentally valuable floodplain properties.

A. Increasing Emphasis on Public Acquisition of Property Rights Taking Coastal Floodplains Out of Circulation

Many experts and commentators have recommended a host of land use management tools and reforms either to prevent new floodplain development or to roll back development from the coasts. Of all of the proposed reforms, only property acquisition has proven truly effective at removing existing floodplain development and preventing new development from taking its place.

1. Overview of Potential Floodplain Land Use Management Approaches

Proposed reforms to current policy usually fall into several categories. First, many recommendations focus upon immediate restrictions or prohibitions on floodplain development. As early as 1945, Gilbert White advocated land use restrictions such as zoning, public subsidy of property abandonment, and public acquisition of land to "curb unsound urban occupance of undeveloped land."[204] More recently, Raymond Burby and Steven French have recommended a combination of police power regulations (e.g., floodplain zoning, subdivision regulations, flood-proofing building codes, sanitary codes, and transfer-of-development-rights programs), capital improvement programs to locate public infrastructure out of floodplains, public acquisition of flood-prone properties, relocation of improvements on flood-prone properties, higher tax rates on floodplain development, actuarial rates for properties insured under the NFIP, watershed-based regulations to limit the effect of urban development on flooding, and education of the public about flood risks.[205]

Second, legislators and other federal budget hawks perennially call for limitations on federal expenditures that subsidize and support floodplain development.[206] The proposed Two Floods and You Are Out of the Taxpayers' Pocket Act of 2001, for instance, would deny any federal disaster aid to property owners making repetitive claims under the NFIP that refuse mitigation aid to prevent future flood losses.[207] Elimination of subsidies to floodplain development may involve prohibitions on all expenditures of federal funds within high-risk floodplains (as with the CBRA)[208] or limitations on the ability of some class of floodplain property owners,

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[204] White, *supra* note 4, at 19.

[205] *See* BURBY & FRENCH, *supra* note 108, at 36–42.

[206] Numerous state programs also purport to limit expenditures of state funds within designated coastal areas. For an overview of state programs restricting public subsidies to high-risk coastal areas, see generally GODSCHALK, *supra* note 52, at 39–58.

[207] H.R. 1428, 107th Cong. (2001).

[208] *See supra* notes 190–201.

such as owners of repetitive loss properties, to continue receiving some government subsidies.

Third, recent reform efforts have focused on more direct approaches to preventing the principal actors—floodplain property owners and local governments—from permitting and maintaining development in hazardous floodplains. James Titus of the U.S. Environmental Protection Agency, for example, has recommended the purchase of rolling conservation easements on coastal properties to prohibit flood control structures[209] such as seawalls and other hard armoring that would prevent coastal wetlands from migrating inland with sea level rise.[210] Another commentator has recommended holding local governments that knowingly or negligently permit development in high-risk floodplains liable for flood-related damages caused by their permitting decisions.[211]

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[209] *See* James G. Titus, *Does the U.S. Government Realize that the Sea is Rising? How to Restructure Federal Programs so that Wetlands and Beaches Survive*, 30 GOLDEN GATE U. L. REV. 717, 737–39 (2000) (discussing merits of rolling conservation easements); *Titus, supra* note 7, at 1308–18 (discussing costs and benefits of rolling easements, development prohibitions, and deferring action as possible actions to preserve coastal wetlands from rising sea levels); *see also* Lisa A. St. Armand, *supra* note 7, at 18–24 (discussing reservations of use and occupancy, buyouts required for substantially damaged structures insured under the NFIP, and private land trusts as possible tools for reducing coastal floodplain development). Specifically, both Titus and St. Amand recommend creating a presumption that coastal property owners have no right to hold back encroaching seas. For Titus, the government should purchase or legislatively reserve for itself property interests, called rolling easements—"a broad collection of arrangements under which human activities are required to yield the right of way to naturally migrating shores." Titus, *supra* note 7, at 1313. These rolling easements involve government condemnation (or legislative reservation) of options to purchase, easements, restrictive covenants, or similar property interests under which government could prohibit the construction of coastal armoring structures that would otherwise block rising sea levels from permanently inundating coastal landowners' property. *See id.* The end result of Titus's proposal would be to permit coastal wetlands to migrate inland with rising sea levels, pushing "the boundary between publicly owned tidelands and privately owned dryland . . . inland to the natural high water mark, whether or not human activities artificially prevent the water from intruding." *Id.* St. Amand likewise recommends "institutionalizing the presumption that humanly constructed structures will have to give way to migrating wetlands as sea level rises." St. Amand, *supra* note 7, at 3. Although St. Amand analyzes a wide array of potential options for institutionalizing the presumption of wetland migration, I will refer to her and Titus's recommendations collectively as "rolling easements."

[210] Titus's proposed solution focuses on preventing the loss of coastal wetlands along estuarine bay-front properties, which are less susceptible to catastrophic erosion because of their relatively protected locations away from direct frontage on the ocean. *See* Titus, *supra* note 7, at 1298–1302. Because of the lack of catastrophic erosion, estuarine bay-front properties can be preserved against rising sea levels with hard armoring that is inexpensive, effective, and permanent relative to similar structures to protect ocean beachfront properties. *See id.* Although the hard armoring will likely prevent inundation of property behind such structures, those same structures will prevent coastal wetlands and estuaries from migrating inland with sea level rise. *See id.* Consequently, Titus's rolling easement proposal may be particularly effective in preserving environmentally sensitive coastal wetlands where preserving development in place against rising sea levels is nonetheless economically efficient for affected landowners.

[211] *See* City, *supra* note 56, at 1539–40.

More recently, both FEMA and numerous commentators have agreed that floodplain management policy must focus more on moving existing high-risk development out of floodplains while preventing new development from moving in. Recent FEMA reports specifically address the net benefits of moving properties at high-risk of flood damage that are insured under the NFIP out of the floodplain to higher ground.[212] Similarly, the National Wildlife Federation, in its influential 1999 report, *Higher Ground*, on voluntary buyouts of repetitive loss properties argues that federal flood control projects, disaster assistance, and flood insurance have created incentives for floodplain development that will suffer disastrous losses unless it is removed from high-risk or environmentally sensitive floodplains.[213]

2. Limitations of Land Use Management on Coastal Floodplains

These proposed floodplain management policies and reforms—indeed, virtually all approaches to floodplain management—suffer to varying extents from three common problems: inflexibility in the face of uncertainty, high costs of implementation, and lack of political will to overcome established interests of current and future floodplain property owners. First, most government-mandated limitations on floodplain development are inflexible and imprecise, leading to economically inefficient allocations of floodplain resources. Not all floodplain development—even in the highest-risk areas—is economically inefficient. Rather, any given development may be economically beneficial, economically detrimental (i.e., either the value of the development does not exceed the internalized or externalized costs of that development, or the value of the development was positive at some point in the past but through technological or environmental changes is no longer positive), or economically neutral.[214] Moreo-

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[212] *See, e.g.*, FEMA, FEDERAL EMERGENCY MANAGEMENT AGENCY ACCOUNTABILITY REPORT FOR FISCAL YEAR 2000, at 28–32 (2001) [hereinafter FY 2000 ACCOUNTABILITY REPORT] (discussing Repetitive Loss Initiative designed to mitigate cost of repetitive insurance payments for structures suffering multiple instances of flood damage and Hazard Mitigation Grant Program designed to minimize disaster assistance costs by, among other things, acquiring and relocating real property and improvements and elevating improvements located in floodplains); 2001 NFIP FINANCIAL CONDITION REPORT, *supra* note 28, at 10 (describing implementation of Repetitive Loss Initiative targeting 10,000 worst repetitive loss properties for purchase or remediation).

[213] *See* HIGHER GROUND, *supra* note 35, at 125–29 (identifying major problems with federal floodplain management policy and recommending increased use of voluntary property buyouts and other nonstructural approaches to flood control to remove improvements from high-risk floodplains); *see also* BURBY & FRENCH, *supra* note 108, at 21-22 (discussing drawbacks of land use management approaches focusing on building codes that purport to "flood proof" structures through elevation and other site-specific techniques, rather than preventing development in high-risk floodplains); PLATT, *supra* note 96, at 69–72 (noting growing acceptance of nonstructural flood hazard mitigation efforts by federal government); White, *supra* note 4, at 19 (advocating land use readjustment for non-floodplain-dependent agricultural uses and "unsound urban occupance of undeveloped land").

[214] *See* White, *supra* note 4, at 20–21 (discussing need for flexibility in assessing economic validity of different types of floodplain development).

ver, the economic benefits of any particular unit of floodplain development will change in relation to new development elsewhere in the floodplain, changing weather patterns and climate, and changes in society's tastes and preferences.

Ideally, floodplain management would not only permit economically beneficial floodplain development, but also accurately identify and remove or prevent economically detrimental development. Such determinations are better suited to market-based mechanisms, which can react to changing conditions and needs on the scale of individual parcels. No a priori bureaucratic determination to remove or prevent development in defined floodplain areas can accurately reflect the dynamic nature of this environment and any such restrictions will necessarily over- or undercompensate for such unforeseen and unknowable risks.[215]

Notably, and in contrast to direct prohibitions on future floodplain development and proposals to limit or deny givings to floodplain owners altogether, rolling easements and voluntary buyouts largely avoid this inflexibility. Voluntary buyouts depend on determinations by individual floodplain property owners that the costs of continuing to live in a floodplain outweigh the benefits of selling, elevating or relocating their structures.[216] Although this decision can be distorted by the continued availability of government givings, it promotes flexibility by granting control over that decision to landowners, who are in the best position to weigh the costs of remaining in the floodplain. Rolling easements similarly promote flexible land use choice by allowing nature to take its course with respect to sea level rise and inland migration of coastal wetlands and forcing landowners to incorporate into individual land use decisions the risk that their properties will suffer inundation.[217] In addition to purely financial calculations, both rolling easements and voluntary buyouts institutionalize the recognition that individual property owners have subjective and purely personal values invested in their properties that cannot (and would not) be compensated with a monetary award.

Second, reforms prohibiting floodplain development may impose substantial short-term costs upon the government entity seeking to impose those controls or upon the individual landowner subjected to new floodplain management controls. Any regulation limiting the uses to which floodplain

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[215] *See, e.g.*, Titus, *supra* note 7, at 1327 (noting that limitation of a priori government determinations of where to prohibit coastal development "prevent either too much or too little development" in the face of uncertainty as to scope of future sea level rise and erosion); SHARING THE CHALLENGE, *supra* note 75, at 59 (describing substantial errors in maps of 100-year floodplains).

[216] *See* HIGHER GROUND, *supra* note 35, at 35 ("[B]uyouts involve intensely personal issues, such as leaving a home.").

[217] *See* Titus, *supra* note 7, at 1322 ("If a property owner wants to build in spite of the knowledge that the house will have to be abandoned a few decades hence, her reason may be that the rental value of a bayfront house—even for a short period of time—exceeds the cost of the structure.").

property may be put necessarily lowers the value of that property. Where floodplain land use restrictions diminish only a part of a property's value and do not unreasonably interfere with the property owner's investment-backed expectations, the property owner generally must bear the cost of the restriction in the form of reduced property values.[218] And regulations that go "too far"[219] in limiting the uses to which an owner may put his or her property—either by unreasonably interfering with investment-backed expectations or by prohibiting all economically beneficial uses of the property[220]—will require that the entity promulgating such regulations pay just compensation for the injury to property rights under the Fifth Amendment. Even if courts ultimately determine that any given regulatory restriction does not rise to the level of a taking, restrictions that impose higher burdens on property owners will necessarily give rise to greater amounts of litigation challenging those restrictions and impose litigation costs on all parties. In each of these situations, land use restrictions—especially on the large scale necessary to remove existing development from high-risk or environmentally sensitive floodplains—impose clear, immediate costs that exceed the year-to-year costs of responding to flood disasters piecemeal.

Likewise, limitations on the availability of government subsidies to certain classes of floodplain properties can have unintended consequences that may actually increase government costs. For example, proposals to eliminate subsidized rates and require all pre-FIRM properties to pay actuarial rates under the NFIP likely would cause many owners of pre-FIRM properties to cancel their flood insurance policies and place greater burdens on federal disaster relief.[221]

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[218] *See, e.g.*, Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency, 535 U.S. 302, 335–43 (2002) (holding that absent categorical prohibiting of all economically beneficial use of property burdened by regulation, court must balance economic impact of regulation, interference with landowner's reasonable investment-backed expectations, and character of government action with respect to parcel as a whole to determine existence of valid takings claim); Penn Cent. Transp. Co. v. New York City, 438 U.S. 104, 124 (1978) (identifying three principle factors—economic impact of the regulation, extent regulation interferes with investment-backed expectations, and character of government action—as focus of regulatory taking analysis and holding use restrictions of airspace above historic landmark did not constitute taking); Esposito v. South Carolina, 939 F.2d 165, 170 (4th Cir. 1991) (holding that coastal setback restrictions that did not deprive coastal floodplain owner of any current uses of property and only limited right to rebuild in event property was destroyed reduced market value of property but did not constitute taking).

[219] Pa. Coal Co. v. Mahon, 260 U.S. 393, 415 (1922) ("The general rule at least is that while property may be regulated to a certain extent, if a regulation goes too far it will be recognized as a taking.").

[220] *See Tahoe-Sierra*, 535 U.S. at 335–43; *Penn Central*, 438 U.S. at 124; *see also* Palazzolo v. Rhode Island, 533 U.S. 606, 617–18 (2001); *Lucas*, 505 U.S. at 1019.

[221] *See Hearing on Repetitive Loss Properties*, *supra* note 79, at 58 (prepared statement of Rep. Richard H. Baker arguing that an increase in premiums would drive property owners away from NFIP, diminishing amount by which NFIP premiums would offset future disaster relief); HIGHER GROUND, *supra* note 35, at 16–17 (charging actuarial rates to pre-FIRM properties—on average raising premiums threefold—"would force many of those

Third, political realities dictate that floodplain property owners will continue to manipulate the political system to promote and support floodplain development. Floodplain property owners, especially in coastal floodplains most likely to be severely affected by global warming, sea level rise, and changing weather patterns, are disproportionately wealthy.[222] Consequently, as a group coastal floodplain property owners are able to overcome barriers to political action and more easily fund lobbying efforts to prevent restrictions on uses of their floodplain properties.[223] Additionally, floodplain property owners are an easily identifiable and discrete interest group with substantial incentives to maintain any protections for their property.[224] And the subsidies to floodplain landowners are concrete and substantial, measurable as a significant dollar amount in terms of higher property values, perceived reductions in flood risks, and avoided insurance premiums that the private insurance market would otherwise charge, if private flood insurance were even available.[225] These attributes make floodplain landowners a powerful lobby, even in light of occasional public outcry over the inequity of continuing to subsidize the lifestyle choices of floodplain property owners with tax dollars. As one commentator observed, "[i]f public choice theory has one key finding, it is that small groups with high stakes have a disproportionately great influence on the political process."[226]

In contrast, upland property owners have little incentive to organize sufficiently to overcome the floodplain owners.[227] The general public lacks the means to overcome obstacles to political action as well as the concrete financial incentives to do so:

> [T]he main obstacle to the elimination of perverse incentives is that the social and economic benefits of doing so are broad-based and diffuse, whereas the loss is concentrated on a few private actors who often have considerable political influence. Thus, elimination of perverse incentives will require educating a wide range

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now paying the subsidized premiums to drop the insurance, thereby increasing the chance they would require federal disaster assistance after a flood.").

[222] *See* Anderson, *supra* note 46, at 76.

[223] *See* FRANK J. POPPER, THE POLITICS OF LAND-USE REFORM 122–23 (1981) (discussing need for continuous public involvement in land use planning and management agency decision-making to avoid agency capture by regulated entities).

[224] *See supra* note 17 and accompanying text.

[225] *Mitigation and Cost Reduction Act of 1998: Hearing Before the House Subcommittee on Water Resources and Environment of the Committee on Transportation and Infrastructure*, 105th Cong. 16 (1998) (statement of Rep. Gene Taylor) "[I]f you are going to count on us to insure your property, which we do—and in most cases we do because no private sector insurer will do it—then, like any private sector insurer, we're going to take some steps to minimize the potential for losses.").

[226] Daniel A. Farber, *Economic Analysis and Just Compensation*, 12 INT'L REV. L. & ECON. 125, 130 (1992) (describing incentives of community landowners to resist government takings by seeking compensation).

[227] *See* Levmore, *supra* note 39, at 3–18.

> of stakeholders on the benefits of conservation as well as the fiscal drawbacks of perverse incentives.[228]

Once floodplain development has occurred, upland taxpayers face an uphill battle to place restrictions on the flow of subsidies to floodplain residents.[229] And even if upland taxpayers do manage temporarily to overcome the public choice problem, it is likely that as soon as pressure for reform relaxes, floodplain property owners will again increase the flow of subsidies to their development.

Thus, coastal floodplain property owners constitute a focused, well-funded special interest group with substantial political influence. "Where developed beachfront property is concerned, interest group pressures will systematically create a subsidy flowing towards beachfront property owners and dwellers."[230] Not surprisingly, then, reform measures, such as premium increases,[231] elimination of subsidized rates for pre-FIRM properties,[232] and denial of continued insurance for some insureds making large or repetitive claims against the NFIP[233] have all met with political resistance on behalf of floodplain owners threatened with losing their subsidies.

Perhaps more than any other obstacle, it is the political opposition to meaningful restrictions on coastal land use that limits the effectiveness of attempts to initiate a retreat from coastal floodplains. Professor Marc Poirier describes these obstacles in terms of (1) implementing restrictive legislation in the first place, and (2) keeping that legislation in place following a waning of public interest and a waxing of the political power of affected coastal landowners following some event such as a storm or flood that raises public sympathy for that group.[234] The South Carolina Beach-

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[228] Ian Bowles et al., *Economic Incentives and Legal Tools for Private Sector Conservation*, 8 DUKE ENVTL. L. & POL'Y F. 209, 238 (1998).

[229] *See* Poirier, *supra* note 48, at 254.

[230] *Id.* at 256.

[231] *See* 42 U.S.C. § 4015(e) (2000) (limiting increases in chargeable premium rates to no more than ten percent per year).

[232] *See Hearing on Repetitive Loss Properties*, *supra* note 79, at 58 (prepared statement of Rep. Richard H. Baker arguing against increases in premium rates for owners of repetitive loss properties that would drive people away from the National Flood Insurance Program).

[233] *See id.* at 6–7 (statement of Rep. Richard H. Baker) (arguing against inequity of withholding flood insurance from innocent owners of repetitive loss properties); *id.* at 22 (statement of Stanley J. Czerwinski) (observing that, despite prohibition against those property owners who were eligible for flood insurance but did not get it receiving repetitive disaster assistance payments, "I don't know of any examples of us denying [disaster] assistance to them.").

[234] *See* Poirier, *supra* note 48, at 256, 268 (analyzing disproportionate political influence of beachfront property owners); *see also* POPPER, *supra* note 223, at 122–23. Titus describes the same phenomenon in terms of "backsliding"—the ability of local interests to reverse or upset regulatory restrictions on coastal land use. *See* Titus, *supra* note 7, at 1331–34 (arguing for regulatory programs that limit possibility of repeal through purchases of rolling easements because "the public can more easily accept relaxation of a regulation than the relinquishment of a public property interest for which the government

front Management Act[235] at issue in *Lucas*, for example, has encountered substantial resistance, and state enforcement of the Act has been limited to some degree by political and judicial action from private property interests.[236] Continued pressure for development of highly desirable beachfront and coastal floodplain properties will tend to defeat or repeal purely regulatory prohibitions on coastal floodplain development and limit or negate the effectiveness of restrictions on government subsidies such as flood insurance, disaster relief, or infrastructure improvements along the coasts.[237]

3. The Potential for Public Acquisition of Floodplain Property To Limit Flood Losses

Of all proposed reforms to current federal floodplain management policy, only public acquisition of floodplain property has achieved meaningful success, measured in terms of permanently removing high-risk structures from floodplains, preventing repetitive disaster assistance and flood insurance payments to floodplain properties, and maintaining the investment-backed expectations of floodplain property owners.[238] Current buyout programs have achieved some success in reducing flood losses.[239] Following the

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has paid.").

[235] S.C. CODE ANN. §§ 48-39-250 to 48-39-360 (Law. Co-op. Supp. 2002).

[236] *See* Ellen P. Hawes, *Coastal Natural Hazards Mitigation: The Erosion of Regulatory Retreat in South Carolina*, 7 S.C. ENVTL. L.J. 55, 70–72, 73–79 (1998) (assessing limitations on South Carolina's attempt to effect regulatory retreat from coastal floodplains caused by judicial recognition of takings issues and development pressures along coast).

[237] *See infra* notes 251–252 and accompanying text (describing continued chipping away of CBRA restrictions by barrier island property owners); *see also* COASTAL HAZARDS MITIGATION, *supra* note 52, at 63–64 (describing costly impact of development within CBRA areas requiring maintenance of infrastructure within high-hazard areas).

[238] *See* HIGHER GROUND, *supra* note 35, at 130–32 (recommending that the federal government emphasize voluntary buyouts of high-risk, repetitive loss floodplain properties and enforce NFIP guidelines requiring elevation or removal of substantially damaged properties); *see also* DEAN, *supra* note 40, at 213 ("There is only one sure way to preserve the coastal landscape from unwise and unsafe development: buy it."); PHILIPPI, *supra* note 33, at 4–5 (concluding that buyouts are the only effective means of managing floodplains to maximize both environmental and economic values).

[239] Buyouts of high-risk floodplain properties, along with other requirements for removal of substantially damaged properties from the floodplain, have achieved only limited acceptance as a flood control measure in the past. For example, the Upton-Jones Act, Pub. L. No. 100-242, § 544, 101 Stat. 1815, 1940–42 (1988), attempted to address problems of beachfront developments facing rising water levels and rapidly eroding shorelines by buying out structures in imminent danger of collapse and destruction caused by flooding. Prior to that act, the NFIP authorized payment only in the event of physical damage caused by erosion or flooding. *See, e.g.*, 42 U.S.C. § 4019 (2000) (authorizing Secretary to prescribe regulations by which actual claims may be adjusted for damage to or loss of property); *id.* § 4053 (authorizing insurance pool to adjust and pay claims for actual losses); *see also* MANAGING COASTAL EROSION, *supra* note 66, at 79. The Upton-Jones Act was a failure—only 266 claims were filed during the first two years, *id.* at 84, and the National Flood Insurance Act was amended in 1994 to eliminate the Upton-Jones program. *See* Pub. L. No. 103-325, § 552, 108 Stat. 2160, 2269 (1994).

1993 Mississippi floods, for example, FEMA engaged in several high-profile buyouts, including moving two entire towns out of the Mississippi floodplain.[240] And pursuant to section 404 of the Stafford Disaster Relief and Emergency Assistance Act ("Stafford Act"), FEMA may use a portion of federal allocations for hazard mitigation to engage in voluntary buyouts of high-risk, repetitive loss properties.[241] This has increased use of property acquisition as a flood hazard mitigation technique.[242]

Floodplain management experts and academics have, in the last decade, begun to emphasize the benefits of land acquisition over other flood control or risk allocation responses. Much of this attention to land acquisition in the floodplain management context comes from the National Wildlife Federation's 1998 *Higher Ground* report on voluntary property buyouts. The report concluded that for many floodplain communities, voluntary buyouts of repetitive loss structures would generate substantially greater long-term cost savings than continuing to rebuild these properties after every flood.[243] Specifically, past buyouts of repetitive loss structures have generated $2 in reduction of future flood insurance payments *alone* for every $1 invested.[244] Although the *Higher Ground* report focused on mitigation of repetitive loss properties within the NFIP, it is clear that the economic benefits of property acquisition programs likely would be even greater if other benefits were included in calculating the savings. For instance, relocation of large areas of high-risk development would eliminate many federal, state, and local expenditures for flood response, including:

- Expenses of maintaining and repairing flood control structures that formerly protected the relocated development;
- Expenses of maintaining, repairing and rebuilding public infrastructure and buildings;
- Costs of disaster relief and flood insurance subsidies and payments; and

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[240] In contrast to the relatively unsuccessful Upton-Jones Act property acquisition program, recent federal and state property acquisition programs have purchased thousands of repetitive loss properties. *See* HIGHER GROUND, *supra* note 35, at 29–33. For an overview of state and federal property acquisition programs in high-hazard coastal areas, see generally COASTAL HAZARDS MITIGATION, *supra* note 52, at 65–87.

[241] *See* 42 U.S.C. § 5170c(b) (2000) (establishing program for purchase or mitigation of repetitive loss properties).

[242] *See* ACCOUNTABILITY REPORT, *supra* note 11, at 28–30 (describing increased emphasis on, inter alia, public acquisition of properties suffering repetitive flood losses under Repetitive Loss Initiative).

[243] *See* HIGHER GROUND, *supra* note 35, at 60–63 (describing savings generated by past buyouts and overall costs of repetitive loss structures to NFIP); *id.* at 130–32 (recommending substantial increases in voluntary buyout programs and vigorous enforcement of NFIP regulations requiring elevation or removal of substantially damaged structures).

[244] *See id.* at 60 (citing DONNA ERAT, THE 1993 AND 1995 MIDWEST FLOODS: HAZARD MITIGATION THROUGH PROPERTY ACQUISITION AND RELOCATION PROGRAM 7, 9 (1995)) (on file with the Harvard Environmental Law Review).

- Costs of future development.[245]

Beyond savings generated by avoiding costs associated with existing development, property acquisition programs also avoid negative externalities that would otherwise be generated by increased future development within the floodplain.[246] And preserved floodplains may create increased opportunities for recreational activities, including fishing and hunting, boating, hiking, and education.[247] Preservation and restoration of floodplains as open space also would tend to increase nearby property values.[248]

One of the reasons property acquisition programs can be so effective at reducing flood-related losses is that they eliminate many of the factors that drive political action on behalf of floodplain property interests. For instance, much of the resistance to traditional zoning regulations that limit uses of land arises from the perception that the zoning entity has imposed substantial costs on private property owners for public purposes without compensation. This characterization, espoused most vocally by property rights advocates who gained recognition following the 1994 congressional elections,[249] is largely defeated where the property owner actually receives compensation for the property rights acquired by the government.

Further, property acquisition, over time, reduces the size of the potential special interest group of floodplain landowners. Eventually, the political will to continue the flow of subsidies to the floodplains should diminish as floodplain property owners are bought out and relocate. In contrast, other reforms that fail to compensate landowners for private property rights acquired will generate political resistance that, at best, will slow the rate of reform, and at worst will prevent reform altogether. For example, prohibitions on constructing permanent seawalls and other structural barriers against storm surge have met with substantial legal and political resistance, and in some cases outright civil disobedience.[250]

Finally, property acquisition programs protect floodplain land use management programs from future political and economic pressures. For example, the CBRS has been subjected to numerous "technical corrections" on behalf of developers seeking to remove private property from

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[245] *See, e.g.*, H. Crane Miller, Turning the Tide on Wasted Tax Dollars: Potential Federal Savings From Additions to Coastal Barrier Resources System 1–4 (1989) (arguing that expansion of CBRS to limit federal spending on additional coastal barrier island units would provide substantial savings in the form of avoided capital expenses for structural flood controls, disaster relief, and flood insurance subsidies).

[246] *Cf. id*.

[247] *See* Nat'l Research Council, Restoration of Aquatic Ecosystems 176–77 (1992).

[248] *See id.*

[249] *See supra* note 14 and accompanying text.

[250] *See* St. Amand, *supra* note 7, at 17–18 (discussing difficulties faced by local Massachusetts officials attempting to prevent homeowners from erecting permanent revetments to protect oceanfront properties from erosion and flooding).

the program.[251] Many of these "technical corrections" may be legitimate attempts to correct over inclusive CBRS maps, but many more are likely to be legislative responses to political pressures by barrier island property owners to reopen their properties to valuable federal subsidies.[252] In contrast, property acquisition avoids such post-hoc pressures to permit development back into floodplains. Because the property rights necessary for development are held by government entities, or other entities such as conservation organizations, wetlands banks, or similar agencies, political pressures are less likely to force redevelopment of floodplains.[253]

But buyouts and similar mitigation programs have not reached their full potential as floodplain management tools because, at least in the short-term, they are "prohibitively costly."[254] Buyouts require visible budget

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[251] *See, e.g.*, 145 CONG. REC. H12,844 (daily ed. Nov. 18, 1999) (statement of Rep. George Miller) (arguing in favor of technical correction of alleged mapping error on ground that there was no evidence "to prove conclusively that Congress intended to include private lands abutting the boundaries of the State park when it created this OPA in 1990."); 145 CONG. REC. H12,844–45 (daily ed. Nov. 18, 1999) (statement of Rep. Saxton) (discussing proposed bill to remove 32 acres of private land from CBRS and add 245 acres of existing state park land to CBRS for alleged net increase of 213 acres). The alleged "net" increases in CBRS acreage resulting from withdrawing private land and purportedly replacing it with existing state park lands may be a legislative shell game intended to preserve the illusion of net increases in the size of the CBRS. Adding state park lands to the CBRS may not provide any additional protection against development on those lands, while excluding or withdrawing private land under the guise of a technical correction immediately opens that property to receive development-maintaining or -promoting federal subsidies. *See* 145 CONG. REC. H8418 (daily ed. Sept. 21, 1999) (statement of Rep. Blumenauer) (arguing that in removing 272 acres of private land from CBRS and replacing it with 3390 acres of existing state park lands, "[w]e are whittling away, bit by bit, pulling land out of [the CBRS].").

[252] *See, e.g.*, DEAN, *supra* note 40, at 194–95 (describing efforts of developers to remove Florida barrier island units from CBRS); *see also* H. REP. NO. 104-452, at 12 (1996) (reporting dissenting views of Reps. Miller, Studds, Vento, Pallone, and Kildee) ("We oppose H.R. 2100 [104th Cong. (1995)] because it does not make technical corrections to the [CBRS]. It makes substantive changes to the [CBRS]. . . . If we continually re-examine the [CBRS] in light of new and creative interpretations of the mapping criteria, we will undermine the integrity of the [CBRS]."); S. REP. NO. 103-398 (1994) (conference report on H.R. 4598, 103d Cong. (1994), directing technical corrections to maps of CBRS areas in 1994 by property owners claiming that their property was sufficiently developed prior to 1982 passage of CBRA to merit exclusion from CBRS). The "technical" nature of these corrections is especially dubious where property owners apparently waited years after the initial inclusion of these areas within the CBRS before attempting to obtain legislative action. Affected private property owners with development preexisting the CBRS would likely notice and dispute immediately their inclusion within the system. In *Bostic v. United States*, 581 F. Supp. 254, 255 (E.D.N.C. 1984), for example, the landowners filed suit to enjoin CBRS designation of their property one day before the CBRA's prohibition on writing federal flood insurance policies for CBRS properties went into effect. In contrast, it is more likely that legislative changes more than a decade after that prohibition went into effect reflect post-designation development that property owners now seek to remove from the program.

[253] *See* Titus, *supra* note 7, at 1329–34 (noting public less likely to surrender property rights than to relax regulatory restrictions).

[254] PHILIPPI, *supra* note 33, at 115; *see also* DEAN, *supra* note 40, at 213–14 (noting that rising coastal real estate prices have made buyouts increasingly more expensive, but some individuals, organizations, and government entities have engaged in a limited number

appropriations for which the agency, and ultimately Congress or state legislatures, must account.[255] In contrast, disaster relief costs are largely determined, in recent years, by politicians competing to show their constituents that they can deliver aid to disaster-stricken areas. While other floodplain management techniques may fail to control flood damages or protect floodplain economic and environmental values long-term, the short-term costs of using taxpayer dollars to purchase high-risk floodplain properties have prevented that technique from gaining either political or fiscal acceptance. As a consequence, floodplain management policy must adapt to find some means of reducing the cost of public acquisition of high-risk and environmentally sensitive floodplain properties.

B. Avoiding Unjust Compensation for Past Givings: Crafting a Givings Recapture Mechanism

The high cost of purchasing high-risk or environmentally sensitive properties to remove floodplain development is ironic since much of the value of the properties to be purchased derives directly or indirectly from governmental givings through past responses to flooding. To succeed on the large scale necessary to effect a meaningful retreat from high-risk floodplain development and preserve or restore floodplain environments, property acquisition programs must begin to recapture or otherwise avoid overcompensating landowners for government givings attributable to past flood controls.

Additionally, recapturing givings directly traceable to past government flood responses makes sense as a matter of policy and justice. First, givings recapture promotes and protects the principles of equity and fairness that lie at the heart of the Fifth Amendment's just compensation clause.[256] "Just compensation" requires, tautologically, that the compensation to a condemnee be just, i.e., "the full monetary equivalent of the property taken."[257] But justice in affording compensation for private property taken for public use works both ways. While condemnees are entitled to

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of buyouts to counteract coastal development); Platt, *supra* note 56, at 12 ("Public acquisition of shoreline property (at thousands of dollars per front foot in some areas) is prohibitively expensive.").

[255] *Cf. Hearing on Repetitive Loss Properties*, *supra* note 79, at 59 (prepared statement of Rep. Richard H. Baker that appropriators are hesitant to pay for disasters before they happen).

[256] U.S. CONST. amend. V ("nor shall private property be taken for public use, without just compensation"); *see, e.g.*, United States v. Fuller, 409 U.S. 488, 490 (1973) ("The constitutional requirement of just compensation derives as much content from the basic equitable principles of fairness as it does from technical concepts of property law.") (internal citation omitted); *see also* United States v. Cors, 337 U.S. 325, 332–33 (1949) (assessing fairness of market value criterion for determining "just compensation" due condemnee).

[257] Almota Farmers Elevator & Warehouse Co. v. United States, 409 U.S. 470, 473 (1973).

receive the value of condemned property, they may not demand more than that:

> [Market value paid as just compensation] may be more or less than the owner's investment. He may have acquired the property for less than its worth or he may have paid a speculative and exorbitant price. Its value may have changed substantially while held by him. The return yielded may have been greater or less than interest, taxes, and other carrying charges. The public may not by any means confiscate the benefits, or be required to bear the burden, of the owner's bargain. He is entitled to be put in as good a position pecuniarily as if his property had not been taken. *He must be made whole but is not entitled to more*.[258]

Second, compensating floodplain property owners for past givings from government flood responses provides a windfall or unjust enrichment that can distort market reactions to flood risks.[259] At the moment a government entity determines that it should acquire a floodplain property, it has implicitly acknowledged that past flood control measures have been ineffective at preventing flood losses to the property.[260] In other words, past responses to flooding have an actual value below the value placed upon those responses by the market because of the inability of land markets to account accurately for flood risks.[261]

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[258] Olson v. United States, 292 U.S. 246, 255 (1934) (internal citation omitted, emphasis added).

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> The fairness principle embodied in the Takings Clause is that it is inequitable to "forc[e] some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole." *By the same token, it is inequitable to bestow a benefit upon some people that, in all fairness and justice, should be given to the public as a whole.* In a giving, a small group is able to force the public as a whole to subsidize the group's preferential treatment.

Bell & Parchomovsky, *supra* note 82, at 554 (emphasis added).

[260] Alternatively, the government has implicitly determined that the environmental costs of continuing to preserve the floodplain development in place outweigh the costs of acquiring the property.

[261] Importantly, the acquiring entity is not increasing flood risk to the property in any way by making this acknowledgement. Actual flood risks are a function of physical factors, including the existence and scope of structural flood controls, floodplain dynamics, weather and climate, location and elevation of the property within the floodplain, and value of improvements to the property. All these factors predate the government's decision to acquire the property and should be incorporated fully in the value of the property. Moreover, even where land markets do incorporate the risk of flooding, it is most often through the proxy of capitalizing the cost of flood insurance into land values. This proxy use of flood insurance to affect land values may indicate why some researchers concluded that land markets may discount land values for flood risks but do not adjust values to reflect the number of times that a property has been flooded. *See* U.S. Army Corps of Engineers, *supra* note 91, at 11–12, 13; Speyrer & Ragas, *supra* note 91, at 406 ("However, repeated

As a result of these factors, floodplain property values include value solely attributable to government givings in the form of past flood responses. Overcompensation for those givings reinforces market misperceptions of flood risk and distorts property owners' investment-backed expectations. Given that property owners are inclined to underestimate flood risks, they are more likely to fail to take protective measures against flooding and to invest in property improvements that are not supportable under actual flood risks.[262] Additionally, overcompensation further shifts the risk of flood losses to taxpayers, requiring them to subsidize the decisions of floodplain property owners at ever greater rates. And overcompensation reduces the number and rate of possible property acquisitions for flood mitigation purposes. As a result, government entities must continue to maintain and build structural flood controls, build and repair supporting public infrastructure and facilities, and pay disaster relief and flood insurance to protect floodplain structures that would otherwise have been acquired.

Although there is a clear case against overcompensating landowners in property acquisition programs for the value of past flood control and risk allocation, severing government givings from the compensation package is naturally problematic. Where there is an active market for the private property taken, the just compensation clause generally requires that the landowner receive fair market value for any condemned property.[263] The market value of the condemned property at the time of the taking, however, will tend to capitalize the value of government givings into the overall value of the property. The difficulty arises in attempting to discern where just compensation ends and unjust or inequitable overcompensation begins.

Importantly, courts and legislatures have already developed jurisprudential and statutory approaches to offsetting or recapturing givings arising from past or present government actions affecting the value of nearby property. While not specifically recognized as givings recapture mechanisms, courts and legislatures have attempted to limit such overcompensation through both statutory and judicial doctrines requiring that the amount of

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flooding incidences do not seem to change the insurance cost capitalization."). Because the NFIP typically cannot raise premium rates to reflect repetitive flood losses, and because many properties developed before their communities adopted FIRMs continue to receive substantial subsidies from NFIP's actuarial rates, the flood insurance proxy cannot supply the additional market information that would otherwise cause repetitive flood risks to be accurately incorporated in land values.

[262] *See* HIGHER GROUND, supra note 35, at 7–8. Where flood controls, such as levees, are constructed to protect landowners from periodic floods, development proceeds as if the area has been removed entirely from the floodplain and bears no risk of flood loss. *See id.*

[263] *See, e.g.*, Palazzolo v. Rhode Island, 533 U.S. 606, 625 (2001) (holding that taking compensation requires owner's damages to be based upon fair market value of property taken); Kirby Forest Indus. v. United States, 467 U.S. 1, 10 & n.14 (1984) (holding that just compensation clause typically requires payment of fair market value of property taken unless market value is too difficult to determine or would result in manifest injustice to owner or to public).

just compensation for a taking be offset against some increases in value created by government action.

1. Statutory Givings Recapture Mechanisms

Statutory givings recapture mechanisms include specific statutory instructions to offset special benefits that government actions may have conferred on condemned property—or, in the case of a partial taking, on the remaining portion of the owner's property—as well as less direct means of givings recapture such as exactions and impact fees.[264] For instance, the River and Harbors Improvement Act provides that in the case of a taking of only a portion of a parcel for improvement of navigable waterways "the jury or other tribunal awarding the just compensation . . . shall take into consideration by way of reducing the amount of compensation or damages any special and direct benefits to the remainder arising from the improvement."[265] The River and Harbors Improvement Act recognizes government givings affecting the condemnee's remaining parcel as an offset against the compensation due to the condemnee as a result of the taking. Consequently, where the value of the remaining parcel is dramatically increased by the improvements to the navigable waterway, that increase may altogether offset the value of the condemned tract.

Thus, in *United States v. Fort Smith River Development Corp.*, river channel improvements necessitating the condemnation at issue rendered the remainder more suitable for industrial use, rather than agricultural use, by constructing revetments to prevent the remainder from eroding.[266] The court held that the River and Harbors Improvement Act required consideration of whether the taking rendered the land more valuable by improving its suitability for the more intensive industrial use.[267] The increase in the value of the remainder was to be set off against the value of the taken parcel to determine the net value to be paid as just compensation.[268]

State and local governments have developed other statutory mechanisms to recapture givings by forcing floodplain land markets to (1) exclude value attributable to past flood controls or risk allocation mechanisms, or (2) recapture that value from property owners.[269] To exclude the value of

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[264] Statutory givings recapture mechanisms, of course, cannot constitutionally exceed the limits on givings recapture under the just compensation clause.

[265] 33 U.S.C. § 595 (2000).

[266] 349 F.2d 522, 525 (8th Cir. 1965).

[267] *Id.*; *see also* United States v. Trout, 386 F.2d 216, 222 (5th Cir. 1967) (reversing and requiring lower court to reconsider government's "evidence of comparable sales to prove that special benefits to the remainder *nearly offset* the landowners' loss of 210 acres") (emphasis added); *accord* United States v. 2,477.79 Acres of Land, 259 F.2d 23, 25–26 (5th Cir. 1958) (finding that development of dam and reservoir potentially conferred on remainder special benefits in excess of value of land taken for reservoir).

[268] *See Fort Smith River Dev.*, 349 F.2d at 525.

[269] For a discussion of statutory and regulatory attempts by local or state governments to recapture benefits conferred on landowners by government action, see generally Kades,

past flood controls, state and local governments have employed land use planning techniques that limit the values of floodplain properties.[270] These techniques include zoning restrictions, building codes,[271] and setback requirements.[272] And some commentators have suggested rebuilding restrictions for flood-damaged structures, rolling easements, and prohibitions on permanent flood protections such as seawalls and groins.[273] All of these approaches would ostensibly force floodplain owners to incorporate the costs of these restrictions into property values.

For example, exactions and impact fees can be viewed not only as a means of forcing developers to compensate the community for the new burdens imposed by the development, but also as a rough means of recapturing givings arising from past community investments that the developer seeks to exploit. Specifically, where new development imposes parasitic uses on established communities, much of the value of the new development is created by preexisting community investments in open space, public facilities, infrastructure, and zoning.[274] Exactions and impact fees

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supra note 21, at 1531–57. Professor Kades limits his discussion to "windfalls"—i.e., "economic gains independent of work, planning, or other productive activities that society wishes to reward." *Id.* at 1491. It is important to distinguish such "windfalls" from the concepts of givings and givings recapture. Windfalls implicate the right of society to claim from an individual unearned benefits, regardless of their source, for redistribution of those benefits to society at large. *See id.* In contrast, givings are the results of government distributions of benefits to society or some portion thereof, rendering moot, or at least redundant, the question of whether society should claim those givings for redistribution. Professor Kades's analysis of windfall capture mechanisms illustrates that governments have employed a broad array of statutory devices to capture windfalls, whether those windfalls arose from pure "dumb luck," government action, or other sources. *See id.* at 1540–41 (describing attempts to tax "excess profits" arising from wartime economy and government requirements); *id.* at 1533–35 (describing attempts by local governments to tax benefits accruing to landowners from zoning or other land use measures, including Zoning by Special Assessment Financed Eminent Domain ("ZSAFED") and Special Capital and Real Estate Windfall Taxes ("SCREWTs") practices); *id.* at 1546–52 (describing Windfall Profit Tax on Oil, an excise tax levied on oil producers to capture windfalls allegedly generated by oil price deregulation).

[270] *See* Palazzolo v. Rhode Island, 533 U.S. 606, 625 (2001) (holding that fair market value of property taken depends in part on use restrictions imposed by zoning or regulatory limitations).

[271] FEMA, for example, has promulgated minimum building code provisions that communities participating in the NFIP must adopt for their residents to be eligible to obtain flood insurance under the program. *See* 44 C.F.R. § 60.1–.26 (2002). NFIP-mandated building codes specify such criteria as elevation of new construction, anchoring of structures, construction with flood-resistant materials, and location of electrical, heating, ventilation, plumbing, air conditioning, sewer, gas and water systems. *See* 44 C.F.R. § 60.3.

[272] *See, e.g.*, South Carolina Beachfront Management Act, S.C. CODE ANN. § 48-39-290 (Law. Co-op. Supp. 2002); *see also* Esposito v. S.C. Coastal Council, 939 F.2d 165, 170 (4th Cir. 1991) (upholding South Carolina Beachfront Management Act setback requirements against takings challenge).

[273] *See supra* note 209 and accompanying text; *see also* Titus, *supra* note 7, at 1326.

[274] *See, e.g.*, Euclid v. Ambler Realty Co., 272 U.S. 365, 394 (1926) ("[V]ery often the apartment house is a *mere parasite*, constructed in order to take advantage of the open spaces and attractive surroundings created by the residential character of the district.") (emphasis added). The value that the new development seeks to exploit has already been created in part by the community's prior choices with respect to land use and public infra-

may permit a community to force new development to pay for a share of the givings that would otherwise attach to new development by virtue of these prior community decisions and investments.

Although exactions and impact fees are an extremely rough measure that only potentially and indirectly recaptures givings, they are a valid tool to prevent developers from fully retaining the benefits of preexisting community investments.[275] But at least with respect to structural flood control measures, exactions and impact fees could be used to force new development to pay for the increased value conferred upon the development through those flood controls. Even though such exactions likely would recapture only a small portion of total government flood control givings to floodplain property owners, imposing these additional costs would assist land markets to incorporate some portion of flood risks into land values.

2. Givings Recapture Doctrines Under the Just Compensation Clause

Besides explicit statutory measures for recapturing givings, or preventing them altogether, the U.S. Supreme Court has established judicial doctrines within Fifth Amendment just compensation jurisprudence to prevent the public from overcompensating condemnees for the value of government givings. At the most general level, courts have recognized the role of government givings in calculating diminutions in property values caused by government regulations. As Justice Holmes observed in *Pennsylvania Coal Co. v. Mahon*, "Government hardly could go on if to some extent values incident to property could not be diminished without paying for every such change in the general law," and such diminutions in value are justifiable because they secure an "average reciprocity of advantage" for society and for the burdened landowner.[276] In other words,

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structure and facilities improvements.

[275] Professors Bell and Parchomovsky argue that exactions are a poor technique to recapture government givings. First, exactions cover only a small segment of givings, and are not assessed unless the local government will incur increased infrastructure burdens as a result of the new development. *See* Bell & Parchomovsky, *supra* note 82, at 610. Second, to the extent exactions do recapture some out-of-pocket government costs, they fail to recapture increases in value of the developer's property caused by government givings. *See id.* at 609–10.

[276] 260 U.S. 393, 413 (1922); *see* Cordes, *supra* note 14, at 648. Closely related to the idea of givings is the concept of reciprocity, and in particular "general reciprocity." Whereas specific reciprocity concerns the reciprocal benefits flowing from the regulation creating the burden, general reciprocity considers the reciprocal benefits and burdens of regulatory life in general. Thus, even if a particular restriction might not provide significant specific reciprocity for an affected party, there are other instances where the regulated party receives benefits at the expense of others. Over the long run, such benefits and burdens tend to even out. Therefore, as noted by the Supreme Court on several occasions, it is usually fair to assume that a particular regulatory burden is simply "adjusting the benefits and burdens of economic life" to secure an "average reciprocity of advantage." *Id.* at 648–49 (citing Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1017–18 (1992); Penn Cent. Transp. Co. v. New

Holmes's average reciprocity of advantage dictum posits that government givings benefit landowners in roughly the same proportion that landowners suffer diminutions in property values caused by regulation.[277]

Beyond the generalized average reciprocity of advantage mechanism, courts have created specific limitations on the just compensation clause that attempt to limit overcompensation to landowners for government givings. Typically seen as general rules for offsetting or limiting compensation due for takings, these offset mechanisms also represent existing limitations on the ability of government to target and attempt to recapture givings at the moment of condemnation. These limitations include prohibitions on:

- compensation for special or subjective value to the condemnee or the condemnor;
- compensation for value resulting because of—or subsequent to—the taking;
- compensation for special benefits accruing to the remaining parcel as a result of a partial taking;
- compensation for value resulting from combination of the condemned parcel with other government rights; and
- compensation for increases in market value caused by shortages resulting from government demand.

The measure of just compensation defies any hard and fast rule. Value to any particular owner or condemnor is entirely subjective, depending on the uses that party intends for the property, the psychological importance of owning that parcel, and a host of other factors impossible to determine with objective accuracy. Additionally, the subjective values that the condemnor and condemnee attach to any particular parcel are nearly certain to differ, often dramatically.[278] The condemnee's relatively worthless

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York, 438 U.S. 104, 124 (1978)); *cf.* Cordes, *supra* note 85, at 690–91 (discussing balance between private property interests and need for public regulation of property to secure societal benefits).

[277] Likewise, in *Kirby Forest Industries v. United States*, the Court observed that diminutions in property values that do not rise to the level of a taking "must be borne by individual landowners as concomitants of 'the advantage of living and doing business in a civilized community.'" 467 U.S. 1, 14 (1984). Thus, for the vast majority of government-caused diminutions of property value, the Supreme Court has regularly recognized that property owners will receive some recompense indirectly through other benefits allegedly bestowed upon the community by government action.

[278] *See Kirby Forest Indus.*, 467 U.S. at 10 n.15 (explaining that the Court is "willing to tolerate . . . occasional inequity because of difficulty of assessing the value an individual places upon a particular piece of property"); *see also* United States v. 564.54 Acres of Land, 441 U.S. 506, 511 (1979) (noting that a market-value standard is "a useful and generally sufficient tool for ascertaining the compensation required to make the owner whole [but] . . . such an award does not necessarily compensate for all values an owner may derive from his property" and that "fair market value does not include the special value of property to the owner arising from its adaptability to his particular use").

undeveloped brushland may have substantial value to government seeking to construct a reservoir or railroad right-of-way.[279] Because of the impossibility of determining the subjective value of a parcel to the condemnee or the government, courts have held that the just compensation clause requires the use of objective standards of value—principally the market value of the property—and specifically excludes any special values that the land may have to either the condemnee or the condemnor.[280]

In addition to the prohibition on compensation for special values to the parties, courts have excluded compensation for increments of value attributable to the taking itself. In *United States v. Miller*, for example, the Supreme Court held that the condemnees were not entitled to an increase in value to their lands attributable to the government's authorization of condemnations for the relocation of a railroad right-of-way and the fact that "one probable route was marked out over the [condemnees'] lands."[281] There, Congress had authorized condemnation of a railroad right-of-way to relocate a railroad displaced by a separate dam and reservoir project. In planning the relocation, the condemning agency marked out potential routes, and plaintiffs purchased and developed property along those routes, apparently calculating that property values would increase after construction of the railroad. The Court rejected the condemnees' claim for compensation measured as of the date of the actual taking, reasoning that the market value of the property had been increased by speculation over the benefits that would accrue if the railroad were relocated near any particular parcel.[282] In response to such speculation, the Court adopted the "scope of the project rule," which prohibits compensation for any value attributable to the fact that the condemned tract was "probably within the scope of the project from the time the Government was committed to it."[283] Because the original railroad relocation project had identified the condemnees' land as one of several potential routes for the relocated railroad right-of-way, any increase in value attributable to that potential project was excluded from the just compensation calculation.[284]

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[279] *See, e.g.*, United State v. Miller, 317 U.S. 369, 376–77 (1943) (stating that landowners speculated in undeveloped brushland over which railroad project potentially could have been built).

[280] *See, e.g.*, *564.54 Acres of Land*, 441 U.S. at 511–12; *Miller*, 317 U.S. at 375 (citing Bauman v. Ross, 167 U.S. 548, 574 (1897); Olson v. United States, 292 U.S. 246, 256 (1934)).

[281] 317 U.S. at 377.

[282] *See id.*

[283] *Id.* at 376–77. The "scope of the project rule" was foreshadowed by earlier just compensation cases. For example, in *Shoemaker v. United States*, 147 U.S. 282 (1893), the Court excluded evidence of increases in the value of property located within the potential, but not definite, boundaries of the proposed Rock Creek Park in Washington, D.C., on the basis that the increases were due to the possibility that the property, if not condemned, would be favorably located with respect to the park. *See id.* at 304–05; *see also* Kerr v. S. Park Comm'rs, 117 U.S. 379, 385–87 (1886) (excluding value increment attributable to legislative authorization of creation of park from determination of just compensation).

[284] *See Miller*, 317 U.S. at 376–77.

A third givings recapture doctrine prohibits compensation for any value attributable to association of the condemned tract with preexisting or dominant government property rights. In *United States v. Fuller*,[285] for instance, the Court excluded consideration of values created by the proximity of the condemned parcel to government properties. There, the government condemned a parcel held in fee simple that adjoined both grazing land leased from the state, and federal land upon which the fee owner held grazing permits revocable by the government at will. Even though it acknowledged that the proximity of the fee parcel to the government lands was an element of value that would be considered on the open market, the Court held that the government was not required to compensate for value arising from that proximity and the availability of revocable federal grazing rights: "These cases go far toward establishing the general principle that the Government as condemnor may not be required to compensate for elements of value the government has created, or that it might have destroyed under the exercise of governmental authority other than the power of eminent domain."[286]

The *Fuller* Court relied heavily on cases holding that no increment of value attributable to riparian rights of lands adjacent to navigable waters may be included in determining just compensation because those riparian rights are subject to a dominant navigational servitude held by the federal government under the commerce power.[287] As a consequence of that dominant servitude, the government need not compensate the landowner for any diminution of the landowner's former enjoyment of access to the waterway.[288]

But the *Fuller* Court did not intend to recapture all government givings arising from mere proximity to government-funded projects. Instead, *Fuller* excludes only that increment of value arising from the aggregation of the privately owned parcel with government lands "to form a privately controlled unit from which the public would be excluded."[289] Thus, *Fuller* and the riparian rights cases on which it relies can be seen not as recapture of value "created" by the government, but rather as a matter of not

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[285] 409 U.S. 488 (1973).

[286] *Id.* at 492.

[287] *See id.* at 491 (citing United States v. Rands, 389 U.S. 121 (1967); United States v. Twin City Power Co., 350 U.S. 222 (1956); United States v. Commodore Park, 324 U.S. 386 (1945)); *see also* U.S. CONST. art. I, § 8, cl. 3.

[288] *See* United States v. Va. Elec. & Power Co., 365 U.S. 624, 627–28 (1961) ("The damage sustained [by exercise of government's dominant navigational servitude] results not from a taking of the riparian owner's property in the stream bed, but from the lawful exercise of a power to which that property has always been subject.") (quoting United States v. Chicago, Milwaukee, St. Paul & Pac. R.R. Co., 312 U.S. 592, 596–97 (1941)); *Twin City Power*, 350 U.S. at 228 ("What the Government can grant or withhold and exploit for its own benefit has a value that is peculiar to it and that no other user enjoys. . . . To require the United States to pay for this water-power value would be to create private claims in the public domain.").

[289] United States v. Fuller, 409 U.S. 488, 493 (1973).

requiring the government to compensate condemnees for property rights the government already owns at the time of the condemnation.[290]

In contrast to the close connection between government rights and the condemned tract required in *Fuller* and similar cases, the Court also has limited the just compensation clause to exclude market value increments caused by shortages resulting from mere increases in government demand within a particular market. In *United States v. Cors*,[291] for instance, the Court held that the government could not be forced to compensate a tugboat owner for appreciation in the market value of all tugs caused by the government's own increased requirements for such vessels to service the wartime navy. Importantly, where the givings recapture doctrines of *Miller* and *Fuller* limit recapture only to givings resulting within one project, the *Cors* Court recognized that the just compensation clause may permit recapture of government givings outside of a single discrete project:

> It is not fair that the government be required to pay the enhanced price which its demand alone has created. That enhancement reflects elements of value that was created by the urgency of its need for the Article. It does not reflect what "a willing buyer would pay in cash to a willing seller," . . . in a fair market. It represents what can be exacted from the government whose demands in the emergency have created a sellers' market. In this situation, as in the case of land included in a proposed project of the government, the enhanced value reflects speculation as to what the government can be compelled to pay. That is a hold-up value, not a fair market value. *That is a value which the government itself created and hence in fairness should not be required to pay*.[292]

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[290] *Cf.* Avenal v. United States, 100 F.3d 933, 936–37 (Fed. Cir. 1996). In *Avenal*, the Federal Circuit held a takings claim invalid where the owners of oyster bed leases had taken advantage of prior government projects that rendered the beds suitable for oyster cultivation but later faced loss of cultivation capacity because of subsequent government projects. Reasoning that the leased beds were rendered suitable for oyster cultivation only because past government projects had raised the salinity of the surrounding water, the court opined that the lessees could not "insist on a guarantee of non-interference by government when they well knew or should have known that . . . government actions were being planned . . . that would directly offset their new economic investments." *Id.* at 937. *But cf.* Palazzolo v. Rhode Island, 533 U.S. 606, 626–29 (2001) (holding regulatory takings claim not barred by post-regulation acquisition of burdened property). Although it addressed the issues of takings and interference with reasonable investment-backed expectations, and not just compensation or givings recapture, *Avenal* may indicate the existence of a bar to retaining any rights to givings created by unrelated government projects that provide incidental benefits to affected landowners.

[291] 337 U.S. 325 (1949).

[292] *Id.* at 333–34 (emphasis added). Although *Cors* is largely concerned with judicially created givings avoidance or recapture mechanisms, that case also addressed statutory

Cors thus appears to justify government recapture of givings with only a tenuous connection to government action, where government has interceded in the private marketplace to such a degree that price increases subsequent to that intervention must be attributed to the government action. Specifically, *Cors* attempts to permit the government to avoid compensation for the costs of perceived market failures such as holdouts and profiteers in times of national crisis.[293]

But the limits of this doctrine, as noted by the dissent, are murky. Specifically, the *Cors* majority could not explain how to unbundle government-created value from owner-created or intrinsic value based solely on market demand increases. As the dissent observed, when the government made its first seizure of tugs to assist the war effort, the market value of those tugs was unaffected by any government interventions.[294] "A subsequent increase in market value, though precipitated by the shortage caused by the earlier taking, could be a direct result only of the tug operators' need for the remaining tugs, not the Government's for those it had taken."[295] Consequently, because the market value of tugs remaining in private hands was at least partly a function of the market's need for those tugs rather than the government's, the minority saw no principled means of excluding only the market value increments attributable to government need.[296]

3. Crafting a Givings Recapture Mechanism for Coastal Floodplains

Combined, the just compensation cases addressed above illustrate that givings recapture at condemnation requires a clear and exclusive causal nexus between the government action alleged to generate a giving and the purported increase in the value of the landowner's property or remaining parcel. Thus, in *Miller*, the Court limited the scope of the project rule to properties probably within the scope of the project originally contemplated by the government and excluded from the rule's operation properties brought within the project by subsequent enlargements of project scope.[297] In the former case, value increases would only be attributable to "speculation by [property owners], or by possible purchasers from them,

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givings recapture mechanisms in the Merchant Marine Act of 1936. The Supreme Court held that the prohibition in § 902(a) of the Merchant Marine Act of 1936 that "in no case shall the value of the property taken or used be enhanced by the causes necessitating the taking or use" satisfied the just compensation clause. *Id*. at 331–32.

[293] *See id.* at 333.

[294] *Id.* at 343–44 (Frankfurter, J., dissenting); *see also* Kades, *supra* note 21, at 1540–46 (discussing difficulty in establishing appropriate rates at which to tax "excess profits" during World Wars I and II).

[295] *Cors*, 337 U.S. at 343 (Frankfurter, J., dissenting).

[296] *See id.* at 344–45.

[297] *See* United States v. Miller, 317 U.S. 369, 376–77 (1943).

as to what the Government would be compelled to pay as compensation."[298] In contrast, where a parcel outside the original scope of the government project increases in value by reason of proximity to a government project, that increment of value is created by factors other than government demand:

> But the [scope of the project] rule also provides that if project *A* did not initially include property *x*, the Government must pay compensation for any additional value property *x* enjoys because of its proximity to project *A* as originally undertaken. This value, while in a sense created by the Government, is not attributable to the fact that the Government has a unique demand for property *x* and has committed itself to taking property *x* for inclusion in project *A*, but rather is the value of beneficial uses for which there is a private market demand, and, as such, is a true element of fair market value.[299]

Under this analysis, the government project would thus be similar in effect to tossing a rock—its diameter symbolizing the original scope of the project—into a small pool. The water immediately underneath the rock as it hits the surface would be within the scope of the project rule. But the rock also sends out concentric rings of ripples. While the ripples might at first appear to be solely influenced by the impact of the rock, other objects within the pool quickly reflect the ripples to create new patterns within the entire pool. And only in extraordinary cases will the "pool" be still at the time the rock is thrown—other forces constantly generate changes and adjustments within land markets that will immediately affect how the market reacts to government actions.

Thus, in *320.0 Acres of Land* the Fifth Circuit held that the government could not exclude from the just compensation calculus value increments that had accrued to the condemned properties at issue in the eighteen years between initial approval of the project and condemnation proceedings.[300] There, Congress had approved an enlargement of the Everglades National Park in 1958, but did not appropriate significant funds for land acquisition until at least 1966.[301] Additionally, the Department of the Interior, between 1959 and 1962, had informed landowners within the

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[298] *Id.* at 377.

[299] United States v. 320.0 Acres of Land, 605 F.2d 762, 787–88 (5th Cir. 1979). The *320.0 Acres of Land* Court further noted that a compensation rule that permitted the government to exclude increments of value attributable to *proximity* to a government project "would place a restraint on the free use and marketability of lands near Government projects." *Id.* at 788 n.33. Such a rule would thus ignore that other factors besides mere proximity to the government project would affect parcels not included in the original scope of the project. *See id.*

[300] *Id.* at 796–98.

[301] *Id.* at 797.

enlarged project area that no condemnations were to begin until Congress appropriated sufficient funds for that purpose and in the meantime property owners were "free to use and sell their properties as if their land were outside a Government project."[302]

The court concluded that these three factors—the length of time between project approval and condemnation of land ostensibly within the project expansion, the lack of commitment by the government to implement the project, and the assurances that property owners were free to sell their lands—prevented the government from using the scope of the project rule to exclude value increments accruing to the properties since 1958.[303] In other words, the government's failure to take action permitted the infiltration of private market influences potentially unrelated to the government project. This, in turn, severed the exclusive causal nexus between the government project and additional value increments accruing to the property. In short, where value increments are not clearly and solely attributable to government action, the just compensation clause does not permit recapture of those givings as an offset at condemnation.

The judicial offset or givings recapture mechanisms thus implicitly recognize the impossibility of separating value attributable to givings from value attributable to private investment or action of the private markets where there has been any significant interaction between those forces.[304] For example, while just compensation does not include benefits accruing to a parcel by reason of the project necessitating a taking,[305] once that project has been completed, the government must compensate landowners for any increment of value arising from the past project if it later condemns the affected property.[306] After construction of government-funded improvements, it becomes impossible to untangle value allegedly created by government givings from values created by individual investments in improving property.[307] Additionally, the difficulty of determining the value due

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[302] *Id.*

[303] *See 320.0 Acres of Land*, 605 F.2d at 796–98.

[304] *Cf.* Kades, *supra* note 21, at 1541–42.

[305] *See* United States v. Miller, 317 U.S. 369, 376–77 (1943).

[306] *See, e.g.*, United States v. Fuller, 409 U.S. 488, 492–93 (1973) ("The government may not demand that a jury be arbitrarily precluded from considering as an element of value the proximity of a parcel to a post office building, simply because the Government at one time built the post office."). But in the vast majority of cases, since the private market itself is capable of constructing similar structures, there is no good reason that the government should share in the "profits" or any excess value over and above the costs of such improvements. *See supra* note 19 and accompanying text. In such situations, the most that the government can be said to provide to the development of such improvements over and above their costs is the elimination of some transaction costs of private action that in most cases will likely not exceed the separate transaction costs involved with accomplishing the same improvements through the government bureaucracy.

[307] Economists likewise have recognized the difficulty of recapturing government givings resulting from construction of amenities. Economic analysis of urban amenities—locational amenities such as proximity to city centers, protection by flood control works, and access to transportation—illustrate that separating out such givings *after the fact* is, at least for courts, a nigh-impossible task. For an analysis of the difficulty of valuing locational

to such givings and that due to private investments renders such an inquiry prohibitively expensive and inequitable.[308]

Instead of attempting to employ ex post statutory givings recapture mechanisms, a federal givings recapture mechanism could use subsidies already built into existing federal programs as the basis for recapturing givings across entire coastlines. Specifically, the NFIP provides below-market-rate flood insurance to floodplain property owners. Rather than continuing to permit NFIP property owners to retain these subsidies in perpetuity, the NFIP could be amended to incorporate a givings recapture scheme that would permit the government to avoid at least some of the givings provided to the landowner through subsidized insurance rates.

First, the NFIP should be amended to recognize explicitly the amount of the subsidy—the difference between NFIP rates, subsidized or unsubsidized, and what the private insurance market would charge for comparable coverage.[309] In order to ensure a clear and unambiguous connection

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for courts, a nigh-impossible task. For an analysis of the difficulty of valuing locational amenities—i.e., the impact of government-constructed amenities upon property values as a function of multiple factors unique to each parcel—see generally THE ECONOMICS OF URBAN AMENITIES (Douglas B. Diamond, Jr. & George S. Tolley eds., 1982), and C. Ford Runge et al., Government Actions Affecting Land and Property Values: An Empirical Review of Takings and Givings (Lincoln Inst. of Land Policy Working Paper, 1996). Even *Fuller* and the riparian rights cases rely on preexisting government rights, such as the federal government's dominant navigational servitude and the right of the government to terminate grazing leases at will, and not property rights or the eminent domain power to minimize compensation for government givings. *See Fuller*, 409 U.S. at 493 (holding that condemnee may not require government to compensate for values arising from combination of condemnee's property rights with rights which government already owns).

[308] The ability of private markets to provide for their own infrastructure improvements and the difficulty of separating government givings from increments of value created by private investment or action of private markets illustrate why alternative givings structures such as assessing charges for givings upon specified events such as a sale or condemnation of the property may be ultimately unworkable and inequitable. Professors Bell and Parchomovsky suggest one means of assessing givings by providing an initial notice from the government that a property owner has received a giving and classifying that giving as either payable immediately or upon some later realization event such as sale. *See* Bell & Parchomovsky, *supra* note 82, at 601–08. The property owner would then be assessed for the market value of the giving, as determined by government appraisal, subjective value of the giving to either the government or the property owner, or self-assessment by the property owner. *See id.* at 605–08. One issue with this approach is that, except in the most clear and definite cases, it quickly becomes impossible to separate the effects of the government giving from other actions by the private market or individual investment. *See, e.g.*, United States v. Cors, 337 U.S. 325, 343–44 (1949) (Frankfurter, J., dissenting) (discussing difficulties of classifying market value increases as caused by government seizures of tugboats or by private need for remaining tugboats); Olson v. United States, 292 U.S. 246, 257 (1934) ("Elements affecting value that depend upon events or combinations of occurrences which, while within the realm of possibility, are not fairly shown to be reasonably probable should be excluded from consideration for that would be to allow mere speculation and conjecture to become a guide for the ascertainment of value—a thing to be condemned in business transactions as well as in judicial ascertainment of truth."). For example, the indeterminacy of values of flood control improvements such as levees or beach nourishment to beneficiary property owners demonstrates that any attempt to recapture givings in excess of the cost of those improvements likely would be an arbitrary exercise.

[309] The federal flood insurance subsidy takes two forms, as discussed above. Pre-FIRM

between such givings and subsequent attempts to recapture the subsidy, the just compensation clause requires a clear, definite, and unambiguous connection between the government action and increases in property values.[310] While attempts to recognize the amount of givings by measuring property values directly would generate substantial transaction and litigation costs, use of NFIP subsidies as a proxy for some portion of government givings would reduce the costs of defining the amount of the giving and demonstrating the necessary connection between the giving and the costs the government wishes to offset.

Second, that subsidy would then be deemed a credit against the future purchase of redevelopment rights, conservation easements, fee interests, or other property rights sufficient to prevent redevelopment of a property after a predetermined degree of flood damages or other relevant triggering event.[311] Such a triggering event would necessarily be an event that demonstrated that past government flood responses have proven ineffective at reducing flood losses for that property. Triggering events could include the insured property suffering some level of damage from a catastrophic storm, severe damage to surrounding properties, or some level of repeated low-value losses that cumulatively indicate that the property is unsustainably situated on the floodplain.

Upon the occurrence of such a triggering event,[312] the property owner would receive full payment for any insured losses—that is, after all, the purpose of insurance—plus full compensation for whatever property rights are acquired by the government to prevent redevelopment. Importantly, in every instance, the insured would receive full compensation for those property rights, partly in the form of accumulated credits for past subsidies under the NFIP and partly in the form of cash payments.

And by providing insured property owners with explicit accountings of the amount of NFIP subsidies they receive before the triggering event, the government would maintain the clear and unambiguous connection between the past givings and the value the government seeks to recapture in the condemnation of the redevelopment rights. In contrast to potentially ambiguous measures of increases in property value due to other

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structures—approximately twenty-five percent to thirty percent of all insured structures within the program—receive substantial discounts over rates for post-FIRM structures. *See supra* notes 160–161 and accompanying text. Even post-FIRM structures pay rates below what the private insurance market would charge as a result of political influences on rate structure and the inability of FEMA to increase rates above actuarial risks for the purpose of building insurance loss reserves. *See supra* notes 162–177 and accompanying text; *see also* Daniel, *supra* note 177, at 40.

[310] *See supra* notes 297–303 and accompanying text.

[311] If necessary, subsidy rates could even be increased in the event the current amount of the subsidy was deemed insufficient to compensate landowners for their redevelopment rights, or to speed the public acquisition of those rights.

[312] In the event the property never suffers a triggering event, the program could automatically condemn the relevant property rights after sufficient subsidies have accumulated to offset compensation for those rights.

types of government givings such as structural flood controls and infrastructure improvements, the explicit statements of accumulated subsidy credits under the NFIP would avoid the problem of separating values created by government action from values created by property owners or land markets.

This technique would have several advantages over alternative reforms such as eliminating federal subsidies altogether or legislation prohibiting redevelopment following flood damage without compensation. First, such a givings recapture scheme would avoid or reduce substantially the short-term costs of property acquisition or, at the very least, reduce the costs of insuring coastal floodplain properties in high-risk or environmentally sensitive areas. Because this givings recapture mechanism would acquire flood-prone coastal properties over time, rather than immediately, the costs of such acquisition would be spread out over many decades. Consequently, no single administration or legislature would be required to be solely responsible for the costs of acquiring large swaths of coastal properties. Additionally, due to the accumulation of credits from past subsidization, the program should get progressively less expensive to implement over time.

Second, even if large numbers of property owners refuse to participate in such a program—assuming opting out is permitted—the program could still generate substantial savings for federal taxpayers. While coastal floodplain landowners may not want to surrender their future property rights in exchange for a present, but largely unrealizable and intangible, reduction in flood insurance rate premiums,[313] such opt-out behavior is not fatal to the proposed property acquisition scheme. Although legislative or regulatory limitations on disaster relief likely would be required to prevent opt-outs from shifting their costs to the disaster relief program, those who opt out of the program would be forced either to self-insure or to pur-

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[313] Professor Levmore suggests such apparently irrational behavior arises from the tendency of individuals "irrationally" to value the bird in hand more than two in the bush, regardless of whether the value of the two birds in the bush (discounted by the possibility of capturing successfully one or both of them) exceeds the value of the bird in hand. Saul Levmore, *Just Compensation and Just Politics*, 22 CONN. L. REV. 285, 310 (1990) (noting that an interest group will probably fight harder to avoid a loss than to gain an equivalent windfall, "perhaps because it fights more for what it has than for what it wishes it had or because other citizens share a taste for the preservation of the status quo or for some reason related to the general question of why there is an "offer-asking" differential."). In other words, without *over*compensation for the surrender of presently held rights to future redevelopment of coastal floodplain properties, many coastal floodplain landowners will refuse to participate voluntarily in such a property acquisition program. *See id.*; *see also supra* note 39 and accompanying text (observing that many coastal floodplain property owners would locate on coast regardless of availability of disaster relief or flood insurance). Importantly, even though voluntary opt-out behavior may place short-term financial strain on the NFIP through lost premiums, long-term savings from lowered disaster relief payments, fewer demands for coastal infrastructure construction and repair, reduced coastal floodplain development pressures, and reduced risks to human life and the environment likely would offset such short-term costs. Additionally, if voluntary opt-outs place too great a financial strain on the program, program participation could be made mandatory within defined high-risk or environmentally sensitive areas.

chase more expensive private insurance (if available).[314] In any event, so long as those property owners and not the federal government bear the risks of flood losses, floodplain expenditures by taxpayers would be reduced.

Third, the subsidy/credit approach also preserves investment-backed expectations of floodplain property owners and avoids disruptions in the land markets by compensating landowners for both the insured flood losses and the property rights surrendered to prevent redevelopment. In contrast, prohibitions on redevelopment or elimination of all subsidies likely would undercompensate landowners. Eliminating all federal subsidies for floodplain development defeats expectations of property owners who determined their investments based in part in reliance on the continuation of the federal subsidies. Given the increasing use of floodplain property development as a retirement home or investment by aging baby boomers,[315] such a disruption in coastal land values likely would have unforeseen economic consequences. Likewise, redevelopment prohibitions, although they may be characterized as "amortizing the cost to [floodplain] property owners of changes in society's approach" to floodplain management,[316] also would fail to compensate property owners for valuable property rights and may raise takings issues that would further limit the ability of government entities to remove development from coastal floodplains.[317] Further, redevelopment prohibitions would generate market distortions by imposing wipeouts on property owners whose properties were destroyed in the near future, while awarding windfalls to property owners who avoided flood damage beyond actuarial estimates. In contrast, a property acquisition scheme that compensated landowners at the time of a future triggering event, such as substantial flood-related damages, would avoid inequities produced by wipeouts, windfalls, and potential market distortions by both making insurance payments, for which the property owner was paying premiums under the NFIP, and compensating the property owner for whatever remaining "equity" remains with the property owner's redevelopment rights, at the time of the loss.

Fourth, the subsidy/credit approach to givings recapture may avoid some of the political issues that have plagued efforts to reform federal flood management policy in the past. As discussed above, political resistance to floodplain controls—even if overcome initially by upland taxpayer sentiment—can often cause "backsliding" or restriction of those floodplain controls after public attention to the problem of floodplain givings wanes.[318] To avoid such erosion of regulatory controls on existing and future floodplain development, public choice theory suggests that affected landown-

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[314] *See supra* notes 174–177 and accompanying text.
[315] *See supra* notes 46–56 and accompanying text.
[316] Poirier, *supra* note 48, at 289–90.
[317] *See supra* notes 235–236 and accompanying text.
[318] *See supra* notes 234–237 and accompanying text.

ers must be "bought off" to prevent them from forming a powerful interest group opposing the legislative restrictions on their property use.[319] While other methods of restricting backsliding—such as condemnation of rolling easements sufficiently in advance of predicted property losses to require only de minimis compensation to condemnees[320]— arguably impose lower costs on the public fisc, the very cheapness with which such rolling easements could be acquired may fail to prevent powerful political opposition to enforcement of the easements in the event sea level rise occurs.[321] In other words, a $3 payment to a landowner's predecessor in interest made fifty or sixty years prior to a rise in sea level or an increase in the severity of coastal storms sufficient to require abandonment of the property is unlikely to "buy off" the political interest group of wealthy coastal landowners suddenly facing a total loss of their property.[322]

In contrast, a givings recapture mechanism based upon an explicit recognition of existing subsidies may prove an effective bulwark against political opposition to land use restrictions in the future. Such undercut-

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[319] *See* Farber, *supra* note 226, at 131 ("The effect of the compensation requirement is to buy off the [condemnee] landowners and shift the cost of the project to other groups. Politicians will give more weight to costs as a result of this shift *only* if these other groups have more political power than the landowners—which seems unlikely because the other groups are likely to be diffuse."); *see also* Daniel A. Farber, *Public Choice and Just Compensation*, 9 CONST. COMMENT. 279, 293–94 (1992) ("[T]he compensation requirement will buy off the group otherwise most likely to bring costs [of condemnation] forcefully to the attention of the legislators.").

[320] *See* Titus, *supra* note 7, at 1322–23 (projecting cost of purchasing rolling easement prohibiting bulkhead construction to protect property against sea level rise at approximately $3 for a $20,000 site suitable for a $180,000 house).

[321] Under this rolling easement scenario discussed above, there are three possible outcomes with respect to any given property owner: (1) the property owner is undercompensated due to inundation substantially before the projected time used in calculating the discounted present value of the rolling easement purchased by the government, (2) the property owner is perfectly compensated when inundation occurs at the time used in calculating the value of the rolling easement, and (3) the property owner is overcompensated because inundation never occurs or takes longer than projected in calculating the compensation due for the rolling easement. Upon inundation of the property, the undercompensated property owners will have a strong equitable case that the rolling easement should not be enforced because the public will be unjustly enriched at their expense due to the faulty prediction of the length of time before inundation. If the group of undercompensated property owners successfully resists enforcement of the rolling easements, the latter two groups may have at least "a foot in the door" to argue that they likewise should not be forced to comply with the rolling easements.

[322] The National Park Service currently engages in a similar long-term approach in many national parks to ease land from private to public ownership by granting "reservations of use and occupancy" to condemnees or donees of land within national parks, allowing them to remain on their property for a term of years or for life. *See* St. Amand, *supra* note 7, at 18–19. Though, as St. Amand acknowledges, "[t]he Park Service has encountered few problems in enforcing the terms of its reservations of use and occupancy, *perhaps because the areas affected are relatively small and easily monitored*." *See id.* at 19 (emphasis added). But to be effective, restrictions on coastal development and redevelopment must encompass huge swaths of coastline, raising the potential for large and concentrated interest groups opposing enforcement of such reservations or similar schemes, such as previously acquired rolling easements and problems with enforcing and monitoring affected coastlines.

ting of political opposition would work on two levels. First, property owners would, in every case, receive full compensation—in some combination of cash and subsidy credits—for the redevelopment rights or similar restrictive easements acquired by the government. That compensation would substantially undercut arguments by private property rights proponents against government regulation of coastal floodplains that deprives property owners of the value of their property. Second, by providing mostly cash compensation in the early stages of the program, the subsidy/credit approach could potentially build political "momentum" against backsliding since later-affected property owners would face an ever growing body of previous development rights acquisitions under the program. At the same time, the number of likely resisters would diminish as property owners are bought out over time. Resistance under such circumstances would deprive property owners of much of the equitable force of their arguments since they will by that time have enjoyed decades of below-market-cost flood insurance at taxpayer expense, yet apparently would be seeking to keep that subsidy flowing in perpetuity. The combination of political momentum, steadily diminishing interest group numbers, and inequity of retaining development rights despite having been fully compensated through past subsidies could provide future legislatures with sufficient political will to resist attempts to return development to the coasts.

C. Prioritizing Property Acquisitions: The Need for a Federal Response

The third major policy response requires the federal government to identify high-risk or ecologically valuable floodplain areas in which to confine property acquisition efforts. Floodplains by nature defy management on a state or local basis and require a comprehensive watershed-wide or regional approach. Coastal development and erosion control techniques at one point along the shoreline can affect rates of development or erosion further along the shoreline. Additionally, development in one state's or community's coastal region may draw tourism revenues from other states or localities, leading to increased competition for a share of total tourism dollars.[323] And poor planning in coastal floodplain communities can disrupt evacuation and other flood responses in the event of major disasters.[324] The cross-border characteristics of floodplain management

[323] *See supra* note 120 and accompanying text.

[324] *See* COASTAL EXPOSURE AND COMMUNITY PROTECTION, *supra* note 60, at 9:

> Congestion caused by increasing population density can have a profound effect on the efficiency and safety of evacuations. Concerns have also been expressed that many evacuation routes are single-lane roadways at sea level, and that the adequacy of evacuation routes are further affected by the deficiencies and decaying conditions of bridges. For example, emergency management officials acknowledge that it would be impossible to fully evacuate [sic] densely populated southeastern Florida in the amount of time provided by hurricane warnings.

require a consistent response throughout each floodplain to prevent flood responses upstream or further along the coast from externalizing the costs of any particular management policy on downstream or downdrift property owners, localities, or states.[325]

But by the same token, the need for a comprehensive federal approach to floodplain management should not be taken as a license for unlimited federal action within the floodplains. Public acceptance of broad reforms and funding of flood responses peaks quickly at the height of major flood disasters but quickly wanes when the flood has passed.[326] Consequently, flood responses must be prioritized to promote the maximum return from limited public acceptance of ongoing flood mitigation efforts in the absence of a major flood event. Moreover, limiting the federal floodplain management to areas where property acquisition would maximize savings of federal tax dollars acknowledges the federalism concerns driving the traditional reluctance to involve the federal government in state and local land use management and planning issues.

The CBRA provides a model under which the federal government has already undertaken the process of identifying floodplain areas in which to prevent, or at least minimize, future floodplain development. This concept should be expanded to identify not only areas where development incentives should be eliminated, but also those high-risk or environmentally valuable floodplains where the costs of existing development exceed the costs of removing that development to more sustainable low-risk floodplains or upland areas.

The criteria for identifying these areas must focus on two issues. First, if the area or community has suffered a significant number of repetitive flood losses, it should be a prime candidate for implementation of property acquisition programs.[327] Repetitive losses signify floodplain ar-

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see MILETI, *supra* note 89, at 7–8 (describing need for improvement in hazard warnings).

[325] It is theoretically possible that a system of tradable flood/littoral flow easement rights could be used to adjust responses of updrift and downdrift landowners and communities. Updrift floodplain owners and communities theoretically could pay downdrift owners to hold some portion of their floodplain undeveloped for the purpose of eroding as the updrift community interrupts the flow of sand that would otherwise be transported to the downdrift shore.

[326] *See, e.g.*, Long Island Coastal Alliance, Inc., Preserving Long Island's Coastline: A Debate on Policy, Proceedings of the Fifth Annual Conference of the Long Island Coastal Alliance 1 (Apr. 22, 1994) (statement of Gerard Stoddard, Chairman, Long Island Coastal Alliance) "I don't need to remind anyone that it is now two years and four months since the December 1992 nor'easter tore up the Long Island coastline. That length of time is important because some say the public's attention span for shore protection is about exhausted when you get into the third year after a storm."); Rutherford H. Platt, *Floods and Man: A Geographer's Agenda*, *in* 2 ROBERT W. KATES & IAN BURTON, EDS., GEOGRAPHY, RESOURCES, AND ENVIRONMENT 28, 60 (1986) ("The best opportunity to reduce flood losses is immediately after a flood or other disaster."); NATURAL HAZARD MITIGATION, *supra* note 3, at 42 (noting that local communities generally pay little attention to disaster mitigation plans, and that draft mitigation plans are too general to be useful, lack coordination, and overall accord little priority to pre-disaster mitigation efforts).

[327] *See* HIGHER GROUND, *supra* note 35, at 128–29 (calling for increased attention to

eas in which structural flood controls have failed to limit flood losses and consequently federal tax dollars spent building, maintaining, and repairing these structures are largely wasted.[328] Likewise, repetitive flood insurance payments identify structures that were improperly sited or built and are therefore likely responsible for net losses to the disaster relief and flood insurance system.[329]

Second, while repetitive losses provide the clearest indicator of whether floodplain areas are economically unsustainable, other areas may be at risk of catastrophic losses from relatively rare but catastrophic floods. Where possible, these high-risk areas should be identified and included in any targeted property acquisition program.

Identification of such catastrophic risk areas may prove impossible in many circumstances. Repetitive loss properties have been at least partially identified during the last several decades of participation with the NFIP. In contrast, catastrophic risk areas are defined by the presence of rare flooding events outside of the experience of most landowners and lacking any systematic record. Although flood elevation modeling, weather predictions, and anecdotal evidence may assist in identifying some potential areas subject to rare catastrophic risks, it is likely that the majority of these areas may be identifiable only upon actualization of the catastrophic risk itself.

VI. Conclusion

Current governmental responses to flooding suffer from difficulties that prevent those programs from succeeding in diminishing flood risk and flood damages. Moreover, most federal responses to flooding promote direct and fiat givings to coastal floodplain landowners by warping land market perceptions of flood risks, thereby raising property values to the point that public acquisition of coastal floodplain properties becomes prohibitively expensive as a land use management mechanism. But those same programs also provide the keys to a federal, market-based response to the problem of removing development from floodplains where it is economically inefficient, while permitting economically efficient uses to continue in place. Specifically, Congress must consider a new approach to floodplain land use management that incorporates givings recapture mechanisms that will maximize the ability of the government to recover from its own past mistakes in responding to floods.

The NFIP provides an ideal vehicle for givings recapture and property acquisition efforts within identified target areas. The NFIP already provides below-market-rate insurance to both pre- and post- FIRM prop-

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repetitive loss properties for focus of hazard mitigation efforts).

[328] *See id.*

[329] *See id.*

erties. But that subsidy need not be written off as yet another governmental giving to floodplain property owners. Instead, the NFIP could be amended to require explicit recognition of the amount of the subsidy—the difference between NFIP rates and rates that the private insurance market would charge for comparable coverage—and the proportionate value of that subsidy in relation to the value of sufficient property rights to prevent redevelopment of the property in the event the property suffers some pre-determined degree of loss.

Doing so promotes effective floodplain land use management on multiple levels. First, a givings recapture approach permits the government to avoid the Catch-22 of floodplain management, namely that floodplain communities typically fail to implement land use controls until after their floodplains are developed. Instead of abandoning land use management in the face of property values comprised substantially of past direct and fiat givings, givings recapture would permit government to fix past mistakes and effect meaningful land use restrictions to protect human life, property, and the environment from floods and floodplain development. Second, givings recapture avoids some of the potential political opposition—both present and future—to restrictions on floodplain land use. Although no single reform can wholly sidestep these concerns, givings recapture at least moots some of the philosophical and technical objections to restrictive regulation of the coasts by providing full compensation to affected landowners and permitting use of coastal property without externalizing all costs of so doing to taxpayers. Finally, givings recapture injects fairness and rationality into the coastal floodplain management process. Under such a regime, landowners' reasonable investment-backed expectations are protected, while over time the looming specter of recapture of past givings should force land markets to incorporate realistic perceptions of flood risks into property valuation. Combined, the advantages of givings recapture mean that, where necessary, we can make a strategic retreat from the coasts that protects human life, property, and the environment without sacrificing fairness and justice to taxpayers and landowners in the process.