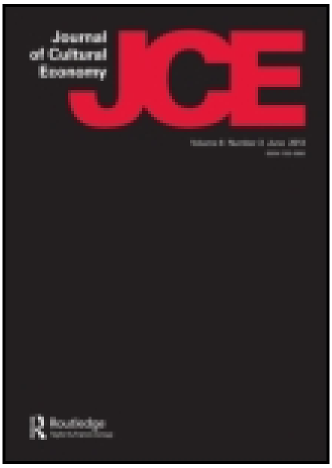

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NEOLIBERALISM AND NATURAL DISASTER
Insurance as political technology of catastrophe

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A substantial recent literature has examined insurance as a mechanism for economizing uncertain but potentially catastrophic events. Less attention has been paid to how insurantial techniques for economizing catastrophe have been deployed as political technologies*. Focusing on discussions of US flood policy in the 1960s, the present article examines how insurance was used to forge new articulations and accommodations between political government and processes of rationalization. On the one hand, insurance provided a* technical solution *to problems that had long confronted US policy-makers: How to reduce losses from floods? How to fully compensate individuals who suffered losses? On the other hand, insurance was a device for* reshaping the aims and objects of government*, and for reframing questions that are more frequently situated at the level of political philosophy: What are the respective responsibilities of individual citizens and government in providing security? What tradeoffs must be made between the provision of security and economic rationality? What values are relevant in orienting public policy? In examining these issues, the article raises questions about standard narratives about the changing relations among risk, responsibility, and security in recent decades, particularly as they relate to neoliberalism.*

KEYWORDS: neoliberalism; catastrophe; risk; economization; calculation; insurance

[There is no reason] why the state should not assist the individuals in providing for those common hazards of life against which, because of their uncertainty, few individuals can make adequate provision. Where, as in the case of sickness and accident, neither the desire to avoid such calamities nor the efforts to overcome their consequences, are as a rule weakened by the provision of assistance, where, in short, we deal with genuinely insurable risks, the case for the state helping to organize a comprehensive system of social insurance is very strong.… To the same category belongs also the increase of security through the state rendering assistance to the victims of such 'acts of God' as earthquakes and floods. Wherever communal action can mitigate disasters against which the individual can neither attempt to guard himself, nor make provision for the consequences, such communal action should undoubtedly be taken. (Friedrich Hayek 1994 [1944], p. 148)

Public relief, flood abatement, and flood protection favor the retention of present occupance, whether desirable or undesirable. With little or no attention to the desirability of such occupance, present policy helps to stabilize uneconomic occupance. Works for protection and abatement minimize the flood hazard at public expense for the most

> part…. Further encroachment is thereby tacitly encouraged…. In effect, the national treasury bears a large part of the costs of those who prefer to live on floodplains, and does so without inquiring as to whether or not such plains afford any pronounced advantages for such occupance…. On the whole, present policy fosters an increasing dependence by individuals and local governments upon the federal government for leadership and financial support in dealing with the flood problem. (Gilbert White 1945 [1942], p. 210)

Introduction

On 27 March 1964, a massive earthquake struck Alaska 75 miles southeast of Anchorage. In dollar terms, the losses were relatively limited. But the crushing damage to some communities led to an outpouring of federal support that appeared to contemporary observers as 'rather special and unusual' – an exceptional response to an exceptional situation (Kunreuther 1968, p. 133). In the following months, a remarkable string of disasters hit the United States: another earthquake, this time in Washington state; record floods in the Pacific Northwest and the Midwest in spring 1965; the deadly Palm Sunday tornadoes in Indiana on April 11; and finally, in September 1965, Hurricane Betsy, which wound along the Florida and Gulf coasts before making its most devastating landfall in New Orleans, where a storm surge overtopped the levees on Lake Pontchartrain and inundated the city's Lower Ninth Ward. This succession of natural disasters spurred an energetic government response. A flurry of hearings, staff reports, and policy proposals culminated in the passage of two signal pieces of legislation. The 1965 Southeast Hurricane Relief Act created more generous terms for federal relief, making the exceptional provisions put in place for the Alaska earthquake one year earlier a normal part of federal policy. The 1965 Flood Act provided funding for a slew of new flood protection works. Among these were projects to strengthen the levees protecting New Orleans that were nearly complete when, forty years later, flood waters from Hurricane Katrina overtopped them again.

If the Federal Government's response to the disasters of 1964 and 1965 was unprecedented in its scale, its character was squarely in line with a well-established tradition. Virtually since the nation's founding the Federal Government had provided relief to individuals who suffered losses in natural disasters. And particularly since the New Deal it had embarked on a vast effort to protect homes and businesses against floods by building dams and levees. The 1965 flood and relief acts bolstered these longstanding pillars of US flood security, providing, as one contemporary observer put it, 'more generous assistance to victims than ever before' (Kunreuther 1968, p. 133).

But precisely as the Federal Government was expanding protection and relief measures, critics cast doubt upon this longstanding approach to flood security. They observed that despite massive investment in protective works losses from natural disasters had not declined. Indeed, such losses had steadily grown because dams, levees, and flood walls had encouraged the development of floodplains where residents might be protected from most floods but would be exposed to 'superdisasters' – rare but massive events that accounted for the majority of damage from natural disasters (Congressional Research Service 1974, p. 5). Meanwhile, generous federal relief led property and business owners to assume that if a flood did occur they would be bailed out, reducing their incentive to stay out of harm's way. In sum, government measures to increase security had only led to greater losses. For critics, therefore, the question was not only how to stop natural events from threatening life and property. It was also how to reform government policies that were contributing to the problems they were designed to solve.[1]

The answer to this question formulated in the 1960s was a program of federal flood insurance, initially proposed by two prominent government studies in the wake of Hurricane Betsy, and passed into law with the Federal Flood Insurance Act of 1968. In the sense of Michel Callon, flood insurance was proposed as a new way to *economize* flood risk and flood security – a new mechanism for expressing the values relevant to flood risk and flood security measures in quantitative, and thus commensurable, and thus calculable terms.[2] Previously, flood security measures such as the construction of dams and levees were assessed through benefit-cost analyses conducted by technical experts. Risk rated insurance – with premiums that reflect the probability of loss in a particular location – was designed to shift the locus of calculation and choice: home and business owners would weigh the benefits of owning property in a flood prone area against the costs of insuring that property.

In a Callonian vein, there is a good deal to say about the technical operation of insurance as a new mechanism for economizing flood risk and flood security. But the present article focuses on a different register. It examines how insurance as a mechanism of economization also functioned as a *political technology* that forged a new articulation and accommodation between political government and processes of rationalization. On the one hand, insurance provided a *technical solution* to problems that had long confronted policy-makers: How to reduce losses from floods? How to compensate individuals who suffer losses? How to assess the costs and benefits of floodplain occupancy? On the other hand, insurance was a device for *reshaping the aims and objects of government*, and for reframing questions that are more frequently situated at the level of political philosophy: What are the responsibilities of individual citizens and what is the responsibility of government in providing security? What tradeoffs must be made between the provision of security and the pursuit of economic rationality? What values are relevant in orienting public policy?

Pursuing these themes of political technology the present discussion examines two ways in which the proponents of flood insurance aimed to reshape the government of catastrophe. First, they sought to make possible a new moral economy of disaster – a new calculus of loss, compensation, and responsibility. Federal relief programs long rested on the assumption that natural disasters were 'acts of God' against which, as Friedrich Hayek wrote in *The Road to Serfdom*, 'the individual [could] neither attempt to guard himself, nor make provisions for the consequences' (Hayek 1994 [1944], p. 148). Individual citizens were treated as unfortunate victims and measures to provide security by socializing the risk of natural disasters were therefore understood as legitimate exceptions to the usual liberal insistence on individual responsibility. Flood insurance, by contrast, was designed to *make floods into a different kind of event* – no longer acts of God but events with foreseeable if not precisely predictable patterns of occurrence. Meanwhile, individuals would be transformed into different kinds of political subjects: calculating agents who could take into account – would, indeed, be forced to take into account – the costs of living in a flood plain. Insurance with risk-adjusted premiums would not require a tradeoff between security and responsibility; rather, security would be achieved precisely *through* individual responsibility.

Second, advocates of insurance understood it as a novel device for defining, calculating, and distributing the values relevant to government. New Deal economics posited that flood works had significant public goods characteristics and would therefore be underprovided by private markets. Government had, therefore, a proper – indeed, essential – role to play in evaluating such works based on expert assessments that weighed the benefits of protection against the costs of construction. Flood insurance, by contrast, was a mechanism for internalizing both the benefits and the costs of flood plain occupancy in the calculative choices made by *individuals*. In this sense, flood insurance rested on new economics or political-economics of catastrophe. Collective decisions in the 'public interest' would be replaced by the choices and values of individual citizens.

Overview

This article proceeds by examining the evolution of governmental reflection on flood risk and flood security from the New Deal through discussions of insurance in the 1960s. After a brief review of traditional US flood security policies it examines two waves of criticism that struck at both the presumed justification for a federal role and at the effects of flood security policies. The first wave of criticism – spearheaded by the environmental geographer Gilbert White – took shape amidst the massive program of dam and levee construction that was launched during the early New Deal. It attacked the premise that 'structural' measures such as dams and levees reduced losses from catastrophic floods, and called into question the calculus of cost and benefit that was used to justify their construction. Its proponents did not, however, question the government role in providing flood security, and they proposed 'non-structural' measures – such as land-use plans – as alternative means through which government could reduce losses from floods. A second wave of criticism – investigated here through the work of the economist John Krutilla – took shape in response to the explosion of relief payments in the 1960s. Building on the arguments of Gilbert White, it advanced a more fundamental critique of the rationale for government involvement in providing flood security in the name of collective values. And it proposed flood insurance as an alternative to both structural and non-structural measures that would reshape the politics of risk and security.

The conclusion, whose theme is signaled by this article's epigraphs, considers how this story fits in to contemporary narratives about the governance of risk and security, both in the United States and more generally. One major strain of critical thought has analyzed a transformation – associated with the emergence of neoliberal technologies of rule – through which risk is shifted from collectivist institutions created during the New Deal to individuals. The present story scrambles this received understanding. In this domain we find neoliberal ideas mobilized to support political aims and collective values that are rarely associated with neoliberalism, such as increased security from flood loss, the nascent values of American environmentalism, and an anti-technocratic politics. In this sense, the story of flood security suggests a substantial reinterpretation of neoliberalism as a critical reflection on governmental practice and as a source of proposals for reforming that practice.

Flood Security and Its Discontents

US Federal Government efforts to provide security in the face of floods traditionally rested on two pillars: the provision of relief and the construction of protective works. As Michelle Landis has shown, federal acts to provide relief can be traced to the earliest years of the American republic. Relief for victims' immediate needs tended to be provided by private charities and local governments. The Federal Government, meanwhile, acted to compensate individuals and businesses for property losses. The rationale for government relief rested on the proposition that these individuals were 'innocent victims of fate rather than irresponsible protagonists in their own misery' and that 'they could not guard against their losses' (Landis 1999, p. 271). It was therefore thought that the usual liberal strictures on government assistance did not apply. Such 'emergency' relief was expanded during the New Deal and then regularized after World War II. If relief had previously been authorized by special acts of Congress that followed a given disaster, then beginning in the early 1950s various federal agencies were granted standing authority to respond to disasters and disburse aid to victims (Congressional Research Service 1974). Relief payments – generally in the form of low-interest loans – ballooned in the 1960s, as the damage from disasters increased, and the terms of relief were progressively liberalized.

The second pillar of US flood security – protection against floods through physical works such as dams and levees – became an important area of federal intervention with a series of flood acts from 1917 to 1938. These acts increased congressional appropriations for flood works and broadened the scope of flood control policy. Previously, flood control had been an adjunct to navigation improvements that were deemed important for the promotion of interstate commerce. But beginning in the 1930s flood control was recognized as a legitimate federal concern in its own right that had broad social and economic importance. The Army Corps of Engineers and the Bureau of Reclamation became major instruments of federal policy as the US entered a period of large-scale hydrological engineering (running roughly from the 1930s to the 1960s) that dramatically transformed patterns of water and land use in the country.

The first criticisms of this paradigm of relief and protection were formulated just as the massive program of dam and levee construction was getting underway and originated from within the New Deal itself. The most important figures in this development were Harlan H. Barrows, a professor of geography at the University of Chicago, and his student, Gilbert White. Barrows moved to Washington in 1934 to work on water issues. White followed soon after, his work in government the prelude to a career as one of the most important environmental geographers of the twentieth century. During their time in Washington, Barrows and White developed a trenchant critique of the emerging federal paradigm of protection and relief. Protective works, they held, encouraged further encroachments into flood plains because individuals and developers assumed either that existing flood protections guaranteed their safety or that flood protection works would be built to protect new development. Moreover, while such works provided security in the face of small and frequent floods, they were often overwhelmed by large and rare floods. This problem was magnified by the regime of flood control itself, which blocked upstream channels through which flood waters spread, thus intensifying flooding downstream. The perverse result was a pattern of loss-protection-loss. Flood losses stirred federal action to build protective works. These works, in turn, encouraged further flood plain encroachment and intensified downstream flooding, thus resulting in greater future losses.

During their work in the New Deal, Barrows and White formulated an alternative approach, one that was partly driven by concerns that would make White a pioneering figure in the American environmental movement. Federal flood policies aimed to control the forces of nature to meet human needs through structural modification of river basins. Such policies, Barrows and White held, dangerously neglected the limits of that control. 'Too often,' Barrows wrote in 1938, 'the habits of the rivers have been ignored…. The lure of cheap land, low rent, or other advantages has prevailed despite the fact that man cannot flout the laws of nature with impunity' (in Reuss 1992, p. 120). For White, meanwhile, the 'central flood problem' was 'how best to readjust land occupance and flood-plain phenomena in harmonious relationship?' (White 1945 [1942], p. 33). Barrows and White did not deny the value of some flood control works, but they advocated greater emphasis on adjustments in the pattern of human settlement – through measures such as land use restrictions – when such adjustments presented an economical alternative to the frenzied dam and levee building of the New Deal-era.

Costs and Benefits: Economizing Public Value

The tension between advocates of structural works and advocates of a more balanced approach that included non-structural measures ran through water policy discussions from the 1930s to the 1960s. It was particularly pronounced in debates over the formulation of benefit-cost analyses for federal flood control projects. New Deal planners had inherited from the Progressive Movement a deep faith in the ability of technical experts to make decisions about government policy in an impartial way, and they advocated using expert benefit-cost analysis to determine flood control policy. Such analysis was formally required by the 1936 Flood Act, which famously stated that the Federal Government 'should improve or participate in the improvement of navigable waters or their tributaries, including watersheds thereof, for flood-control purposes if the benefits to whomsoever they may accrue are in excess of the estimated costs'.

As benefit-cost analysis became an authoritative tool for assessing federal construction projects disputes arose concerning the proper methods and the relevant expertise for conducting such analysis. The engineers of the Army Corps and their congressional patrons – whom New Deal planners derisively called the 'pork-barrel lobby' – interpreted the 1936 Flood Act to require weighing the costs of constructing a given work against the benefits of construction. These benefits were vaguely defined in the relevant statutes and they tended to be understood in terms of broad collective values, such as a project's contribution to 'annual additional income to the nation' (Reuss 1992, p. 127). Meanwhile, for experts like Barrows and White in New Deal planning agencies – whose authority was under constant attack by the aforementioned 'pork-barrel lobby' – the Army Corps' practice of benefit-cost analysis was a prime culprit in the perverse federal approach to flood security: it failed to account for the increased losses that might result from structural protections.

Gilbert White's first published intervention in this debate was a 1936 article, 'The Limit of Economic Justification for Flood Protection.' White advanced two arguments that struck at the Army Corps' practice of benefit-cost analysis. First, White pointed out that the Army Corps' analyses tended to focus on a single protection strategy – the construction of a particular dam, for example – that was assessed by comparing it with the *absence* of protection. No attempt was made to assess the benefits and costs of *alternate* policies for reducing vulnerability to floods by comparing, for example, protective works to non-structural measures such as land-use plans. Second, White argued that the increasingly expansive definition of benefits used to evaluate flood works was not matched by an expanding definition of cost. White emphasized in particular the unaccounted cost of damage to ecological systems. 'Flood-control technicians,' he wrote, 'are giving an increasing amount of attention to the general benefits from flood protection. However, as more liberal criteria of benefits are applied, so also must equally liberal criteria of costs be taken into consideration if the weighing of the two is to be valid. It is no less important, for example, that injurious consequences of upsetting the physiographic balance in a drainage basin be evaluated, than it is that nation-wide economic effects of flood damage be measured correctly' (White 1936, p. 146).

Although White urged caution in the use of benefit-cost analysis, he did not propose to abandon it. Rather, he advocated moving away from the engineering emphasis on assessing single projects and toward a broader analysis – conceptually closer to the economics and decision-sciences of the post-World War II era – in which a full range of possible strategies for limiting the damage from floods was considered. '[F]inding the optimal use of a resource,' he argued, required 'canvassing the whole range of alternatives that are open to society, and then trying to estimate what the consequences would be, both favorable and unfavorable, of undertaking any one of those alternatives or a combination of them' (White 1993, p. 122).

White's criticism of the prevailing practices of benefit-cost analysis had little immediate impact. If anything, the problems he identified in 1936 became more acute over the next decades. As Porter (1995, p. 181) has documented, the Army Corps of Engineers 'was engaged in a perpetual effort to push back the frontiers of cost–benefit analysis so that there would always be a manageable supply of economically approved projects.' To take one striking example: benefit calculations were expanded to include the value of protecting *future* development on a flood plain. This broadened definition of benefits was given legislative sanction in the 1965 Flood Control Act that followed Hurricane Betsy. A contemporary assessment found that 'approximately half of the single-purpose flood control projects' approved by the 1965 Act 'would not have been "justified" save for the anticipated more intensive use of the flood plain… stimulated by the flood control projects' (Krutilla 1966, p. 185). In short, what White had identified as the most important argument *against* flood control projects—that they encouraged increased flood plain occupancy – was increasingly regarded as one of their most important *benefits*. The Army Corps of Engineers 'had become, despite its intentions, one of the major real estate development agencies in the country' (Hinshaw 2006, p. 140).

But even as the traditional approach to protection was expanded during the 1950s and 1960s, alternatives to federal flood control measures – and modifications to the dominant approaches to assessing these measures – were explored. The Tennessee Valley Authority elaborated the relatively new concept of floodplain management, which emphasized land use plans and local participation in flood loss reduction strategies (Wright 2000, pp. 16–19). Meanwhile, benefit-cost analysis evolved to address many of White's criticisms. Before World War II, benefit-cost analyses were generally conducted by engineers in the Army Corps and the Bureau of Reclamation; this was, as Reuss (1992, p. 103) puts it, 'economics without economists.' After World War II, professional economists, initially located in think tanks and universities, and later within federal agencies, introduced sophisticated techniques for conducting benefit-cost analyses. For example, economists at the Harvard Water Group used the new tools of systems analysis and the digital computer to 'demonstrate that dollar benefits could be counted for each purpose of development and that these could be compared with the costs of [flood control projects] with lightning speed and theoretical rigor' (Water Resources Engineers, Inc. 2006[1970], p. 517).

In one sense, these new streams of thinking and practice in the 1950s and 1960s were critical responses to existing flood security policies. They called into question established assumptions about how the benefits and costs of projects should be assessed and about who had the authority to conduct such assessments. In another sense, however, these new approaches shared core assumptions of the New Deal. They accepted the proposition that the government had a proper role in determining what land was appropriate for development, what flood protections were worth building, and which values were relevant to making such determinations. It was the job of policy-makers and technical experts, whether engineers or economists, to assess *collective* values as an aid to *collective* decision-making. These core tenets of New Deal governmental rationality were soon called into question by another wave of criticism. To understand it, we have to shift our attention from discussions of structural protections to the second pillar of federal flood policy: the provision of relief to individuals and businesses that suffer property losses in natural disasters.

Risk and Responsibility: The Moral Economy of Relief

Since the New Deal, federal relief for flood victims was largely provided in the form of low-interest loans. The volume of such loans exploded after World War II, both because losses mounted and because Congress repeatedly liberalized loan provisions. But over the same period, the loan program was persistently criticized for its cumbersome administration and for its failure to actually compensate individuals for their losses. The obvious alternative – indemnification through private insurance – was generally thought impracticable; insurance companies uniformly viewed catastrophic flooding as an uninsurable risk. For these reasons, from the 1950s to the late 1960s – when the Federal Flood Insurance Act was passed – the prospects of a government program of flood insurance was repeatedly contemplated, initially as a compliment to the longstanding federal policies of relief and protection and subsequently as a stark *alternative* to those policies.

The first thorough government investigation of flood insurance was conducted in 1955; an act of Congress that followed soon after created a Federal Flood Insurance Agency (FFIA) and charged it with arriving at a workable program for federal flood insurance. In discussions surrounding the act, insurance was seen as complementary to the longstanding federal commitment to providing flood security through loans and protective works. The text of the act observed that indemnification was 'a necessary adjunct of preventative and protective measures,' not an alternative to those measures (PL 1016 Chapter 1025). Given this focus on indemnification – and given what were thought to be overwhelming technical barriers to assessing the risk of catastrophic floods – premiums in the proposal for insurance formulated by the FFIA were 'non-actuarial and low' (Committee on Banking and Currency, U.S. Senate 1956, p. 13). They were not adjusted to reflect the risk of loss for individual properties, and total premiums were not set at a level that would cover insured losses. In sum, this system of 'insurance' was an alternative means to socialize the risk of disaster, a fact that was reflected in political debates around the FFIA proposal. It was supported by advocates of expanded and more certain government relief and opposed by those who saw relief as a form of charity that undermined individual responsibility and promoted dependency.

The opponents of insurance won the day, as Congress declined to fund FFIA proposal, and subsequent proposals stalled in congressional committees. The discussion of insurance was revived – and transformed – only in the wake of Hurricane Betsy in 1965. The Relief Act of 1965 provided funds for another study of insurance, which was initiated under the auspices of the Department of Housing and Urban Development (HUD). Simultaneously, the Bureau of the Budget convened a task force to study the flood problem, chaired by Gilbert White, who remained a leading figure in this field (Hinshaw 2006, p. 149). The understanding of insurance that emerged from these study groups was entirely different from the one previously entertained. Previously, insurance was seen as continuous with the existing paradigm of protection and relief, and was designed in such a way that made it, effectively, a *form* of relief. The study groups, by contrast, launched a broad attack on federal flood policies, and proposed insurance based on actuarial rates as a stark alternative to the existing paradigm of federal flood policy. Gilbert White's Task Force observed that relief and protection policies had 'relieved many individual flood plain occupants of responsibility, in a fiscal sense, for the consequences of their actions…. No matter how serious their encroachment on the watercourse, the occupants bear few of the costs resulting from encroachment…. The general public, by bearing all or a major part of the cost of protective works and lessening the individuals' damage costs, further subsidizes their use of the flood plain. Principles of economic efficiency and social equity thereby are violated'. Their proposal for government-backed insurance was presented as a solution to these perversities of federal flood policies. If it had been previously assumed that individuals could *not* be held responsible for their losses then insurance was a political technology for *making* individuals responsible by shifting the risks of flood damage 'to the prospective occupants [of flood plains] themselves through the imposition of mandatory, risk-related, annual occupancy charges' (Task Force on Federal Flood Control Policy 1966, p. 15).

The proposition that insurance might function to reconfigure the relationships among risk, responsibility, and security was not entirely new; it was entertained in discussions surrounding the FFIA proposal in the mid-1950s. But this use of insurance was always rejected, due to its technical difficulty (risk assessment for catastrophic floods was thought to be impossible) and its distributive effects (it would be prohibitively expensive for those most at risk). Various factors might explain why these resistances were overcome. Ever growing losses from disasters amplified concerns that the existing approach to flood security was not reducing flood damage and was becoming fiscally unsustainable, given ballooning federal expenses on relief. Advances in flood mapping and catastrophe modeling convinced some previously skeptical experts that flood insurance based on actuarially sound rates was technically feasible (Collier 2008). Moreover, broader social and cultural shifts may have swung conventional wisdom against government and toward the individual as the primary locus of risk taking and risk management. Here, however, I focus on another factor that is a complement to all of these: the formation of a new horizon of intelligibility through which the problem of flood security was understood, both as a technical challenge and as a political problem. This new horizon of intelligibility was shaped by a new economics – or, perhaps better, a new political economics – of flood security.

Public Choice and Individual Values: A New Economics of Flood Security

The last sections of this article explore this new kind of political economic reflection by focusing on the work of the economist John V. Krutilla, a central figure in discussions of flood insurance in the mid-1960s. Krutilla spent his career at the Washington, D.C. think tank Resources for the Future (RFF), which emerged as an important locus of work on water policy in the 1950s and 1960s. RFF employed a remarkable roster of experts in the field and played an expansive role in supporting major research initiatives, including projects led by Gilbert White. At White's invitation, Krutilla joined the Bureau of the Budget Flood Control Task Force as the only member – other than White himself – who did not represent a government agency (Wright 2000, p. 29). In this sense, White and Krutilla may be seen as leading intellectual architects of the federal flood insurance program. In accounting for the convergence between their views – despite evident tensions – we will be able to grasp how insurance was re-imagined as a political technology of catastrophe.

Krutilla's contribution to the discussions of flood security in the mid-1960s can be glimpsed through a background paper he wrote for White's Task Force, 'An Economic Approach to Coping with Flood Damage' (1966). The title is telling, for what Krutilla proposed was not *the* economic approach but *an alternative* economic approach to floods and flood security that diverged from the economics of the New Deal. Thus, it should be situated in terms of broader trends in economic reflection after World War II.

Since the New Deal, public interest economics rested on the proposition that market failures required government action, whether the regulation of private activities or direct interventions such as the construction of dams and levees. If government was thus made into an actor that had to make economic decisions about the allocation and management of resources, it also had to assign values to different possible courses of action through techniques like benefit-cost analysis. These assumptions were the target of sustained criticism after World War II, particularly in fields such as public choice economics and the new economics of regulation that are integral to American neoliberalism (Collier 2011). Economists in these fields pointed to the pathologies of collective decision-making processes, noting that if the market could fail then so, too, could the state. More fundamentally, they raised questions at the level of political philosophy: What values and, more fundamentally, *whose* values were relevant in making decisions? Why did technical experts (economists among them) have any special insight into collective goals? And why should collective rather than individual goals be the relevant point of reference in a liberal democracy?

Water resource management was central to these shifting discussions of public sector economics. In the New Deal, we have seen, federal flood policy was taken to be a prime example of legitimate government intervention to correct market failure, and it was perhaps the most important domain for the development of techniques to rationalize government allocation of collective resources. By the late 1950s, however, alternative ways of thinking about the economics of water resources – and, more generally, natural resources – were being formulated. Economists at Resources for the Future, where Krutilla worked, were at the center of this development. They did not dispute the prevalence of market failure in the management of natural resources. Indeed, they were convinced that with the growing scope of environmental externalities in an increasingly urban and industrial society market failures would only grow (Kneese 1988, p. 295). But they also drew attention to the inefficiencies created by government programs that were meant to correct these failures, from dam construction to pollution controls. And they argued that for both economic and ethical reasons the value of different approaches to managing natural resources were best determined either by individuals or by decision-making units that were as close as possible to individuals, such as local governments. With these concerns in mind, they invented a host of governmental devices to manage market failure without giving the Federal Government a leading role in allocating resources or in determining the value of alternative courses of action. Among these were mechanisms to shift the locus of decision-making to local government or voluntary associations, as in Vincent Ostrom's work on polycentricity, and the use of market-like mechanisms such as pollution credits to price externalities, as in Alan Kneese's work in what was later called environmental economics. Krutilla's background paper for White's Task Force raised a similar question: Was it possible for government to intervene to correct the failure of markets to provide flood security without taking up the vexatious problems of defining values and allocating resources?

Krutilla began by directly taking up the New Deal tradition of economic reflection on flood policy. In this tradition, he noted, the rationale for federal flood policy related to 'a circumstance that tends to complicate the problem of dealing effectively with flood losses,' namely, the distribution of benefits from flood control measures. Structural measures such as levees and dams, the argument went, 'will automatically and incidentally provide flood loss reduction services to all occupants of the flood plain if they are to provide such a service to any individual or subset of the occupants.' In economic terms, the 'the protection afforded is not subject to the "exclusion principle."' For public interest economics, this problem of non-excludability provided both an explanation for market failure – since no private provider of flood protection could effectively charge beneficiaries – and a rationale for government action to provide structural protections. 'The exclusion principle,' Krutilla explained:

> is a necessary condition for the conventional market to function efficiently, and where conditions for exclusion are missing the good or service takes on the attribute of a "public good" to be provided for either directly or indirectly by an agency of the public…. In short, it is commonly believed that, owing to the absence of exclusion conditions, the problem of dealing with flood losses requires public intervention. (Krutilla 1966, pp. 183–4)

But for Krutilla the conclusion of this 'common' belief did not follow from the premise. Government intervention could not be justified by simply pointing to market failure. One had to assess whether any given government measure was likely to produce outcomes that were superior to those produced by markets, and to anticipate what new problems it might introduce. In this light, Krutilla observed that federal flood security measures did not resolve the 'dissociation of costs and benefits', it merely recast it in a different form. All taxpayers shared the costs of federally funded protective works and relief measures but a small minority enjoyed the benefit. Since residents of the riskiest areas thereby received a subsidy, the government encouraged 'continued invasion' of flood plains. Moreover, although these works protected property owners from many floods, an ever-growing number of property owners were vulnerable to events that exceeded the capacity of structural works. '[A] significant part of the increase in the damage potential in urban flood plains' that had been observed in previous decades, Krutilla argued, was 'in response to the construction of work envisaged as the primary means of flood control in the 1936 legislation'. Government measures to correct one economic irrationality had created another: 'To the extent that the trend in flood plain occupance is in response to the ability to escape fiscal responsibility for the costs such encroachment entails for society a greater or more intensive use of the flood plain occurs than is warranted by the economics of flood plain locations' (Krutilla 1966, pp. 185–186; italics in original).

On one level, this argument converged with the one that Gilbert White had been insistently advancing since the 1930s. But it also converged with arguments formulated more recently by American neoliberals such as George Stigler (in his work on the economics of regulation) and James Buchanan (in his work on public choice): policies initially justified by *market* failure had proven to be significant examples of *government* failure. And in important respects Krutilla's understanding of the economic question in flood plain location was closer to post-war neoliberalism than to White's New Deal environmentalism (though in the mid-1960s White and Krutilla's positions seem to have converged). We have seen that Barrows and White proposed that a primary alternative to protective works should be 'non-structural' adjustments to floods, most importantly government-imposed restrictions on land use in parts of the flood plain whose development was determined to be uneconomical. By the 1960s land-use restrictions were accepted as key policy tool. But Krutilla cast doubts on such measures. 'From an economic viewpoint,' he argued, 'there is no reason to regard the occupance of flood plains as unwarranted.' His point was not that all occupance of flood plains was economically *warranted* but that there were no economic grounds for determining that it was either warranted or unwarranted in *collective* terms. The economic value of flood plain occupancy was not practically realized by any collectivity. It was, rather, an *individual* value that had to be determined, as he put it, for 'every possible occupant' of the flood plain.

A Smithian Solution to a Hobbesian Problem

This resolutely individual conception of value was hardly absent from discussions of benefit-cost analysis after World War II. Influenced by the New Welfare Economics, economists had recognized the theoretical importance of incorporating individual preferences into social welfare functions. Neoclassical economists had long fantasized about the ideal planner, equipped with perfect information and limitless computing power, who could replicate the efficiencies of a market. Given the task of assessing the value of flood control policies, Krutilla observed, such an omniscient planner could in principle make decisions based on 'cost and revenue relationships for every potential occupant' of a flood plain. But he found this proposition dubious. 'The acquisition of information and analysis of comparative locational advantage,' Krutilla argued, 'would be of such an order of magnitude … as to be quite unfeasible' (Krutilla 1966, p. 189). Consequently, as Buchanan (1959, p. 133) argued in a critique of the New Welfare Economics, these preferences would have to be 'presumed by the observer rather than … revealed in behavior'. Moreover, the problem was not only one of gathering and processing sufficient information about individual preferences. If different economic agents placed different value on locating in the floodplain, a single land-use restriction applied to all potential occupants could not possibly provide an economically rational way to manage the human adjustment to floods. Echoing a powerful anti-technocratic strain in American neoliberal thought, Krutilla argued that what was required was not more data, bigger computers, or more sophisticated models. Rather one needed a regulatory mechanism that achieved the public purposes of government – in this case, the provision of flood security – without imposing the same values on everyone.

Krutilla's way forward was to revisit the longstanding assumption that the benefits of flood protection were 'not subject to the exclusion principle' and that there was, consequently, no way to 'associate beneficiaries with cost-bearing.' 'On more extended thought,' he wrote, 'it is possible to simulate a condition in which all beneficiaries would be subject to the exclusion principle, as in the case of any good or service efficiently produced and distributed by means of the market.' But it required a different mechanism of security: insurance rather than land use plans or protective works. The crucial ingredient of a flood insurance program – which had been considered but ultimately rejected in prior discussions as technically unfeasible and politically unpalatable – would be premiums that were 'proportional to the risk of losses to which [each occupant of the flood plain] was subjected and to the external diseconomies his occupance occasioned for others in the community.' Such risk-rated insurance would 'confront every individual prospect for a flood plain location explicitly with the cost his flood plain location would entail' (Krutilla 1966, p. 189). The weighing of costs and benefits would be a problem for individual economic units, not a problem for government. '[D]ecentralized individual decision-making,' Krutilla concluded, would become the central mechanism for 'coping with flood plain losses and efficient flood plain use' (Krutilla 1966, p. 186). Insurance, thus, provided an alternative to *both* pillars of US flood policy: relief and protection.

It should be underscored that this was not a program for marketization in which individual choice *replaces* government action. Krutilla's entire discussion of insurance rested on the premise of market *failure*: market failure in the provision of structural protections *and* market failure in the provision of disaster insurance. In this sense, insurance was a mechanism to pursue what Krutilla accepted as a legitimate government aim – security in the face of disaster – that could not be achieved through the uncoordinated and self-interested activity of individuals. And the program discussed by Krutilla, advanced by the HUD and BoB study groups, and ultimately passed into law in 1968, involved a range of government actions to address market failures: a system of government reinsurance for private issuers of residential policies; a federal program of flood mapping and catastrophe modeling; and, later, when difficulties were encountered in implementing a voluntary program of flood insurance, measures to make the purchase of insurance mandatory. It will, of course, be noted that these were government actions of a certain kind. They did not involve allocating resources or selecting and measuring the relevant values in assessing alternative uses of land – those functions that had been so confidently taken up by government experts beginning in the New Deal. But they are government interventions nonetheless, designed to pursue public purposes through collective institutions.

To put the point in slightly different terms, for Krutilla and other reformers, insurance was a mechanism for 'framing' calculative choice in the sense of Callon (1998). Or, perhaps, it would be better to say that it was a mechanism for *re*-framing calculative choice, for it proposed to replace one economic agency (government decision-makers drawing on expert assessments) with another (autonomous individuals faced with a certain cost for insuring property at risk). If this reframing entailed a shift from an institution of collective choice to the individual, then the act of framing itself nonetheless required collective action. For individual choice in this domain had an irreducibly collective character; to borrow again from Callon, it overflowed the frame of the individual. In this sense, borrowing a phrase recently proposed by Peter Boettke (2010), we might say that Krutilla understood insurance as a Smithian solution to a Hobbesian problem.

Neoliberalism and Natural Disaster

This article began with two quotations, both written in the middle of the twentieth century. The first, from Friedrich Hayek's *Road to Serfdom*, argues that provision of relief in the wake of disasters is an appropriate role for liberal government, given that individuals cannot manage 'acts of God' that they cannot anticipate, and whose effects they cannot control. The second passage, taken from Gilbert White's seminal dissertation, argues that government policies to provide relief or protection constitute an unwarranted subsidy to individuals, foster dependence on government, and encourage uneconomical use of land. At first glance, this may seem surprising. We might not expect Hayek, a progenitor of American neoliberalism, to defend government relief; nor would we expect White, a Quaker hero of American environmentalism, to deliver a stern disquisition on how relief and protection undermine individual responsibility and discourage the efficient allocation of resources. With these disorienting points of reference in mind, this article's conclusion reflects on how the case of flood security in the USA might inform ongoing scholarly discussions of risk, security, and responsibility in contemporary societies.

In recent years, a substantial literature has argued that institutions of economic and social security associated with the rise of the welfare state – particularly, in the US context, those introduced during the New Deal – have been undermined by policies that refocused the provision of security and the management of risk on individuals. Jacob Hacker, thus, has recently written of a 'great risk shift' that involves a 'massive transfer of economic risk from broad structures of insurance, including those sponsored by the corporate sector as well as by government, onto the fragile balance sheets of … families'. Institutions of risk pooling created during the New Deal, he argues, have been left 'in tatters' due to economic changes and a sustained conservative challenge (Hacker 2006, p. 6). For many scholars, this development is linked to neoliberal criticism of the welfare state and efforts to establish market principles of calculative choice in domains previously assigned to government. As Richard Ericson and Aaron Doyle (2004, p. 60) argue, '[t]oo much protection organized by paternalistic institutions is no longer seen as a public good but a corrosive bad. Individuals must assume responsibility for their well-being.'

Insurance has been one focal point of this scholarship about the changing dynamics of risk and security. By its very nature, insurance is a mechanism for socializing and distributing risk. But depending on its technical characteristics, insurance can also *individualize* risk (Lehtonen & Liukko 2011). Thus, Ericson *et al*. (2000, p. 534) observe 'a tendency in insurance which has become increasingly pronounced in the era of neoliberalism' toward 'more and more risk segmentation or the unpooling of risks.' Either through the exclusion of high-risk groups or through the adjustment of premiums to individual risks, insurance may thus serve as a mechanism to produce a 'neoliberal citizen' – contrasted, in this account, to the 'social citizen' of the welfare state – who 'is to deal with the uncertainties of life by embracing risk, prudence, and investment' (Ericson & Doyle 2004, p. 290).

On one level, the preceding account of US flood policy fits this familiar story rather well. Government interventions designed during the New Deal to provide 'public goods' were, indeed, subsequently criticized as 'corrosive bads' due to their paternalism and their unintended consequences. Mechanisms of security that socialized risk were indeed replaced (at least in part) by policies that constitute the individual citizen as a risk-taking agent who is responsible for his or her own security. And advocates of flood insurance did indeed cast doubt on government policies enacted in the public interest, and insisted that the relevant values in governing are not those of some mystical collectivity but of the individuals on whose consent the legitimacy of liberal government purportedly rests.

At the same time, the preceding account suggests a provocative challenge to this familiar story. This is not a case in which a coherent New Deal liberalism is replaced by a coherent neoliberalism. Instead, we find a more complex layering of problems, events, styles of thinking, and political positions that scrambles many familiar categories and distinctions. We have seen that Harlan Barrows and Gilbert White's critiques of collectivist policies originated from within the New Deal itself. Moreover, the 'neoliberal' critique of New Deal flood security policies did not reject the argument that market failure was a problem that had to be addressed through some kind of collective action to provide security in the face of natural disasters. Indeed, insurance was proposed, in part, as a more reliable and complete form of security. And insurance was championed by proponents of causes that are never associated with neoliberalism, such as the environmentalism of Gilbert White and the economists at Resources for the Future, and John Krutilla's anti-technocratic positions.

One point that emerges from this story is that we cannot reliably locate neoliberalism at a single point on the political map. How, indeed, would one arrange the very different 'neoliberal' positions of Friedrich Hayek, John Krutilla and (implausibly!) Gilbert White, on our taken-for-granted understanding of the political spectrum: one pole opposed to government involvement, unsympathetic to the need for collective security measures, and insistent on individual responsibility; the other pole sympathetic to broad government intervention and expansive security measures, and insensitive to the economic effects of such measures. More profoundly, this story presents a case in which neoliberalism transforms the topology of the political map itself.[3] In this domain, the neoliberal proposal for insurance did not merely aim to shift risk from collective security institutions to individuals. Rather, by formulating new kinds of reflection on governmental practice, and advancing proposals for reformulating that practice, neoliberalism modified the *possible* accommodations and articulations among risk, security, and responsibility.

Coda

In the decades after the US Congress created the National Flood Insurance Program (NFIP) in 1968 its effects were muted. The absence of a coverage mandate – addressed only in part by subsequent reforms – meant that few homeowners carried insurance. Provisions to keep rates low, particularly for structures built before 1968, meant that premiums were far below 'actuarial' levels. Thus, the government continued to subsidize settlement in flood-prone areas, now through insurance rather than through structural protections or relief. This arrangement was increasingly called into question in the 1990s and 2000s as a series of disasters – most notably Hurricane Katrina in 2005, the costliest disaster in US history – overwhelmed the NFIP, which had to be bailed out. Adjustments to the program were enacted with the passage of the Biggert-Waters Flood Insurance Reform Act in July 2012. Among other things, insurance premiums were mandated to quickly rise to a level that reflects the risk of flood loss.

The Biggert-Waters Act garnered little opposition. In an otherwise gridlocked US legislature it sailed through the US Senate and House of Representatives (on votes of 74–19 and 373–52, respectively). But its provisions were soon subject to intense scrutiny. Only three months after the Act's passage, Hurricane Sandy inundated coastal New York, New Jersey, and Connecticut. Thanks to the reforms, and to revised flood maps that included an additional 65,000 properties in the high-risk flood zone, homeowners who had to rebuild or repair their homes faced difficult choices. They could undertake expensive modifications (such as elevating their houses), pay dramatically higher insurance rates (as much as $31,000 per year), or simply move somewhere else. Inevitably, acrimonious debates have sprung up around this new calculus of choice. Some charge that actuarial rates will make flood-prone coastal areas unaffordable for all but the very rich. A curious but by now not unfamiliar coalition of environmentalists, libertarian reformers, and insurance industry lobbyists counter that subsidized rates already benefit rich residents of coastal areas at the expense of those living elsewhere; higher rates merely remove an unwarranted and unjust subsidy. The reformed insurance provisions also raised new questions about individual responsibility in the face of catastrophe. If Sandy was the harbinger of a climate-changed future, as most assume it was, could homeowners be held responsible for past decisions to live in areas in which the risk of future catastrophe has only recently been understood and is in any case uncertain and changing? Might insurance become the key *collective* mechanism used to force *individuals* to take responsibility for their relationship to a future defined by climate change?

These are questions and problems that catastrophe insurance renders intelligible, makes available, and, perhaps, makes unavoidable. They are hardly specific to the United States. Today proposals for catastrophe insurance are proliferating, from European discussions of expanded disaster insurance following floods in June 2013, to innumerable experiments with index-based 'micro-insurance' (Abdo and Boeckler 2013), to broad programmatic visions of insurance as a key instrument of development in poor countries, as in the World Bank's 2014 World Development Report. Quietly, and in many cases without significant debate, this mechanism for governing catastrophe promises to reshape our political and moral landscape.

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NOTES

1. This is a moment of reflexive modernization in Beck's (1992) sense: modernity becomes its own problem and theme.

2. Callon defines economization as the way that 'things, behaviors, and processes become economic.' Just as there are many different kinds of economics, there are different forms of economization. The accent is placed not only on whether things are economized but also on what kind of economization is in question (Caliskan & Callon 2009).
3. The notion of 'topology' I have in mind is explored in Collier (2009).

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