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From flood safety to risk management

The rise and demise of engineers in the Netherlands and the United States?

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5. From levees to insurance: The spatial turn in US flood governance^{*}

Abstract

This chapter focuses on the turn to a spatial planning approach in US flood governance. It investigates the role of experts in forming and shaping this turn and reconstructs the policymaking process in different phases of this turn to analyze the impacts of expert-influence on distributive decision-making. Three conclusions are drawn. First, expert-influence in this process should be understood as the product of the self-organization of expert-groups combined with larger-scale political-contextual factors that set boundaries around what expertise was considered relevant in US flood governance. Second, while experts greatly influenced the development of spatial planning measures in US flood governance, their involvement did not reduce attention to the distributive implications of spatial planning policies. On the contrary, they contributed to a better understanding of the distributive implications of spatial planning measures by specifying the costs involved with these measures for different groups in society. Third, the chapter also demonstrates that with the institutionalization of spatial planning measures in US flood governance, a new type of “operational” expert was created, which placed the emphasis of US flood governance on operational effectiveness over and above the distributive aspects of spatial planning policies.

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5.1 Introduction

This chapter investigates the relationship between experts and policymakers in 20th century US flood governance, during which a transition was made from a “safety” to a new “spatial planning” approach. The aim is to analyze the role of experts in this policy turn and the effects of their influence on distributive decision-making (which deals with the allocation of costs and responsibilities in flood governance) underlying this turn. What experts were involved in this turn, what was their influence on the development of the policy discourse on floods, and how have they, through this, influenced the distributive aspects of the spatial planning solutions devised in US flood governance?

In the US, the spatial planning approach was officially implemented in the 1960s. However, in order to fully grasp this policy turn, this chapter analyzes its emergence against the background of the safety approach that dominated US flood governance in the first decades of the 20th century and considers its institutionalization over the last decades of the 20th century. The analysis is structured along different stages in this process. For each of these stages, the main policy developments have been mapped out based on an examination of (scientific and policy) literature on US flood governance. To analyze the role of experts and the effects of their influence on distributive decision-making in these stages, the analysis zooms in on several moments in the policymaking process during which key distributive decisions were made. Transcripts of Congressional debates and Congressional committee hearings were used to understand how expert-knowledge fed into the policymaking process and shaped the understanding and consideration of the distributive choices underlying spatial planning measures.

The chapter is structured as follows. Section 5.2 briefly sketches the emergence and partial institutionalization of the safety approach in US flood governance in the early decades of the 20th century. Section 5.3 describes how, from the 1930s

onward, this safety approach was challenged and changed by a new “spatial planning” discourse on floods, which was formalized into policy in the late 1960s. Section 5.4 covers the gradual institutionalization of this approach in US flood governance over time, up to the start of the 21st century. Section 5.5 discusses the role of experts in the turn to spatial planning measures in US flood governance. The conclusion reflects on the influence of these experts on distributive decision-making underlying this turn.

5.2 The engineers’ era (1900-1920)

Just like in the Netherlands, the first centralization tendencies in US flood governance emerged at the start of the 20th century (Wright 2000). Up to the 1900s, it was left to local communities and states to fund flood protection and bear the costs of flood damage. Motivated by overseas successes in the construction of the Panama Canal—a Saint-Simonian inspired project that was started by the French in 1881 but taken over by the US Army Corps of Engineers in 1904, under whose management the canal was finished below budget and two years ahead of schedule—Army Corps engineers started to develop plans to control domestic rivers as well. Most of these plans targeted the Mississippi delta, which developed as an important economic growth region of the country.

At first, the plans of the Army Corps aimed to improve the Mississippi’s function as a navigational route for commercial shipping, because at that time, the federal government was only allowed to invest in “internal” state affairs when these investments benefited the national economy (Layton 1986). The growing role of the Army Corps threatened the position of independent “civil engineers” who used to provide their services to government. In an effort to reground the status of their expertise, these civil engineers started to organize themselves into associations through which they developed engineering plans for the public good. This provided a great boost to the engineering profession. The number of engineers in US society rose from 7,000 in 1880 to 226,000 in 1930 (Barry 1997:

290). Involved in an open competition for federal funding, civil and Army Corps engineers now openly criticized each other's plans (see Barry 1997 for a vibrant description of this rivalry). In this competition, engineers increasingly emphasized flood protection as an additional benefit of their plans (Tarlock 2012).

In 1917, the federal government for the first time allocated funds specifically to flood control. Limited in scope to the Mississippi and Sacramento Rivers, the 1917 Flood Control Act arranged that for every one dollar spent on flood protection by "local interests," the federal government would pay at least two (Arnold 1988: 14). After devastating Mississippi floods in 1927, a new Flood Control Act was adopted in 1928 that authorized one of the largest flood protection projects ever undertaken in the lower Mississippi valley. This time, no local contributions were required at all (Barry 1997).

Under the leadership of engineers, the federal government became increasingly involved in flood protection in the first decades of the 20th century. This growing federal role in local state affairs met with resistance. It clashed with dominant US political values, like local autonomy and individual responsibility. However, there was no available alternative to controlling floods at that time.

5.3 The emergence of a spatial planning approach

5.3.1 The geographer's floodplain management approach (1930-1950)

Federal investments in flood control were reinforced under Franklin D. Roosevelt's New Deal Administration, which launched a series of state projects to tackle rising unemployment levels during the Great Depression in the 1930s (Wright 2000). Water management proved conducive to this interventionist approach; flood protection became unaffordable for local communities during the economic recession, and federally-funded flood control projects created much-needed jobs (Macdonald et al. 2012). In 1936, over \$310 million was

appropriated to subsidize 250 different flood control projects throughout the nation (Wright 2000: 11).

Roosevelt's interventionist regime was a key topic of concern for social scientists connected to the Chicago school of behavioral sciences. Set up by professor Charles E. Merriam as a Social Sciences Research Council at the University of Chicago in 1929, this school worked with a rational-actor perspective to explore the opportunities for adjusting "negative" and promoting "rational" or "wise" behavioral patterns through governmental incentives, which according to its members often provided a cost-efficient alternative to direct governmental interventions (Simon 1985). Within this Chicago school, geographers developed a particular interest in natural resource management. Led by professor Harlan H. Barrows of the university's geography department, this group studied the use of natural resources and accentuated spatial planning interventions to improve natural resource management (Macdonald et al. 2012). The increased role of the federal government in flood control, which was accompanied by growing federal expenditures on disaster relief, was a mounting concern, especially for these geographers. With Congress willing to fund flood control projects to create employment, these geographers considered it their mission to develop a method to better weigh the costs of flood protection against its benefits.

Members of the Chicago school developed close ties with Roosevelt's administration, which took a great interest in natural resource management as a means to combine the multiple policy goals (e.g., job creation, resource stability, and environmental improvement, cf. Reuss 1992). Both Merriam and Barrows held a position on the Roosevelt administration's National Planning Board that was established within the department of Public Works (Hinshaw 2006: 15). When Barrows was made part of a Water Resources Committee that was formed within this planning board, his work provided a notable exception to the engineering focus displayed by this committee. In a 1936 report, the engineers on

this committee called for the construction of more levees, river outlets, and reservoirs to prevent floods. Barrows, however, called for a spatial planning approach to floods, through which people would be guided away from high-risk areas to minimize the impacts of floods. He argued that “[i]f it would cost more to build reservoir storage than to prevent floodplain encroachment, all relevant factors considered, the latter procedure would appear to be the better solution” (Barrows 1936, cited in Reuss 1992: 116). This chapter laid out the beginning of the geographical approach to flood governance.

Barrows’s ideas were further elaborated by his student, Gilbert F. White. In his PhD thesis titled “The Human Adjustment to Floods”, White (1945) argued that levees and other protection measures could in principle be an effective way to reduce flood losses, but not in all areas. Particularly in medium- to low-risk areas, the costs of investing in flood protection did not outweigh the benefits gained by the development of protected areas. However, in White’s view, such rational considerations about floodplain development were obstructed by the existing policy framework in which the Federal government assumed large parts of the costs of flood protection and damage compensation. Under the protective wings of the central state, people continued developing flood-prone areas, and there was no incentive to take the potential costs of flood damage into account in their building choices (White 1945: 210-211). In his thesis, White (1945: 34) therefore called for a “geographical approach” to flood risk management, in which federal floodplain regulations and price incentives would be used to encourage an optimal use of the country’s floodplains.

The ideas of Barrows and White proved influential. They were embraced in a number of significant publications on water management in the 1950s and adopted by key scientists in this field (Macdonald et al. 2012). They were also taken to practice. In the Tennessee River basin, economic profits did not justify high investments in flood protection. The Tennessee Valley Authority (TVA), one

of Roosevelt's federal agencies, started to experiment with White's approach, which they coined "floodplain management" (Cigler and Burby 1990). The TVA conducted a large number of studies that greatly improved methods for the collection of local flood hazard data and the use of land-use regulations to guide building activities in floodplains. The TVA distributed over 200 research reports between 1950 and 1970, further advocating the idea of floodplain management (Wright 2000: 20). Together with the active advocacy of Barrows and White during public manifestations and governmental meetings, the idea of floodplain management gradually became part of standard discussions in US flood governance (Hinshaw 2006). At the local level, there was resistance to floodplain management. Local states and communities feared that federally imposed land-use regulations would restrict their autonomy and impair their economies. But such concerns were usually suppressed by the active voices of supporters of the floodplain management approach who entered the public debate every time a flood struck to discredit the excessive federal bailouts the existing policy approach indulged.

5.3.2 Political acceptance of flood insurance (1960-1970)

Growing urbanization in the 1950s and 1960s accelerated floodplain development. More levees were built to protect these growing settlements (Wright 2000). Despite these efforts, flood damage rose steadily in this period and the federal government increasingly had step in and provide disaster relief to help victims rebuild after a flood. Increasingly, calls were made to launch a federal insurance scheme for flood damage. After the big Mississippi floods of 1927, private insurers had stopped covering flood damage, which left US citizens dependent upon their federal government for damage compensation. While in 1956 a bill was adopted to establish a federal flood insurance scheme, this scheme was never implemented; it was held back because of the difficulty of calculating accurate premiums because of the low probability and catastrophic

nature of flood risks. The emergent policy philosophy on floodplain management in the 1960s initiated a renewed interest in federal flood insurance.

Links between insurance and floodplain management were apparent in the work of two task forces on federal flood control that were set up by president Lyndon B. Johnson in the wake of the destructive floods caused by hurricane Betsy in 1965. The first task force was set up within the Federal Department of Housing and Urban Development (HUD). The report criticized existing flood management strategies. Flood protection and federal disaster aid not only created public expectations for federal assistance after floods, but it also undermined rational floodplain management choices that could help to prevent damage in the event of a flood. According to the HUD task force, a more viable alternative would be a “self-help” insurance program that would address the responsibilities of floodplain occupants in mitigating flood damage (HUD 1966:12). However, the authors realized that the actuarial rates the private insurance industry would have to charge to underwrite the assumed risk would make flood insurance unaffordable for people living in high-risk areas. Therefore, the authors recommended the setup of a federal insurance program in which the federal government would ensure premiums remained affordable by acting as a reinsurer (lender of last resort) for catastrophic losses and by subsidizing premiums of people living in high-risk areas.

White was contracted to chair the second task force. He brought in James Goddard, a central spokesman of TVA, and both men handpicked the other members of the task force. In their report titled “A Unified National Program for Managing Flood Losses,” the floodplain management vision was clearly present. The authors claimed that while the “[u]se of flood plains involving periodic damage from floods is not, in itself, a sign of unwarranted or inefficient development [...] [p]rinciples of national economic efficiency require, however, that the benefits of flood plain occupancy exceed all associated costs” (Task Force

on Federal Flood Control Policy 1966: 13-14). Existing policies were criticized for relieving “individual flood plain occupants of responsibility, in a fiscal sense, for the consequences of their actions” while the “general public, by bearing all or a major part of the cost of flood protection works and lessening the individuals’ damage costs, further subsidizes their use of the flood plain” (idem.: 15). According to the authors, a more effective approach would be to alter the price signals received by potential floodplain developers, for example in the form of a risk-related “occupancy charge” (idem.: 16). In addition, land-use requirements could be used to prohibit developments in the most hazardous areas. Offering subsidized premiums in a federally supported insurance program as the HUD task force proposed could be counterproductive, White’s task force argued, as this would encourage uneconomical developments in the nation’s most hazardous floodplains.

When the reports of both task forces were discussed in Congress, the limits of engineered flood protection were emphasized as well. Presented with an alternative to engineering solutions in flood governance, a member of Congress stated that “[e]ngineers admit, as competent as they may be, that they cannot provide complete protection for every flood” (House of Representatives, 1967a: 1096). Federal disaster relief programs were criticized. This form of aid was not only given on a “piecemeal disaster-by-disaster basis,” but it also provided floodplain occupants with a guarantee for damage compensation without appropriate responsibilities attached to that (90 Cong. Rec. 30791, 1967). Insurance was generally accepted as a viable alternative. As one representative put it, insurance is, “in the finest American tradition, helping the citizen to help himself in anticipation of a potential disaster” (90 Cong. Rec. 30807, 1967). Besides, that insurance would discourage unwise developments in floodplains and help to reduce flood losses was underlined as an important benefit as well (Subcommittee on Housing 1967: 4-5).

However, worries arose about the affordability of flood insurance. As the HUD report already indicated, insurance premiums were deemed unaffordable for people living in high-risk areas. While White's task force cautioned against the use of subsidized rates for undermining damage mitigation incentives, Congress shared the concerns about affordability with the HUD task force (House of Representatives, 1967b: 17279). When the National Flood Insurance Program (NFIP) was enacted in 1968, Congress decided to subsidize the insurance premiums of properties located in high-risk areas to ensure their owners had access to reasonably priced damage compensation. Full-risk rates would be charged to new developments or substantially damaged structures in these areas in order to discourage the further development of floodplains. In addition, it was decided to only offer flood insurance in communities that had enacted certain minimum land-use regulations that prohibited building activities in their floodplains. The need for subsidization was thought to be greatest in the first operating years of the program, when a level ranging from 66 to 75 percent was believed necessary (House Committee on Banking and Currency 1967: 40, Subcommittee on Securities 1967a: 81). However, a HUD spokesman assured Congress that "[a]s the program develops and homeowners in less hazardous zones begin buying insurance, or as new or substantially improved properties come in, the Government's share of the risk will decline" (Subcommittee on Housing, 1967: 15), an argument that was also made by the private insurance industry (Subcommittee on Securities 1967a: 81).

The NFIP was set up as a privately run but federally backed insurance scheme. Its implementation was left to private insurers who had organized themselves into a National Flood Insurance Association (NFIA). Premium revenues were collected in a common National Flood Insurance Fund, which was backed by federal resources; in case of catastrophic losses, this fund could borrow from the national treasury to cover claims. Oversight and management responsibilities for the NFIP were placed under the auspices of the HUD department.

With the National Flood Insurance Program, Congress embraced the principles of rational floodplain management. However, it traded off its call for risk-based pricing as an effective flood damage mitigation strategy with concerns about costs this would infer on local-level actors living in high-risk areas. This trade-off resulted in the choice to federally subsidize insurance premiums in these areas.

5.4 The institutionalization of the spatial planning approach over time

5.4.1 Growing federal involvement under environmentalism (1970-1980)

In the first operating year of the NFIP, only four communities enrolled and only 20 insurance policies were sold (Platt 1999). In the years thereafter, participation also fell short of expectations. Mapping delays formed an important part of the problem. When the program started out in 1968, HUD was given the gigantic task of mapping all flood hazard areas in the nation. However, data on local flood risks was not readily available and HUD had to collect this while the program was already in operation. Using the standard of a “1:100 flood” already applied by the TVA—which denoted a flood event that had a statistical chance of recurring once every hundred years—HUD used historical flood data to identify flood hazard areas in each community, which it correlated to insurance premiums in Flood Insurance Rate Maps (FIRMs). As communities could only enter the program once HUD had published their FIRM, mapping delays slowed down community participation.

In 1969, an Emergency Phase was introduced that allowed communities to enter the program based on Flood Hazard Boundary Maps, which were less detailed than FIRMs, as they only showed floodway boundaries and provided no information about flood depths (Riebau 2000). Because these boundary maps provided little information to support actuarial (risk-based) rate calculations, insurance was offered against subsidized rates and little to no land-use

regulations were required from local communities' planning departments. While this Emergency Phase boosted participation in the program, this practice was also criticized, for it not only increased federal subsidization in the program but also undermined the program's original damage mitigation goals.

Despite all these struggles, political support for the program was upheld in the 1970s. This was mainly because of the strategic interlinkages between environmental organizations and supporters of the floodplain management approach. The environmentalists' goal of protecting natural areas against economic claims on land coincided well with the purpose of the insurance program to prevent developments in natural floodplains. Influential environmental NGOs such as the Wetlands Organization started to support the NFIP as a tool for environmental planning. In 1975, a new task force on floodplain management was set up at the geography department of Georgia State University. This task force, later renamed the Water Resources Council, included representatives of several federal departments and agencies, including the 1970-established Environmental Protection Agency, HUD, and TVA, whose work knitted together flood safety and environmental goals through land-use management. It was an active group. Members met every six weeks, special working groups more often (Wright 2000). The Water Resources Council produced several reports with guidelines to help communities and individuals meet the NFIP's building and zoning requirements for damage mitigation (US Water Resources Council 1969, 1971).

In policy discussions on the NFIP, the new focus on land-use planning was reflected as well. This was instigated by HUD administrators, who on several occasions proposed to add new rules to the NFIP's regulatory structure to strengthen its land-use planning component. In 1973, HUD, for example, proposed to require of communities that received disaster assistance after a flood a strengthening of their building and zoning regulations in the affected

areas (Subcommittee on Housing and Urban Affairs 1973: 16). HUD also proposed to make flood insurance a mandatory precondition for receiving federal loans and grants for building in high-risk areas. These proposals elicited concerns from local communities. As the National Association of Counties pointed out during a hearing in 1973, “the whole economy is built upon retirement, land development, and building, all taking place within the so-called flood plain”; if insurance and land-use planning was required in these areas, they would become “unusable because of the forced zoning elevations”, bringing “economic disaster” to those areas (idem.: 85). Congress members also started raising questions about the costs of insurance and rebuilding to NFIP standards at the local level (idem.: 47-49, 69-70). However, HUD continued to stress the importance of land-use planning in the operation of the program. In addition, the organization pointed out that existing structures in high-risk areas would continue to be subsidized. As the administrator of the program at HUD explained: “I don’t envision the program becoming self-supporting for many, many years. We are talking about a very, very long-range effect [...] [T]his bill was not structured to make the program self-supporting in the near future. It was structured to get construction on the right road” (idem.: 47).

As a result of these discussions, several measures were introduced to strengthen the program’s building and zoning requirements (Arnell 1984). A 1973 reform package placed a mandatory purchase requirement for flood insurance on all federally-backed properties in high-risk areas in participating communities to extend the reach of its building requirements. These reforms also required of these communities an assurance that 1:100 floods could be accommodated in their floodplains without water levels rising more than one foot at any point (ASFPM 2004). To help individuals and communities meet NFIP building and zoning standards, the Water Resources Council continuously revised its guidelines for flood damage mitigation, which were adopted as executive orders and brought under the statutory framework of the NFIP (US Water Resources Council

1971, 1979). In this period, the federal government also started to financially assist individuals and communities through loss reduction and damage mitigation grants. To balance these stricter land-use requirements imposed by the NFIP and further increase participation, the Emergency Phase was extended and subsidized rates were lowered several times between 1972 and 1974.

As a result of these measures, community participation increased from 158 in 1971 to 15,000 in 1977 (Platt 1986: 56). However, many insurance policies were sold against subsidized rates. This stirred up a conflict between HUD and the NFIA, the collective of private insurers involved in the program. The NFIA refused to provide HUD access to historical claim data, because of which it remained unclear what percentage of the rate charged by private insurers was actually subsidized (NFIA 1977). This breakdown of trust led to a government takeover of the program in 1977 (Subcommittee on Housing 1977). While private insurers continued to be involved in the program as sell and service agents, this decision in effect transformed the program into a fully federal enterprise supervised by HUD. As a consequence of this government takeover, premiums were no longer federally “subsidized”, but simply included as “discounted” rates in the general program budget, where they should have been compensated for by the revenue generated by received premiums.

As a result of the collaborative efforts of social geographers and environmentalists in the 1970s, land-use planning was highlighted as a policy goal for the NFIP. In policy discussions of the NFIP, this goal was evaluated against the costs involved with stricter land-use requirements in high-risk communities, where large parts of the nation’s economic activity clustered. The trade-off that resulted expanded the federal government’s role in the program. The federal government used the NFIP to impose land-use regulations on local communities, and at the same time, it assumed a greater part of the risk by allowing communities to enter the program against subsidized, and later discounted, rates.

5.4.2 A liberal turn (1980-1990)

In the 1980s, under the Reagan Administration (1981-1989), market regulation became the cornerstone of public policymaking. This political change affected the flood insurance program as well. In 1979, management responsibilities for the NFIP were transferred from HUD to the Federal Emergency Management Agency (FEMA), a regulatory agency created to improve the coordination and effectiveness of US disaster management. In 1981, Reagan stopped financing the Water Resources Council, thereby effectively ending an important communication channel between federal government and social geographers that had always been closely involved in the development of the program. While NFIP participation steadily grew, the balance of the National Flood Insurance Fund ranged between negative \$5.4 million and negative \$323 million between 1972 and 1980, and HUD regularly had to borrow from the treasury to pay out damage claims (Pasterick 2000: 191). Resistance against this state-led and state-subsidized program increased.

When the operation of the NFIP was discussed in the 1980s, it was seen as problematic. Contrary to its intentions, the program had failed to prevent development along the coast and reduce federal disaster assistance. As a senator stressed, “[i]t was through the insurance premium that the program would transfer a substantial portion of flood-related costs borne by taxpayers to those who lived in the flood-prone areas. Through this mechanism, it was envisioned that the program would eventually become self-sustaining. But today, that is not the case. The facts show that the subsidies have been increasing” (Committee on Appropriations, 1981: 4). To aid this situation, the Reagan Administration called on FEMA to cut back subsidies to pre-1972 levels (*idem.*: 2).

In 1981, FEMA promulgated a new goal for the NFIP, that is, to be self-supportive for the average loss year. This average loss year was calculated as the annual average of losses experienced in the operational history of the program (*i.e.*,

since 1968), and self-supportiveness entailed that the total sum of annual premiums equaled the annual average loss. To meet this goal, FEMA increased subsidized premiums ten times between 1983 and 1995 (Pasterick 2000: 189). Pressured to end the Emergency Phase but provided with no additional resources to map local flood hazards, FEMA decided to reissue the boundary maps of communities with a low-growth potential as FIRMs in order to transfer these communities to the regular program (Riebau 2000).

In the 1980s, the NFIP's operation was viewed in a different light. Subsidized premiums were no longer seen as a legitimate trade-off, used to spread the costs and benefits of the program over the nation. Rather, with a political regime that sought to limit federal involvement in the public domain, subsidized rates came to be seen as unjustifiable elements in a market-based program. Several measures were taken to reduce federal subsidies in the program. These measures had their effect. In 1986, the program was "self-supportive" for the first time. While subsidized premiums were never eliminated from the program, in that year premium revenues equaled historical annual losses.

5.4.3 Operational mode (1990-2005)

Climate change entered the international flood governance discourse in the 1990s. Floods were projected to become more structural and more devastating. National and international flood governance approaches responded to these new flood risks by adapting to, rather than building against, floods (Butler and Pidgeon 2011, Hartzell-Nichols 2014). It could be expected that the NFIP, with its emphasis on flood hazard mitigation, gained importance as a response strategy to climate change. But while the insurance scheme drew the attention of international scholars working on climate change (e.g., De Moel et al. 2009, Aerts and Botzen 2011), domestic interest in the NFIP declined toward the turn of the century. Within FEMA, floods now "competed" with other emergencies, such as international security and terrorism. Moreover, the self-supportive status upheld

by FEMA in this period generated the expectation that the program worked fine, that it would be able to cover all claims when a flood would occur.

The NFIP's operation between 1990 and 2005 has been characterized as being in a "maintenance mode" (Riebau 2000: 171). Suffering from a persistent lack of funding, flood maps were only updated when they were challenged by property owners or when new information was provided to FEMA by insurance agents or local governments. While amendments to the program aimed to improve incentives for flood damage mitigation—for example, through the 1990 Community Rating System that provided premium discounts in communities that enacted more stringent land-use regulations than minimally required by the NFIP—in practice such provisions were little utilized and difficult to monitor (Wright 2000).

This relatively calm and steady road in the development of the NFIP was quite suddenly interrupted by hurricane Katrina, which struck the US Gulf Coast in 2005. For the first time in 19 years, the program lost its self-supportive status. After paying out all claims of the 2005 hurricane season, the program was left with a \$19 billion debt to the national treasury that nobody thought could ever be repaid (Michel-Kerjan et al. 2012). The event elicited a long line of policy discussions on the operation of the NFIP and its feasibility as a flood management strategy altogether, which will be described in the next chapter.

5.5 Expert-influence in the US turn to spatial planning measures

This chapter traced back the influence of experts on the transition from a safety to a spatial planning approach in US flood governance. The aim was to analyze the extent to which and way in which experts, through their interaction with policymakers, shaped the common policy discourse on floods and how this impacted the recognition and handling of distributive aspects in the policymaking process. In this section, conclusions will be drawn with respect to the role of

experts; what experts were involved and how was their influence constituted in US flood governance?

The historical reconstruction provided in this chapter first of all demonstrates that expert-groups were extensively involved in all stages of the evolution of US flood governance in the 20th century. However, in contrast to the Netherlands, where engineers formed the dominant source of expertise in flood governance throughout the 20th century, in the US different expert-groups were involved at different times. While the first efforts to control floods were led by engineers, “spatial” experts took over this role in the 1930s and “operational” experts have guided US flood governance since the 1980s.

Partly, this variety can be explained from the organizational efforts of expert-groups themselves. Drawing on their successful intervention in the construction of the Panama Canal, engineers actively advocated their technical-engineering solutions to floods in the early decades of the 20th century. The public scuffles between “Army Corps” and “civil” engineers in the early decades of the 20th century contributed to the recognition of engineering expertise in the policy domain. However, in the 1940s to 1960s, a new group of experts organized itself in the domain of flood governance. Affiliated with the influential Chicago school of behavioral sciences, social geographers openly challenged the technical solutions forwarded by engineers and instead presented their “floodplain management” approach as a better (more cost-efficient) alternative.

At the same time, this chapter also highlights the importance of political-contextual factors in understanding the constitution of expert-influence in US flood governance. Engineering solutions never really landed in the political landscape of the US. The engineers’ perception of floods as a collective problem that required a federal response clashed with dominant American political values, such as local autonomy and individual responsibility. When Roosevelt started to use flood control projects as part of his job-creation plans, this motivated social

geographers to develop an alternative approach to flood governance. Their rational floodplain management alternative corresponded much better to American political values. These social geographers framed floods as a problem of individual location choice for which not the central state but local communities and individuals should bear responsibilities and costs. Especially after the Roosevelt regime, close bonds developed between social geographers and policymakers. Gradually, engineers were “organized out” of the policymaking process whereas social geographers were “organized in”. Under this merger of knowledge and interests, a strong policy frame was created that generated the necessary support for the adoption of the geographers’ rational floodplain management approach. In 1968, this approach was formalized in the NFIP.

In addition, this chapter also demonstrated that changes in the political context over time opened up space for the emergence of new expert-groups in US flood governance. For example, experts connected to the upcoming environmentalist movement in the 1970s, whose aim to prevent floodplain development overlapped with the aims of floodplain management, upheld general support for the NFIP during its first cumbersome years. To address low participation and mapping delays, the federal government even expanded its role in the insurance program in this period. However, this increased federal interference in the program backlashed against the rise of political neo-liberalism in the 1980s. Its ideology of market regulation conflicted with the idea of a federally supported insurance program. Under the Reagan regime, a new type of expert was “organized” in US flood governance: the operational expert. Management responsibilities for the NFIP were transferred from the federal government to the independent regulatory agency FEMA, and the policy goal shifted from land-use planning to fiscal independence in this period.

Based on these insights, this chapter concludes that despite the efforts of expert-groups themselves to get their expertise recognized in US flood governance,

dominant political values set boundaries around the type of expertise that was considered relevant for policymaking on floods. Expert-influence in US flood governance can thus best be understood as “contextually embedded” in the larger political context of the US, which limited the space of and set ground rules for expert-groups to organize their expertise in the domain of flood governance. From this contextually embedded understanding of expert-influence, it can also be understood why in certain periods certain expert-groups dominated in US flood governance.

5.6 The effects of expert-influence on distributive decision-making

The previous section analyzed how expert-influence was constituted in 20th century US flood governance. This section reflects on the extent to which and the way in which expert-groups influenced the policy discourse on floods, and through this the distributive aspects of the flood insurance policy that constituted the US spatial planning approach to floods.

The previous section described the influence of social geographers, who stood at the basis of the spatial planning approach in US flood governance, as contextually embedded in the larger political context. This embedded character meant that social geographers developed close relationships with policymakers. The reconstructions of the policymaking process in US flood governance show that through the interactions between social geographers and policymakers, a “strong” policy frame developed that provided a coherent story about the problem of floods. In this policy frame, the cause was identified (i.e., the human “encroachment” of floodplains) and a solution was outlined (price incentives for rational floodplain management). In this policy frame, operational and normative arguments closely interlinked.

While social geographers greatly influenced the normative aspects of the US spatial planning approach to floods, this chapter also demonstrates that the

distributive impacts of this spatial planning approach were recognized in the policymaking process. For example, a tension was recognized between the federal government's responsibility for ensuring access to flood damage insurance in the form of affordable premiums and the geographers' aim to provide effective price signals for risk reduction and damage mitigation through risk-based insurance premiums. This tension was recognized because of the insights offered by geographical expertise; the work of the Tennessee Valley Authority, a regulatory agency that elaborately tested with price signals and regulatory standards, was actively communicated by social geographers in an effort to demonstrate the practical feasibility and good results of floodplain management. Their studies also provided insight into the costs spatial planning measures would confer on local-level actors. When the NFIP was adopted in 1968, policymakers traded off the goal of sending effective price signals for flood damage mitigation against the goal of affordable flood insurance and decided to subsidize insurance premiums in high-risk areas.

Over time, geographical expertise continued to highlight the local-level effects of spatial planning measures. The Water Resources Council, which seated many social geographers, recurrently published guidelines for damage mitigation to assist individuals and communities in acting on their newly assigned responsibilities in flood governance. By specifying options for local actors, policymakers were able to grasp the practical consequences of spatial planning measures. In the 1970s, this facilitated the recognition of a conflict of interest between requiring local communities to restrict building activities in their floodplains and local communities' aim to facilitate economic development in these areas. A new trade-off was made, in which federal support of the program was increased to legitimize an expansion of the federal government's role in local spatial planning.

Up to the 1980s, the interaction between social geographers and policymakers facilitated the recognition of the distributive aspects of the US spatial planning policy. As was indicated in the interviews, affordability was always a factor in the policy discussions on the NFIP.²² However, under neo-liberalism in the 1980s, responsibilities for the NFIP shifted from HUD to the independent regulatory agency FEMA, and a new emphasis was placed on the fiscal independence of the NFIP. As a result of this new policy goal, federal subsidies and financial support for damage mitigation were cut back. With this, costs and responsibilities for dealing with floods were transferred to local-level actors. However, under the operational expertise of FEMA, these shifts in costs and responsibilities were justified based on their operational effectiveness. Hurricane Katrina revealed the (distributive) implications of these policy choices, which came as a shock to policymakers. The next chapter examines how this situation was dealt with.

²² Interview US Government Accountability Office, April 25, 2014, Washington, DC; Interview Resources for the Future, April 22, 2014, Washington, DC.