

Discretion Without Accountability: Presidential Disaster Declarations, Climate, and Damaging Floods, 1965-1997

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Abstract

Federal disaster assistance is one component of the U.S. strategy for coping with damaging floods. State and local governments, businesses, and individuals can apply to receive assistance after the president has declared a major disaster or emergency. Because the availability of disaster assistance influences decisions about flood prevention and mitigation, experts debate its effects on the public costs of disasters. This study analyzes flood-related presidential declarations of major disaster and emergency from 1965 through 1997. It compares the annual number of declarations to measures of precipitation and flood damage, finding that presidents have differed significantly in disaster declaration policy. The differences among seven presidential administrations are unrelated to political party affiliation, or changes in the laws governing disaster declarations. There is some evidence that politics and the political philosophy of individual presidents influence the issuance of declarations. Laws and regulations governing presidential declarations of major disaster and emergency are deliberately vague, in spite of numerous recommendations to the contrary, leaving much discretion to the president. The paper questions the implications of the present approach for effective planning and consistent national flood policies.

1. Introduction

The number of presidential declarations of major disaster and emergency has increased dramatically in the 1990s. Increasing federal government costs have accompanied the increasing declarations, prompting policy makers to express concern and look for ways to reduce these costs (GAO 1998). Platt (1999, p. xvii) questions present policy:

On the one hand, the federal government is called upon to assume a major share of state, local, and private economic costs of disasters through grants, subsidized loans, and government-backed insurance programs. But on the other hand, the government at all levels is increasingly impotent to demand as a condition of such benefits that local governments and individuals assume the political and financial burdens of curtailing unwise development in hazardous locations.

A majority of presidential disaster declarations are related to floods. Federal disaster assistance is one component of the national strategy for coping with damaging floods, and its availability influences

decisions. Consequently, the nation's flood and disaster policies are inextricably tied together. Some have argued that government policies, including disaster assistance, lead to greater flood damages: The greatest enemy of good floodplain management is disaster assistance. (Phillippi 1995).

Others, such as James Lee Witt, Director of the Federal Emergency Management Agency in 1998 have argued that changes in climate may have contributed to an increase in the frequency of damaging floods. He notes that regardless of whether you believe the cause is global warming or natural changes in weather patterns, there is no disagreement that the frequency and severity of what we call 'weather events' are on the rise" (Witt 1998).

On the one hand, there is reason to suggest that climate changes have contributed to an increase in flood frequency. Total annual precipitation, averaged across the United States, has shown a statistically significant increasing trend since the 1930s (figure 1). Precipitation peaks in 1973 and 1993 both coincide with severe floods on the Mississippi River. But, on the other hand, there is no evidence of increasing maximum streamflows (Lins and Slack 1999). At the same time, total annual flood damage has shown an increase since the 1930s (figure 2).

Pielke and Downton (2000) show statistically significant relationships between precipitation and flood damage, and find that the relationship is strengthened if population growth is taken into account. (Population is shown by the dashed line in figure 2.) Yet, precipitation explains a relatively small amount of the interannual variability in flood damage. The findings suggest that total precipitation may be less important than the timing and location (with respect to exposed property) of precipitation in determining flood damage.

The number of flood-related disaster declarations in each fiscal year from 1965-1998 is shown in figure 3.¹ The figure also indicates presidential administrations. An increase since the 1980s is evident;

¹ FEMA provided a complete list of counties that received flood- or hurricane-related disaster site designation from December 24, 1964, through March 3, 1998 (Mike Buckley, personal communication). Flood-related disaster declarations for March-September 1998 were obtained from the FEMA website and manually added to the counts to complete the 1998 fiscal year in figure 3. In this study, we include as flood-related disasters of all types: a flood and tornado, 1/3 severe storm, 1/3 coastal storm, and 1/3 dam/levee break, because these incidents frequently involve flooding as a major cause of damage. High flood losses occasionally are associated with low-intensity hurricanes; therefore, disasters of type " hurricane were screened to include only tropical storms and category 1 hurricanes. In addition

however, high numbers of flood-related disasters were also declared in the 1970s

This paper addresses the following questions: Is the number of flood-related presidential disaster declarations related to annual variations in precipitation and flood damage? If we control for variations in precipitation and flood damage, how have presidential administrations differed in their numbers of flood-related declarations? Are the general criteria for presidential disaster declarations (as specified in the Stafford Act) being observed?

2. Flood-related Disaster Declarations

The power of the U.S. President to declare a major disaster, making federal assistance available to impacted communities, began with the Disaster Relief Act of 1950. The scope and organization of federal disaster response has changed substantially with successive legislation (Sylves 1998; Platt 1999).

The Disaster Relief Act of 1974 expanded disaster assistance to include assistance to individuals and families, provided for mitigation efforts, and initiated a more unified approach to all types of hazards. President Carter established the Federal Emergency Management Agency (FEMA) in 1979 to consolidate and coordinate disaster response efforts. The Robert T. Stafford Disaster Relief and Emergency Assistance Act (PL 100-707), adopted in 1988, broadened the president's authority to judge a disaster, providing more latitude to approve marginal events as disasters or emergencies.

FEMA provides assistance for presidentially declared disasters under the Stafford Act. The agency explains: "not every disaster requires federal assistance. Typically before FEMA and other federal agencies provide assistance to state and local governments, the governor must request assistance and the president must then make a declaration of major disaster or emergency" (<http://www.fema.gov/fema/pdd.htm>, 1999)

The president has great discretion in deciding whether to declare a disaster. General criteria set forth in the Stafford Act for evaluating gubernatorial requests include: (1) the severity and magnitude of the incident, (2) the impact of the event, and (3) whether the incident is beyond the capabilities of the state and affected local governments.

In declaring a disaster, the president follows no specific set of objective criteria; rather, each event or incident is evaluated on its own merits (Sylves 1998). Indeed, members of Congress and local governments have opposed attempts by FEMA to establish consistent criteria (Platt 1999). The Stafford Act specifically prohibits the use of arithmetic formulas or sliding scales to deny assistance (PL 100-707, sec. 320). The vagueness of the criteria used to declare disasters means that declaration decisions are made [subjectively] and are not [supported by standard factual data or related to published criteria] (GAO 1995, p. 5).

A declaration of major disaster or emergency is issued to a state, within which one or more counties are

to declarations in the aftermath of three major hurricanes that had caused large-scale flooding as they slowed.

declared as disaster sites. Between December 24, 1964, and March 3, 1998, Rhode Island was the only state with no flood-related disaster declarations, and most counties (over 88%) were designated at least once. Frequent flood-related disasters (10 or more per county) occurred in much of North Dakota and in large regions of Minnesota, Washington, and California.

At the state level, during calendar years 1965-1997, Texas and California received the largest number of flood-related disaster declarations, with 38 and 30 declarations, respectively. Louisiana and Minnesota are tied for third place with 25 declarations each. However, the numbers of counties designated as flood-related disaster sites give a somewhat different picture. Minnesota, Iowa, and Missouri received the highest number of site designations, with over 480 each during 1965-1997. Texas was in fourth place and California in eighth. (California counties are relatively large in population and area, so its average "site" includes more land and people.)

Of the 720 flood-related disaster declarations in our study, 84 (nearly 12%) involved just one county, and 168 (23%) involved three counties or less. The median was eight counties per declaration. The median number of counties included in the disaster declarations of each president range from 5 counties per declaration during the Reagan Administration, to 11 per declaration during the Clinton Administration.

For this study, we analyzed both the number of flood-related declarations (states) and the number of sites designated (counties). The results of the two analyses are similar, therefore this report focuses primarily on the state-level declarations.

3. Comparison of Presidential Administrations

The mean annual disaster declarations, precipitation, and damages for each administration are shown in table 1, ordered by number of disaster declarations. President Clinton issued the most flood-related disaster declarations per year and designated the most counties as disaster sites. Precipitation and flood damages were also at their highest levels during the Clinton Administration.

Analysis of covariance techniques were used to test whether the seven presidential administrations differ significantly in disaster declarations and number of disaster sites, using precipitation and damages as covariates to control for differences in the incidence of damaging floods. Commonly used statistical techniques require that data be normally distributed and have homogeneous variance. Frequency distributions of the data series were tested for normality, and transformations were applied to the disaster counts and the flood damages to approximate normal distributions with reasonably homogeneous variance, creating the following measures:

$$\begin{aligned} \text{SDECL} &= \sqrt{\text{number of flood-related disaster declarations}}; \\ \text{SSITES} &= \sqrt{\text{number of flood-related disaster sites}}; \\ \text{LD} &= \ln(\text{damages}), \text{ where damages are measured in billions of 1995 dollars.} \end{aligned}$$

Data series that did not require transformation are:

$$\begin{aligned} \text{TP} &= \text{Total annual precipitation averaged over weather stations in the conterminous U.S., in inches;} \\ \text{ADMIN} &= \text{Index of the seven presidential administrations, 1965-1997 (1 = Johnson, 2 = Nixon, 7 = Clinton, in chronological order).} \end{aligned}$$

Table 2 shows the results of the analysis of SDECL. Both TP and LD are statistically significant predictors of SDECL, as is the presidential administration index (ADMIN). The hypothesis that there is no difference between the seven administrations can be confidently rejected ($F = 9.24, p \leq 0.0001$, and $R^2 = 0.755$). The results for SSITES (not shown) are even stronger ($F = 18.2, p \leq 0.0001$, and $R^2 = 0.859$). This demonstrates that after controlling for precipitation and flood damages, the likelihood of a flood-related disaster declaration differs depending upon the presidential administration. Differences in the number of disaster declarations are not simply a result of coincidental differences in the incidence of damaging floods during a president's term in office.

How have the individual administrations differed in response to damaging floods? We are particularly interested in the records of the three most recent presidents: Reagan, Bush, and Clinton. In table 2 (B), the mean values of SDECL have been adjusted for year-to-year variations in precipitation and flood losses. Note that after adjustment, the number of declarations rises in the Johnson and Bush Administrations and falls in the Clinton Administration (a result of adjustment for serious flood damage in the 1990s). Pairwise comparisons in the table show which differences are statistically significant: President Reagan issued significantly fewer flood-related disaster declarations than Presidents Nixon, Bush, and Clinton; whereas, President Clinton issued significantly more flood-related disaster declarations than Presidents Johnson and Reagan.

Whatever the officially stated policies may have been, we can conclude that the outcomes (in terms of numbers of disaster declarations and sites designated) were significantly different in the Reagan Administration from those in the Nixon, Bush, and Clinton Administrations. The distinctions do not follow party lines. Indeed, frequencies of flood-related disaster declarations and site designations under Clinton (a Democrat) are most similar to those under Nixon and Bush (both Republicans). And those under Reagan (a Republican) are most similar to those under Johnson and Carter (both Democrats).

The possibility that flood-related disaster declarations might increase during election years was investigated by doing a similar covariance analysis that compared the number of declarations in years preceding presidential elections with the number in all other years. No significant difference was found, indicating no systematic pattern of presidents appealing to voters through disaster declarations in election years.

4. Flood-related Disasters and Damage, by State

To qualify for major disaster assistance under the Stafford Act, a state is supposed to show that the disaster is of such severity and magnitude that effective response is beyond the capabilities of the State and the affected local governments. We consider three possible indicators of a state's ability to cover the cost of disasters: per capita damage, damage as a percent of annual state expenditures, and per capita damage as a percent of median household income² (cf. GAO 1995).

² USACE estimates of flood losses in each state (in 1995 dollars) for the hydrological years 1983-1997 are used (<http://www.usace.army.mil/inet/functions/cw/cecwe/flood.htm>). Data used to compute measures of state's ability to pay are: state populations in 1990 (U.S. Census Bureau), state expenditures in 1995 (National Association of State Budget Officers 1998) and 1993-1995 state average median income, in 1995 dollars (U.S. Census Bureau).

The relationship of the number of flood-related disaster declarations to total damage and to the three measures of state's ability to pay is indicated by the following correlations with SDECL:

	r
ln(total damage)	0.57
ln(per capita damage)	0.35
ln(damage as percent of state expenditures)	0.36
ln(per capita damage as percent of median household income)	0.36

Each correlation is statistically significant; however, the number of declarations is related much more strongly to total damage than to the three indicators of ability to pay. Indeed, the correlation with SDECL is about the same for the three indicators. Therefore, we use the simplest indicator, damage per capita, to summarize the results: Based on r^2 , total damage can explain 32% of the variance in SDECL, while per capita damage can explain only 12%.

Table 3 shows the 25 top-ranked states in per capita flood damage during the 15-year period 1983-1997. Total damage, disaster declarations, and number of counties designated as disaster sites are also shown. North Dakota, the top-ranked state with nearly \$6000 flood damage per person, received 7 disaster declarations (240 counties). Second-ranked Iowa, which had \$2800 damage per capita (and the highest total damage), received 10 disaster declarations (235 counties). Far down the list, Texas suffered \$166 damage per capita and received 15 disaster declarations (334 counties).

The evidence suggests that, in practice, a state's ability to pay has not been a major consideration in presidential decisions about whether to declare flood-related disasters. Floods that inflict high total damage are likely to receive high media coverage, perhaps explaining the relatively strong relationship of declarations to total damage.

Flood experiences in Texas provide an illustration of how presidents have differed in their use of the power to declare disasters. In 1987, under the Reagan Administration, Texas suffered over \$700 million in flood damage but no flood-related (or hurricane-related) disaster declarations were issued for Texas. In 1989 and 1990, under the Bush Administration, Texas suffered flood-related damage somewhat over \$400 million each year and disaster declarations were approved encompassing 103 counties in 1989 and 64 counties in 1990. Of the 334 flood-related disaster site designations in Texas between 1983 and 1997, 265 (79%) were issued during 1989-1992 under the Bush Administration.

5. Conclusions

This analysis indicates that presidents in the last 33 years have differed markedly in their declarations of major disasters and emergencies. The number of flood-related disaster declarations has been somewhat related to precipitation and flood damage, but there have also been significant differences between administrations, apparently unrelated to the severity of the floods.

It is difficult to determine the impact of changes in legislation. Disaster relief legislation since 1950 has consistently tended to expand the scope of disaster responses available to the president. The establishment of FEMA in 1979 did not lead to an immediate increase in disaster declarations (perhaps because of President Reagan's policy orientation). On the other hand, the passage of the Stafford Act in 1988, giving the president more latitude to approve smaller-scale disasters, may have contributed to the

increase in disaster declarations in the 1990s.

The general criteria for approval of disaster declarations under the Stafford Act are the following: (1) the severity and magnitude of the incident, (2) the impact of the event, (3) whether the incident is beyond the capabilities of the state and affected local governments. In the case of floods, the first two criteria suggest extreme or unusual weather conditions or water flows that cause severe and widespread losses. During 1965-1997, the annual number of flood-related disaster declarations is somewhat correlated with precipitation and damage, indicating that criteria (1) and (2) were applied; however, the differences between presidential administrations indicate that the standards of severity, magnitude, and impact have shifted rather dramatically between the 1980s and the 1990s. The number of declarations is related much more strongly to total damage than to any damage measure adjusted for a state's ability to pay, indicating that criteria (3) has been largely ignored at the state level. (Local government capability was not examined in this study.)

The differences between the seven administrations appear to be less related to changes in law than to differences between presidents. Perhaps surprisingly, the differences do not follow political party lines, suggesting that disaster declarations are not clearly linked to partisan ideology.

Yet, individual presidents do show some consistency in responding to flood-related disasters; for example, Presidents Nixon, Bush, and Clinton issued relatively high numbers of flood-related disaster declarations, while Presidents Carter and Reagan issued relatively few. By relying heavily on presidential discretion, the Stafford Act establishes a disaster response system that provides little consistency between administrations and is strongly influenced by the personalities of presidents. Whether a state receives assistance in disaster recovery may be influenced by whether the current president tends to make decisions on the basis of cost-benefit analysis or human sympathy. Furthermore, cronyism and the level of media coverage can easily influence those decisions. All of these factors work against accountability in federal disaster policy (cf. Platt 1999).

The observed inconsistency between administrations suggests that disaster declaration decisions are, in significant degree, political decisions with political consequences. Rising federal disaster costs are not a straightforward result of changing climate or increasing vulnerability to floods. The federal government has within its authority and control an ability to dramatically reduce or expand the costs it bears for flood disasters. The disaster declaration process requires careful compromises between needed assistance in disasters and positive and negative incentives that arise from the availability of assistance. The elucidation of criteria for disaster declarations is important, if the effects of these incentives are to be understood and managed effectively.

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Table 1. Mean annual flood-related disaster declarations, estimated flood damages, and precipitation, by Presidential Administration, hydrological years 1965-1997. Administrations are listed in order of decreasing mean annual disaster declarations.

President	Hydrological Years	N	Annual Means			
			Disaster Declarations	Disaster Sites	Precipitation (inches)	Damage (millions 1995 dollars)
Clinton	1993-1997	5	32.2	603	31.4	7553.
Nixon	1969-1974	6	27.2	393	30.5	4469.
Ford	1975-1976	2	26.0	251	29.6	5370.
Bush	1989-1992	4	22.3	357	30.2	1469.
Carter	1977-1980	4	20.0	181	29.5	3478.
Reagan	1981-1988	8	14.5	133	29.9	3440.
Johnson	1965-1968	4	11.8	190	28.2	1681.

* Difference between adjusted means is significant at 95% confidence level.

Table 2. Analysis of covariance of the number of flood-related disaster declarations, by presidential administration.

Dependent variable: SDECL = sqrt(number of flood-related disaster declarations)

Predictor: ADMIN = presidential administration

Covariates: TP = total precipitation

LD = ln(damages)

Model F = 9.24, {Prob > F} = 0.0001; R² = 0.755

(A) Source	Type I Sum of Squares	df	Mean Square	F	Prob > F
Covariates:					
TP	10.765 1	10.765	24.25		0.0001
LD	2.833 1	2.833	6.38		0.0185
Predictor:					
ADMIN	19.214 6	3.202	7.22		0.0002
Error	10.65224	0.444			
Total	43.46432				

(B) Differences in SDECL Between Administrations

	Johnson	Nixon	Ford	Carter	Reagan	Bush	Clinton
Original Mean	3.37	5.06	5.08	4.39	3.70	4.70	5.62
Adjusted Mean	3.96	4.95	4.86	4.41	3.79	4.93	5.02
Prob > t , H ₀ : Adjusted mean(i) = Adjusted mean(j)							
Johnson				0.682	0.062	0.043*	
Nixon					0.004*	0.966	0.864
Ford					0.062	0.917	0.786
Carter					0.144	0.313	0.202
Reagan						0.012*	0.005*
Bush							0.854
Clinton							

* Difference between adjusted means is significant at 95% confidence level.

Table 3. Total flood damages and flood-related disaster declarations for the states ranked highest in per capita damages, 1983-1997.

Rank	State	Per Capita Damage (1995\$)	Total Damage (millions 1995\$)	Disaster Declarations	Disaster Sites
1	North Dakota	5988.93	3825.73	7	240
2	Iowa	2806.93	7794.15	10	235
3	South Dakota	1779.66	1238.65	8	233
4	Louisiana	1630.39	6880.19	14	188
5	Oregon	1213.86	3450.18	6	56
6	Utah	859.32	1480.48	4	39
7	Missouri	825.59	4224.62	9	274
8	West Virginia	777.41	1394.28	7	107
9	Mississippi	651.79	1677.19	10	173
10	Nevada	545.92	656.10	3	14
11	Oklahoma	512.50	1612.12	9	181
12	Kansas	464.68	1151.27	3	73
13	Nebraska	452.52	714.26	7	131
14	Arkansas	427.38	1004.65	9	178
15	Minnesota	411.56	1800.59	9	249
16	Illinois	323.19	3694.24	14	217
17	Wisconsin	306.87	1501.13	9	96
18	Arizona	241.02	883.40	5	37
19	Virginia	232.71	1439.84	8	168
20	Kentucky	231.34	852.56	7	239
21	Vermont	220.77	124.24	9	47
22	California	182.19	5421.91	10	260
23	Idaho	179.60	180.81	3	40
24	Washington	170.20	828.30	14	143
25	Texas	166.45	2827.39	15	334

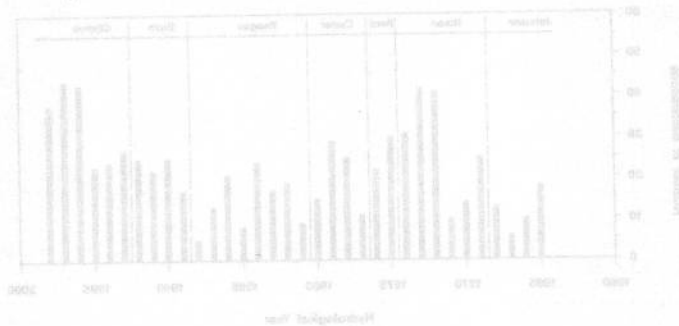


Figure 3. Number of flood-related disaster declarations involving floods by hydrological year.

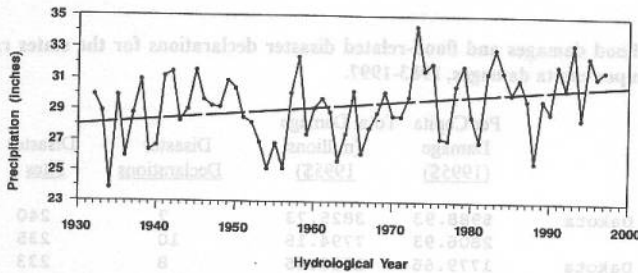


Figure 1. U.S. total annual precipitation, by hydrological year (October-September).

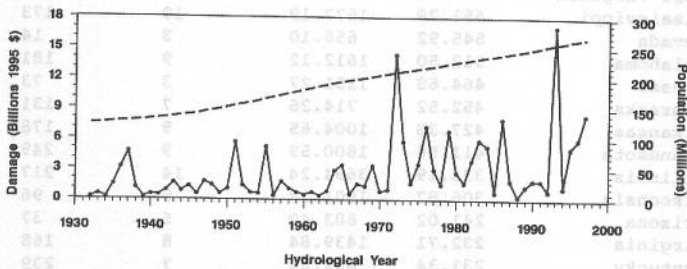


Figure 2. U.S. flood losses by hydrological year (solid line), and population on July 1 of each year (dashed line).

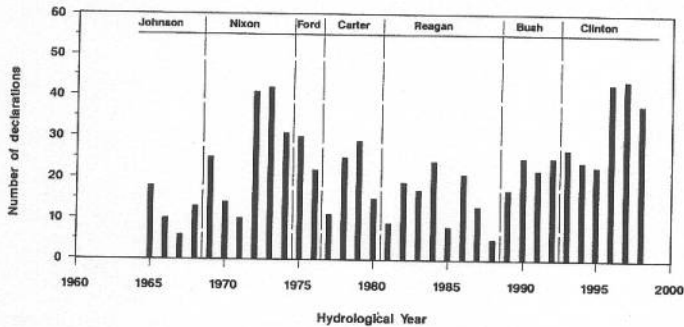


Figure 3. Number of presidential disaster declarations involving floods, by hydrological year.