



**Calhoun: The NPS Institutional Archive**

---

Theses and Dissertations

Thesis Collection

---

2011-12

**The perfect storm : changing national policies to  
reduce flooding impacts and costs**

Keefe, Sandra A.

Monterey, California. Naval Postgraduate School

---

<http://hdl.handle.net/10945/10627>



Calhoun is a project of the Dudley Knox Library at NPS, furthering the precepts and goals of open government and government transparency. All information contained herein has been approved for release by the NPS Public Affairs Officer.

**Dudley Knox Library / Naval Postgraduate School  
411 Dyer Road / 1 University Circle  
Monterey, California USA 93943**

<http://www.nps.edu/library>



**NAVAL  
POSTGRADUATE  
SCHOOL**

**MONTEREY, CALIFORNIA**

**THESIS**

**THE PERFECT STORM: CHANGING  
NATIONAL POLICIES TO REDUCE  
FLOODING IMPACTS AND COSTS**

by

Sandra A. Keefe

December 2011

Thesis Co-Advisors:

Glen Woodbury  
Sam Clovis

**Approved for public release; distribution is unlimited**

THIS PAGE INTENTIONALLY LEFT BLANK

<b>REPORT DOCUMENTATION PAGE</b>			<i>Form Approved OMB No. 0704-0188</i>
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.			
<b>1. AGENCY USE ONLY (Leave blank)</b>	<b>2. REPORT DATE</b> December 2011	<b>3. REPORT TYPE AND DATES COVERED</b> Master's Thesis	
<b>4. TITLE AND SUBTITLE</b> The Perfect Storm: Changing National Policies to Reduce Flooding Impacts and Costs		<b>5. FUNDING NUMBERS</b>	
<b>6. AUTHOR(S)</b> Sandra A. Keefe		<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>	
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> Naval Postgraduate School Monterey, CA 93943-5000		<b>10. SPONSORING/MONITORING AGENCY REPORT NUMBER</b>	
<b>9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> N/A		<b>11. SUPPLEMENTARY NOTES</b> The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB Protocol number _____ N/A _____.	
<b>12a. DISTRIBUTION / AVAILABILITY STATEMENT</b> Approved for public release; distribution is unlimited		<b>12b. DISTRIBUTION CODE</b> A	
<b>13. ABSTRACT (maximum 200 words)</b> Flooding matters. As the nation's most common natural hazard, flooding costs this nation economically, disrupts communities and commerce, and renders communities and extrapolated—the nation—less than fully postured for other homeland security threats. It will not get better. Demographics leading to more people living in flood-hazard areas and forecasted increases in precipitation are converging to create the perfect storm. This thesis examines two national policies that can influence the impact and costs of flooding: The National Flood Insurance Program and the Robert T. Stafford Disaster Act. Examination and research reveals that the NFIP has failed to achieve its goals of reducing flood losses and political, economic, and societal factors serve to make reforming the NFIP effectively less than likely. A policy options analysis examines how changes to the Stafford Act might influence a reduction in the impact and costs of flooding where the political, economic, and societal factors at play may lead to favorable implementation consideration. The policy options include changing enforcement and incentive provisions of the Stafford Act along with a proposal to begin a national dialogue on mitigation through the creation of a National Mitigation Collaborative Consortium.			
<b>14. SUBJECT TERMS</b> Mitigation National Flood Insurance Program (NFIP) FEMA, Hazard Mitigation Grant Program (HMGP), Flood, Stafford Act, Disaster Assistance			<b>15. NUMBER OF PAGES</b> 177
			<b>16. PRICE CODE</b>
<b>17. SECURITY CLASSIFICATION OF REPORT</b> Unclassified	<b>18. SECURITY CLASSIFICATION OF THIS PAGE</b> Unclassified	<b>19. SECURITY CLASSIFICATION OF ABSTRACT</b> Unclassified	<b>20. LIMITATION OF ABSTRACT</b> UU

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)  
Prescribed by ANSI Std. Z39-18

THIS PAGE INTENTIONALLY LEFT BLANK

**Approved for public release; distribution is unlimited**

**THE PERFECT STORM: CHANGING NATIONAL  
POLICIES TO REDUCE FLOODING IMPACTS AND COSTS**

Sandra A. Keefe  
Deputy Mitigation Division Director, FEMA Region 6, Denton, Texas  
B.S., University of Louisville, 1985

Submitted in partial fulfillment of the  
requirements for the degree of

**MASTER OF ARTS IN SECURITY STUDIES  
(HOMELAND SECURITY AND DEFENSE)**

from the

**NAVAL POSTGRADUATE SCHOOL  
December 2011**

Author: Sandra A. Keefe

Approved by: Glen Woodbury  
Thesis Co-Advisor

Sam Clovis  
Thesis Co-Advisor

Daniel Moran, PhD  
Chair, Department of National Security Affairs

THIS PAGE INTENTIONALLY LEFT BLANK

## **ABSTRACT**

Flooding matters. As the nation's most common natural hazard, flooding costs this nation economically, disrupts communities and commerce, and renders communities and extrapolated—the nation—less than fully postured for other homeland security threats. It will not get better. Demographics leading to more people living in flood-hazard areas and forecasted increases in precipitation are converging to create the perfect storm. This thesis examines two national policies that can influence the impact and costs of flooding: The National Flood Insurance Program and the Robert T. Stafford Disaster Act. Examination and research reveals that the NFIP has failed to achieve its goals of reducing flood losses and political, economic, and societal factors serve to make effectively reforming the NFIP less than likely. A policy options analysis examines how changes to the Stafford Act might influence a reduction in the impact and costs of flooding where the political, economic, and societal factors at play may lend to favorable implementation consideration. The policy options include changing enforcement and incentive provisions of the Stafford Act along with a proposal to begin a national dialogue on mitigation through the creation of a National Mitigation Collaborative Consortium.



THIS PAGE INTENTIONALLY LEFT BLANK

# TABLE OF CONTENTS

<b>I.</b>	<b>INTRODUCTION.....</b>	<b>1</b>
<b>A.</b>	<b>OVERVIEW .....</b>	<b>1</b>
<b>B.</b>	<b>HISTORY: THEN AND NOW, THE PERFECT STORM.....</b>	<b>1</b>
<b>C.</b>	<b>PUBLIC POLICY INFLUENCES (PROBLEM STATEMENT) .....</b>	<b>3</b>
	<b>1. The National Flood Insurance Program .....</b>	<b>3</b>
	<b>a. The NFIP's Rate Structure.....</b>	<b>4</b>
	<b>b. Lack of a Penalty Structure .....</b>	<b>4</b>
	<b>c. The NFIP's Intergovernmental Structure .....</b>	<b>4</b>
	<b>2. The Robert T. Stafford Disaster Relief and Emergency Assistance Act.....</b>	<b>6</b>
<b>D.</b>	<b>THE NEXUS TO HOMELAND SECURITY .....</b>	<b>7</b>
<b>E.</b>	<b>RESEARCH QUESTIONS.....</b>	<b>9</b>
<b>F.</b>	<b>LITERATURE REVIEW .....</b>	<b>9</b>
	<b>1. The Impact and Costs of Flooding .....</b>	<b>10</b>
	<b>2. The NFIP's Influence on the Impact and Costs of Flooding.....</b>	<b>11</b>
	<b>3. The Stafford Act's Influence on the Impact and Costs of Flooding .....</b>	<b>13</b>
	<b>4. Approaches and Suggested Solutions to Reduce the Impact and Costs of Flooding.....</b>	<b>16</b>
	<b>5. The Role of the Federal Government and Its Influence on the Impact and Costs of Flooding .....</b>	<b>21</b>
	<b>6. Conclusion .....</b>	<b>23</b>
<b>G.</b>	<b>HYPOTHESIS.....</b>	<b>24</b>
<b>H.</b>	<b>SIGNIFICANCE OF RESEARCH .....</b>	<b>24</b>
<b>I.</b>	<b>METHODOLOGY .....</b>	<b>25</b>
<b>J.</b>	<b>OVERVIEW OF UPCOMING CHAPTERS.....</b>	<b>27</b>
<b>II.</b>	<b>FLAWED POLICY: THE NATIONAL FLOOD INSURANCE PROGRAM....</b>	<b>31</b>
<b>A.</b>	<b>INTRODUCTION.....</b>	<b>31</b>
<b>B.</b>	<b>OVERVIEW OF THE NFIP.....</b>	<b>31</b>
	<b>1. Floodplain Identification and Mapping.....</b>	<b>32</b>
	<b>2. Floodplain Management.....</b>	<b>32</b>
	<b>3. Flood Insurance.....</b>	<b>32</b>
<b>C.</b>	<b>UNDERSTANDING THE NFIP BY REVIEWING ITS HISTORY.....</b>	<b>33</b>
<b>D.</b>	<b>WHERE IT IS NOT WORKING .....</b>	<b>39</b>
	<b>1. Key Weakness: Premium Rate Structure and Influencing Development .....</b>	<b>39</b>
	<b>2. Key Weakness: Enforcement of Floodplain Management Practices .....</b>	<b>41</b>
	<b>3. Key Weakness: No Ceiling on Losses.....</b>	<b>45</b>
<b>E.</b>	<b>AREAS WHERE THE NFIP <u>IS</u> WORKING .....</b>	<b>46</b>
	<b>1. Community Rating System .....</b>	<b>46</b>

2.	<b>Identifying Flood Risk .....</b>	<b>47</b>
F.	<b>WHY IT IS LIKELY THE NFIP CANNOT BE FIXED .....</b>	<b>50</b>
G.	<b>CHAPTER SUMMARY .....</b>	<b>53</b>
<b>III.</b>	<b>THE STAFFORD ACT AND HOW IT INFLUENCES THE IMPACT AND COSTS OF FLOODING .....</b>	<b>57</b>
A.	<b>INTRODUCTION.....</b>	<b>57</b>
B.	<b>OVERVIEW OF THE STAFFORD ACT .....</b>	<b>57</b>
C.	<b>UNDERSTANDING THE ACT BY REVIEWING ITS HISTORY.....</b>	<b>58</b>
D.	<b>HOW THE STAFFORD ACT INFLUENCES THE IMPACT AND COSTS OF FLOODING .....</b>	<b>62</b>
1.	<b>The Three-Strike Rule.....</b>	<b>63</b>
2.	<b>Hazard Mitigation Grant Program Provisions .....</b>	<b>64</b>
a.	<i>The Match Requirement .....</i>	<i>65</i>
b.	<i>Acquisition, Relocation or Demolition.....</i>	<i>67</i>
c.	<i>Perceptions on How FEMA Has Interpreted and Administered the Stafford Act .....</i>	<i>69</i>
E.	<b>THE TOP-DOWN HIERARCHY OF THE HMGP .....</b>	<b>73</b>
F.	<b>CHAPTER SUMMARY.....</b>	<b>74</b>
<b>IV.</b>	<b>METHODOLOGY .....</b>	<b>77</b>
A.	<b>INTRODUCTION.....</b>	<b>77</b>
B.	<b>EVALUATIVE CRITERIA.....</b>	<b>78</b>
1.	<b>Effectiveness .....</b>	<b>79</b>
2.	<b>Congressional Support .....</b>	<b>79</b>
3.	<b>Legality.....</b>	<b>79</b>
4.	<b>Federal Costs .....</b>	<b>79</b>
5.	<b>Burden to State and Local Stakeholders .....</b>	<b>80</b>
6.	<b>Social and Cascading Impacts .....</b>	<b>80</b>
C.	<b>CONCLUSION .....</b>	<b>80</b>
<b>V.</b>	<b>POLICY OPTION ONE—ENFORCEMENT .....</b>	<b>83</b>
A.	<b>INTRODUCTION.....</b>	<b>83</b>
B.	<b>OVERVIEW OF THE THREE-STRIKE RULE .....</b>	<b>83</b>
C.	<b>PROPOSAL: IMPLEMENT THE THREE-STRIKE RULE .....</b>	<b>84</b>
D.	<b>ANALYSIS AND EVALUATION.....</b>	<b>84</b>
1.	<b>Effectiveness. Would Implementing This Provision Reduce the Impact and Costs of Floods? .....</b>	<b>85</b>
2.	<b>Is There Congressional Support to Enforce This Provision? .....</b>	<b>86</b>
3.	<b>Legality: What Is Required to Implement This Provision? .....</b>	<b>87</b>
4.	<b>What Are the Federal Costs to Implement?.....</b>	<b>88</b>
a.	<i>Disaster Relief Fund (DRF) Costs .....</i>	<i>88</i>
b.	<i>Federal Implementation and Administration Costs .....</i>	<i>89</i>
5.	<b>What Is the Burden of Implementation to State and Community Officials?.....</b>	<b>90</b>
a.	<i>Complexity.....</i>	<i>90</i>
b.	<i>Funding Outlays .....</i>	<i>90</i>

6.	What Are the Social and Cascading Impacts Associated with Implementation? .....	90
E.	RECAP OF ANALYSIS .....	91
F.	CONCLUSION .....	92
VI.	POLICY OPTION TWO—INCENTIVES.....	95
A.	INTRODUCTION.....	95
B.	CONTEXT.....	95
C.	OVERVIEW OF THE HMGP .....	97
D.	PROPOSAL. CHANGE THE MATCH REQUIREMENT.....	98
1.	Proposal Specifics.....	98
2.	Background Specific to the Proposal .....	99
E.	ANALYSIS AND EVALUATION.....	101
1.	Effectiveness. Would Implementing this Provision Reduce the Impact and Costs of Floods? .....	101
2.	Is There Congressional Support for This Proposal? .....	103
3.	Legality: What Is Required to Implement This Provision?.....	103
4.	What Are the Federal Costs to Implement?.....	103
a.	<i>Disaster Relief Fund Costs</i> .....	103
b.	<i>Federal Implementation and Administration Costs</i> .....	104
5.	What Is the Burden of Implementation to State and Community Officials?.....	104
a.	<i>Complexity</i> .....	104
b.	<i>Funding Outlays</i> .....	105
6.	What Are the Social and Cascading Impacts Associated with Implementation? .....	105
F.	RECAP OF ANALYSIS .....	106
G.	PROPOSAL: EXPAND BUY-OUT OPTIONS .....	107
1.	Proposal Specifics.....	107
2.	Background Specific to the Proposal .....	107
H.	ANALYSIS AND EVALUATION.....	109
1.	Effectiveness: Would Implementing This Provision Reduce Losses from Floods?.....	109
2.	Is There Congressional Support to Enforce This Provision? .....	109
3.	Legality: What Is Required to Implement This Provision?.....	110
4.	What Are the Federal Costs to Implement?.....	110
a.	<i>Disaster Relief Fund Costs</i> .....	110
b.	<i>Federal Implementation and Administration Costs</i> .....	110
5.	What Is the Burden of Implementation to State and Community Officials?.....	111
a.	<i>Complexity</i> .....	111
b.	<i>Funding Outlays</i> .....	111
6.	What Are the Social and Cascading Impacts Associated with Implementation? .....	111
I.	RECAP OF ANALYSIS .....	112
J.	CHAPTER SUMMARY AND CONCLUSION.....	113

<b>VII.</b>	<b>POLICY OPTION THREE—BOTTOM-UP REVIEW</b> .....	<b>115</b>
<b>A.</b>	<b>INTRODUCTION</b> .....	<b>115</b>
<b>B.</b>	<b>OVERVIEW OF THE CURRENT SITUATION</b> .....	<b>115</b>
<b>C.</b>	<b>PROPOSAL. CONDUCT A COMPREHENSIVE AND ALL-INCLUSIVE BOTTOM-UP REVIEW OF THE STAFFORD ACT’S MITIGATION ELEMENTS</b> .....	<b>119</b>
<b>1.</b>	<b>Creating a National Mitigation Collaborative Consortium (NEMA, 2009)</b> .....	<b>119</b>
<b>2.</b>	<b>Funding the Consortium</b> .....	<b>120</b>
<b>3.</b>	<b>Empowering the Consortium</b> .....	<b>120</b>
<b>D.</b>	<b>ANALYSIS AND EVALUATION</b> .....	<b>121</b>
<b>1.</b>	<b>Would Implementing This Provision Reduce Losses from Floods?</b> .....	<b>121</b>
<b>2.</b>	<b>Is There Congressional Support to Enforce This Provision?</b> .....	<b>121</b>
<b>3.</b>	<b>Legality: What Is Required to Implement This Provision?</b> .....	<b>122</b>
<b>4.</b>	<b>What Are the Federal Costs to Implement?</b> .....	<b>122</b>
<b>a.</b>	<i>Disaster Relief Fund Costs</i> .....	<b>122</b>
<b>b.</b>	<i>Federal Implementation and Administration Costs</i> .....	<b>123</b>
<b>5.</b>	<b>What Is the Burden of Implementation to State and Community Officials?</b> .....	<b>123</b>
<b>a.</b>	<i>Complexity</i> .....	<b>123</b>
<b>b.</b>	<i>Funding Outlays</i> .....	<b>124</b>
<b>6.</b>	<b>What Are the Social and Cascading Impacts Associated with Implementation?</b> .....	<b>124</b>
<b>E.</b>	<b>RECAP OF ANALYSIS</b> .....	<b>125</b>
<b>F.</b>	<b>CONCLUSION</b> .....	<b>126</b>
<b>VIII.</b>	<b>CONCLUSION AND RECOMMENDATIONS</b> .....	<b>129</b>
<b>A.</b>	<b>LOOKING BACK—WHAT HAS BEEN COVERED</b> .....	<b>129</b>
<b>B.</b>	<b>RECAP OF FINDINGS AND PRESENTATION OF RECOMMENDATIONS</b> .....	<b>132</b>
<b>1.</b>	<b>Policy Option Two, Reimbursement for Tax Revenue Losses</b> .....	<b>133</b>
<b>2.</b>	<b>Policy Option Three, Bottom-Up Review</b> .....	<b>134</b>
<b>3.</b>	<b>Policy Option Two, Hazard Mitigation Program (HMG) Program Match</b> .....	<b>136</b>
<b>4.</b>	<b>Policy Option One, The Three-Strike Rule</b> .....	<b>137</b>
<b>C.</b>	<b>RESEARCH LIMITATIONS AND AREAS WARRANTING FURTHER RESEARCH</b> .....	<b>138</b>
<b>D.</b>	<b>CONCLUSION: POSSIBLE SOLUTIONS FOR THE PERFECT STORM</b> .....	<b>139</b>
	<b>LIST OF REFERENCES</b> .....	<b>141</b>
	<b>INITIAL DISTRIBUTION LIST</b> .....	<b>159</b>

## LIST OF TABLES

Table 1.	Policy Options Evaluation Matrix .....	26
Table 2.	Evaluation Scoring Results for All Policy Options .....	27
Table 3.	Research Questions.....	77
Table 4.	Policy Options Evaluation Matrix .....	81
Table 5.	Evaluation Scoring Results for the Three-Strike Rule.....	92
Table 6.	\$1M HMGP Disaster Cap Scenario.....	99
Table 7.	Evaluation Scoring Results for Changing HMGP Match Formula .....	106
Table 8.	Evaluation Scoring Results for Changing Buy-Out Provisions.....	113
Table 9.	Evaluation Scoring Results for Bottom-Up Review.....	126
Table 10.	Evaluation Scoring Results for All Policy Options .....	133

THIS PAGE INTENTIONALLY LEFT BLANK

## LIST OF ACRONYMS AND ABBREVIATIONS

ASFPM	Association of State Floodplain Managers
CAV	Community Assistance Visits
CRS	Community Rating System
DHS	Department of Homeland Security
DRF	Disaster Relief Fund
FCSRMC	Florida Catastrophic Storm Risk Management Center
FCO	Federal Coordinating Officer
FEMA	Federal Emergency Management Agency
GAO	General Accounting Office (Before 2004)
GAO	Government Accountability Office (After 2005)
HMGP	Hazard Mitigation Grant Program
HUD	Office of Housing and Urban Development
ICC	Increased Cost of Compliance
JFO	Joint Field Office
NEMA	National Emergency Management Association
NFIP	National Flood Insurance Program
PDM	Pre-Disaster Mitigation
PKEMRA	Post-Katrina Emergency Management Reform Act
PRIMA	Public Risk Management Association (
PW	Project Worksheets
SHELDUS	Spatial Hazard Events and Losses Database for the United States



THIS PAGE INTENTIONALLY LEFT BLANK

## ACKNOWLEDGMENTS

Three people contributed directly and immeasurably to this thesis: Dr Glen Woodbury, Dr. Sam Clovis, and Nadav Morag. Individually and collectively, they nudged me to academic excellence and limits I did not know existed and challenged me to accept nothing less than work reflecting the highest intellectual and creative efforts. They gave freely of their personal and weekend time to assist me in this effort. I am grateful for their assistance and encouragement.

Others contributed indirectly to this thesis in that one's view of the world is a function from whence one has come. From my mother (Virginia Bredell Schneider), I owe a love of books, a quest for knowledge, and the realization that a woman's role in life need not be bound by tradition. From my father (Earl Mathias Schneider), I owe an appreciation that a man's word and honor bears far more weight than any contract, and that the American work ethic means just that –to work hard, to labor long, and to aid one's neighbor's altruistically. From my grandmother, (Margaret Carmody Bredell), I owe an insight into the lives of first and second-generation immigrants to this land of opportunity called America; a realization of what the Great Depression wrought to the day-to-day lives of those in America's heartland; and the epiphany that the value of my life in this world is intrinsic, not dependent on achievement and riches. From my siblings—Neal Schneider, Victoria Schneider Nason, and Douglas Schneider, I owe an understanding of unconditional love and knowledge that my path in life is both a mirror and a looking glass to the common threads that bond us together forever and that my particular path is no better and no less than any of theirs. Without their love and support, I cannot imagine. To my friend of many years, Ursula Anderson, I owe a debt of gratitude in taking the time to mentor me, to give freely of her love and resources, and for nourishing me when sustenance was needed. I also acknowledge Peter Andrysiak for his mentorship throughout the years and without such, professionally I would not have attained the accomplishments I have enjoyed. Lastly and not least, I owe an incalculable amount to the love of my life, Shawn Michael Keefe, whose patience and understanding

of my sometimes irrational need to achieve has enabled me to do things I thought I could never do. And when it is all said and done, it has been his presence and love in my life that has made this theatrical stage presence called my life, worth living.

## **I. INTRODUCTION**

Floods are ‘acts of God,’ but flood losses are largely acts of man.

— (University of Colorado, Boulder, Gilbert White quote, 1942)

### **A. OVERVIEW**

Flooding—irrespective of the source—impacts this country and its citizens profoundly, pervasively, and chronically. The claim of this thesis is that the primary public policy venue designed to reduce flooding and its impacts has failed and likely cannot be sufficiently reformed. That policy venue is the National Flood Insurance Program (NFIP). A different policy venue, the Robert T Stafford Act, may be a viable alternative to achieve what the NFIP cannot, a reduction in the impact and costs of floods in this country.

### **B. HISTORY: THEN AND NOW, THE PERFECT STORM**

Examining the central claim of this thesis is best undertaken with a full view of the magnitude of the problem at hand, namely, flooding.

“Flooding is the most ubiquitous and costly natural hazard in the United States” (Kick, Fraser, Fulkerson, McKinney, & Devries, 2011). Universal agreement appears to exist that flooding is the most frequent and costliest natural hazard this country and is a component of a significant number of presidential declarations and disasters (King, 2008; Brody, Zahran, Maghelal, Grover, & Highfield, 2007; FEMA, 2011d; Salveson, 2003). FEMA’s Administrator, Craig Fugate, considers that “Flooding is the most costly and prevalent natural risk in the United States” (Fugate, 2011, p. 2). Sources of flooding include coastal storm surges associated with hurricanes and other wind events; riverine flooding; flooding caused by dam, levee, or other structural failures; snowmelt; and flash flooding in areas of steep terrain or alluvial fans.

The extent of the impact and costs of flooding is largely a function of where people live—in areas prone to flooding by way of proximity to bodies of water or near flood control structures that hold back bodies of waters. While an estimated 53% of the population now live in coastal counties (Hodge, 2008), it is estimated that in the future, 75% of the population will live within 50 miles of a coastline (McMillan, 2007). Further, FEMA reports that 37% of the nation’s counties contain flood-control structures, such as dams and levees, and these counties contain 55% of the nation’s population (Jones, 2010). Living behind flood control structures that by definition are not fail proof equates to living at risk of flooding.

These demographics are exacerbated by increasing precipitation, both observed and projected. In the Northeast, for example, the region has witnessed a 67% increase in the amount of heavy precipitation events in the past 50 years (Centers for Disease Control and Prevention, 2010). The future portends a continuation or worsening of the same; the Quadrennial Homeland Security Review identifies climate change as one of the challenges facing the security environment in the future, and specifically, that it will “increase the severity and frequency of weather-related hazards such as extreme storms, high rainfalls, floods ....” (Department of Homeland Security, 2010, p. 7). It is estimated that this will cause precipitation events that historically have occurred every 20 years to occur every four to six year years (Karl, Melillo, & Peterson, 2009).

At a federal level, responding to and recovering from flooding events and disasters costs the Treasury billions in disaster assistance outlays, federal insurance payouts, and arguably, diverts resources and funding from homeland security endeavors. Specifically, “historically, floods have caused more economic loss to the nation than any other form of natural disaster” (King, 2008, p. 1). These costs are increasing over time even after adjusting for inflation. In the first decade of this century, yearly flood losses increased from \$6 billion to \$15 billion (New York State Floodplain and Stormwater Managers Association, 2010). For homeowners, the chance of incurring flood-related damages is not remote; one in four mortgages will experience flood damage during a 30-year mortgage (FEMA, 2011f).

Flooding affects the nation in ways other than economic. Consider the human toll in terms of lives lost; the National Weather Service observes that flooding fatalities have been increasing over the past 25 years (Ashley & Ashley, 2008).

Consider also the toll flood events take in terms of disruption and a community's ability to function. Witness recent events, such as the Midwest Floods of 1993 or 2008, Hurricane Allison (Houston), or Hurricanes Katrina and Rita, in which entire cities were incapacitated for extended periods of time, with loss of power and communication, incapacitated transportation sectors, compromised law enforcement, and severely diminished access to basic needs, such as food, water, and medicine. Whereby 50% of the nation's gross domestic product is derived from coastal watershed counties—the source of virtually all of the nation's hurricanes—flood-related disruptions to commerce in these areas are likely to have a significant impact of economy and trade (U.S. Commission on Ocean Policy, 2004).

Population trends—more people and development occurring near bodies of water—coupled with increased precipitation are converging to create the perfect storm. This thesis seeks to recommend measures to reduce the impact and costs of that storm.

## **C. PUBLIC POLICY INFLUENCES (PROBLEM STATEMENT)**

A claim of this thesis is that two public policies are influencing the impact and costs of flooding in this country. These policies are the National Flood Insurance Program and the Robert T. Stafford Act. This section outlines the conclusions—drawn from research and articulated further in the thesis, which the author has reached about these two programs.

### **1. The National Flood Insurance Program**

Simplistically, it would seem that reducing the impact and costs of flooding could be as straightforward as reducing development of coastal and flood-hazard areas or at a minimum, effectively managing development in flood-hazard areas to minimize damage from flooding. Indeed, the National Flood Insurance Program (NFIP) was created in large part to do just that. Critics argue, however, that the program was flawed from the start

and has evolved even more so to the point that the NFIP now actually promotes rather than constricts floodplain development, and as such, contributes to the impact and cost of flooding events. Critical arguments that the NFIP encourages floodplain development generally fall into three broad categories.

***a. The NFIP's Rate Structure***

The insurance premium rates paid by policy holders are subsidized by the federal government and do not always reflect the true level of risk. Critics argue that as a result, the NFIP does not provide an effective disincentive for floodplain development, but if property owners were required to pay the true actuarial rate of risk for their flood policies, they would be less likely to locate or continue to reside in flood hazard areas and would take more rigorous actions to mitigate their properties against the risk of flooding.

***b. Lack of a Penalty Structure***

Generally, a policyholder is not penalized for not acting to mitigate flood risk, e.g., to elevate or flood proof. In other words, no cap exists on the number of claims that the NFIP will reimburse a property owner, even if the owner does not take steps to mitigate.

***c. The NFIP's Intergovernmental Structure***

The NFIP is a quid pro quo national policy that relies on state and local communities for enforcement (Singer, 1990). In return for the ability of residents to purchase flood insurance, local communities must comply with the NFIP's floodplain management guidelines. Critics argue that the NFIP lacks sufficient authority to monitor enforce local enforcement of the NFIP's regulatory requirements. Further, broad evidence exists that local communities do not enforce floodplain management principles outlined by the NFIP.

It could be argued that the extent to which the policies of the NFIP may influence development of flood hazard areas is the extent that changes to these policies could reduce the impact and costs of flooding. As future chapters and discussions

illustrate and document, however, economic, political, and societal factors serve to undermine this argument. Economically and politically, jurisdictions often lack the will and resources to limit development and urbanization that may bring in needed tax revenues and jobs, even when such development is in a flood-hazard area. Economically, the NFIP cannot alter much of its subsidized rate structure due to citizen and political pushback, as well as a general public sentiment reluctant to bear the economic consequences of living in flood hazard areas. From a societal standpoint, two factors are at play: individual property rights and the evolving role of the federal government. From a property rights perspective, a notion exists—supported by law—that regulation (e.g., NFIP regulatory requirements) of one’s property to the economic determinant of the property owner is not acceptable in this country. As to the role of the federal government, the concern and sentiment also exists that the government’s role in providing disaster assistance has evolved to a point at which many people expect that the government will take care of them financially in the event of a disaster. On its face, this would nullify the need to purchase flood insurance.

While these forces serve to reduce the ability of the NFIP to influence effectively where people live and how development is managed, and thus, to *prevent* successfully the detrimental impact and costs of flooding, other forces are at play *after* flooding occurs that further influence the impact and costs of flooding events. In other words, generally, the repair and rebuilding activities that occur after a flooding event, during what is known as the recovery phase of disaster operations, are less than optimal because of provisions of national disaster assistance policies. What communities and homeowners do (or do not do) to repair or rebuild their communities and properties after a flooding event and whether or not they take steps to mitigate against future events greatly influences the impact and costs of future events.



## 2. The Robert T. Stafford Disaster Relief and Emergency Assistance Act

This act, hereafter referred to as the Act or the Stafford Act, is the policy venue through which federal post-disaster response and recovery efforts are effected. Provisions of this Act, in terms of both enforcement and incentives, influence the impact and costs of subsequent flooding events for a variety of reasons to be discussed.

From an enforcement perspective, the Stafford Act supports suboptimal repair and rebuilding efforts because it often requires that damaged structures be repaired only to their original condition; thus in flood zones, the same structure can be repaired to the original, presumably not flood proofed, condition without the requirement for undertaking mitigation efforts. Without retrofitting or mitigating the structure to withstand future flooding events, the cycle of flooding disaster continues indefinitely. Provisions of the Act provide for mitigation funding of public infrastructure during the rebuild process, but critics argue that this provision is infrequently applied in the interest of a “quick” recovery effort (FEMA Reauthorization: Cutting Red Tape in Recovery, 2011).

The Stafford Act imposes a reimbursement ceiling that dramatically reduces the amount of financial assistance a structure would receive if the frequency of the third loss falls within a 10-year window *and* mitigation measures have not been taken for that structure. This provision has yet to be codified or implemented. Thus, not only are flood-damaged structures often repaired or restored to their original condition, but the structures also receive federal assistance to rebuild without any penalty for failure to mitigate the structure.<sup>1</sup>

One of the incentive-based programs promulgated by the Stafford Act is the Hazard Mitigation Grant (HMG) Program. The program funds mitigation grants aimed at taking steps to reduce the impacts of future disasters. Critics argue that the program is less than optimal because of the 25% contributory match required by the local or state jurisdiction. In recent years and within the framework of a troubled national economy—with state and municipalities similarly struggling with fiscal capabilities—the ability to

---

<sup>1</sup> Exceptions do occur under the NFIP substantial damage/substantial improvement provisions.

meet this 25% match is increasingly difficult. The result is that not all available mitigation funding may be realized and where realized, the mitigation activity occurring may be based on the availability of local match funding, not necessarily where the greatest need may exist. Adding to these difficulties is the financial reality that communities that opt into the program's popular buy-out program, e.g., buying out individual residences in flood-prone areas and restoring the area to green space, do so at the expense of losing a source of tax revenues, and as a result, may be reluctant or financially unable to participate in the buy-out programs.

Lastly, critics argue that the way the HMGP is managed, in a top-down federal to state structure, may lend to perceived bureaucracy (Berginnis, 2011) and a loss of sense of ownership (Wright, 2000) that may make state management of the program suboptimal. Where ownership and buy in of a program is lacking, it follows that the program may not be optimized to its intended realization.

In conclusion, the combination of these two federal programs, the NFIP and Stafford Act, while well intended, serve to influence the cost and impacts of flooding events by promoting floodplain living—the NFIP, and suboptimal post-flood recovery efforts—the Stafford Act. While political, economic, and societal factors serve to negate the likelihood of substantially changing the NFIP, feasible opportunities appear to exist to modify the Stafford Act toward an end of reducing the impact and costs of flooding events.

#### **D. THE NEXUS TO HOMELAND SECURITY**

As demonstrated, flooding exacts a toll on the nation in many ways: economic, degradation of commerce, lives lost, property damage, and the capacity of communities to continue normal community functions. From a homeland security perspective, why does this matter?

Before examining this question, it may serve useful for the reader to have insight into this author's definition of homeland security. While many definitions exist, from narrow to parochial to broad, this author has adopted a broad, all-hazards definition as described by Bellavita:

Homeland Security is a concerted national effort to prevent and disrupt terrorist attacks, protect against man-made and natural hazards, and respond to and recover from incidents that do occur. (Bellavita, 2008, p. 2)

While some may argue that homeland security is terrorism based only, this author includes natural hazards, to include flooding, as a factor impacting homeland security.

Thus, flooding and its impact matters because communities form the core capabilities of the nation with respect to responding to catastrophic events, be they terrorist, manmade, or natural hazards. Communities and their resources are what the nation draws on in the event of a threat to the nation. Clarke and Chenoweth point out that communities:

Represent the greatest concentration of resources and personnel available to respond to attacks [or catastrophic events], the greatest concentration of health and human resources, and the sites for the most equipment and infrastructure needed to protect and respond in cities. (Clarke & Chenoweth, 2006, p. 6)

It follows then, that anything that reduces the capability of a community to respond to a catastrophic event or terrorist attack or that increases the vulnerability of a community to an attack or catastrophic event directly impacts homeland security.

Waugh (2006, p. 289) best argues the nexus between disasters, to include flooding, and homeland security, by depicting the weeks following Hurricane Katrina, “Had a major earthquake or terrorist attack occurred during those weeks the response capacities of the federal government might also have been overwhelmed.”

The impact and costs of flooding is related to the concept the resiliency that in turn reflects the ability of the nation, by way of its communities, to respond to and recover from catastrophic events:

Achieving resiliency in a disaster context means the ability to survive future natural disasters with minimum loss of life and property, as well as the ability to create a greater sense of place among residents; a stronger, more diverse economy; and a more economically integrated and diverse population. (Berke & Campanella, 2006, p. 192)

At a minimum, the nexus between homeland security and flooding is financial. The billions spent on disaster relief efforts—that are in large part preventable in the case of flooding—are funds that could be spent on other homeland security endeavors. Similarly, flooding diverts attention, focus, and resources from homeland security concerns, for example terrorist threats, to domestic flooding concerns.

If, as the demographic trends cited earlier indicate, more people will be living in flood-prone areas and the likelihood of precipitation is expected to increase, then it follows that the nation’s homeland security is destined to continue to be compromised, likely increasingly so.

It is for these potential impacts of flooding to homeland security, coupled with the economic and loss of life tolls imposed by flood damage, that warrant further research by way of this thesis in terms of alternatives and solutions.

#### **E. RESEARCH QUESTIONS**

1. Would changes to enforcement provisions of the Stafford Act reduce the impact and costs of flooding?
2. Would changes to incentive provisions of the Stafford Act reduce the impact and costs of flooding?
3. Are there changes to how FEMA administers mitigation elements of the Stafford Act that would streamline the program and increase the likelihood of state and local buy in of mitigation efforts toward an end of reducing the future impact and costs of disasters?

#### **F. LITERATURE REVIEW**

This literature review outlines research and commentaries on the impact and costs of and potential solutions to flooding events. The research is delineated into five categories.

1. The impact and costs of flooding events
2. The NFIP’s influence on the impact and costs of flooding
3. The Stafford Act’s influence on the impact and costs of flooding

4. Approaches and suggested solutions to reducing the impact and costs of flooding
5. The evolving role of the federal government and how it influences the impact and costs of flooding.

## **1. The Impact and Costs of Flooding**

The literature reflects ample data quantifying the impact and costs of flooding by utilizing data ranging from property damage losses, fatalities, and influence on community stability. The literature reflects that at the first half of the 20th century, damages related to floods averaged \$3 billion per year (Weiss & Goad, 2009) whereas in the first decade of the 21st century, yearly flood losses have increased from \$6 billion to \$15 billion (New York State Floodplain and Stormwater Managers Association, 2010). Brody et al. (2007) provide a detailed analysis of flooding costs in terms of economics and damage. However, some disagreement exists concerning the data supporting the consensus that the impact of flooding has increased, and Downton Miller, and Pielke (2005) conducted a large study reanalyzing National Weather Service statistics related to damage estimates and fatalities.

These financial costs have a second-order financial impact via the NFIP and claim payouts. Designed to be self-sufficient with policy premiums covering the cost of claims payouts, Government Accountability Office (GAO) (2010b) reports that the NFIP is in the red, with more funding paid out in claim payments than in insurance premiums received. In testimony before Congress in 2011, FEMA Administrator Craig Fugate reported that the NFIP is \$17.5 in debt, and that it is unlikely that FEMA will be able to pay off the debt (Fugate, 2011). The result is that this cost will likely be passed on to taxpayers.

In terms of fatalities, Ashley and Ashley (2008) cite that flood fatalities have generally increased during the past 25 years as compared to the middle part of the 20th century; the deaths associated with the catastrophic events of Hurricane Katrina and Rita are not included, which are estimated to be over 1,800 (Kick et al., 2011). Zahran, Brody,

Peacock, Vedlitz, and Grover (2008) report that from the period 1960 to 2005, more people were killed from flooding events than from earthquakes, hurricanes, or tropical storms combined.

Ample literature points to the expansion of floodplain development and urbanization as a causal factor in the impact and costs of flooding. Powell and Grunwald (2005) point out that in 1960 180 people lived per square mile in the coastal United States, and by 1994, 275 people per square mile. Hodge (2008) points to NOAA's estimate that 53% of the U.S. population now lives in a coastal county and others project this percentage is increase to as much as 75% (McMillan, 2007).

Several authors discussed the linkage between the impacts of flooding and homeland security although a comparatively small amount of literature exists on this aspect of flooding, presumably because the notion of homeland security is barely a decade old. However, several scholarly authors do frame floodplain development and urbanization within the homeland security framework of resiliency, sustainability, and vulnerability. Flynn (2007) urges community resiliency through being adaptive, to apply lessons learned from previous disasters, and to not adopt a "business as usual" posture by rebuilding homes on floodplains. Godschalk (2003) makes the explicit link between resiliency and terrorism by outlining how proactive natural hazards management (of which flooding is a key component) enables community resiliency. Clarke and Chenoweth (2006) argue that communities are the U.S.'s greatest resource in fighting terrorism and that not mitigating risks, such as flooding reduces a community's resilience and the ability to bounce back from disasters—natural or terrorist.

## **2. The NFIP's Influence on the Impact and Costs of Flooding**

The literature reflects broad agreement that the costs and impacts of flooding are relatively high and many link this to the NFIP, citing that since its inception in 1968, the NFIP has not met its stated goal of constricting floodplain development and reducing disaster costs.

Citing the NFIP as the causal link in this expansion into flood-hazard areas, Holladay and Schwartz (2010) argue that the NFIP actively promotes land use decisions

that lead to people living in flood hazard areas. Larry Larson, executive director of the Association of State Floodplain Managers, when referring to the NFIP, echoes this belief, “Right now, our national approach is, we’re going to show you the high-risk area and then show you how to build there” (Davidson, 2005, p. 389). The National Wildlife Federation (2010) opines in a similar vein that FEMA is subsidizing and encouraging high-risk floodplain development.

Critics put forth many reasons why the NFIP has been unsuccessful in its attempt to constrict floodplain development, and hence, flooding impacts and disaster costs. The Congressional Research Service (King, 2005, 2008, 2009, 2010, 2011) argues that the NFIP rate structure does not reflect the true level of risk; in other words, rates are not actuarially based and may inadvertently promote floodplain development. The Congressional Budget Office (2009) conducted an in-depth analysis of the NFIP subsidized rate structure as well. A report by the RAND Gulf State Policy Institute (Rand, 2010, p. 2) argues that because NFIP premiums do not reflect expected losses, “they do not provide appropriate incentives to avoid construction in high-risk areas.”

Others argue that the NFIP provides little incentive for property owners who repeatedly suffer flood losses to move out of the floodplain or mitigate because no historical, per-property loss ceiling exists. Put differently, structures that suffer repeated flood-related losses receive reimbursement for losses without penalty. Critics argue that this type of policy leads to development in the floodplains that might not have occurred absent the NFIP (Lehrer, 2008). While NFIP requirements to mitigate substantially damaged structures after a flooding event do exist, experts report that local governments do not consistently enforce this key NFIP provision. The seminal Galloway Report, produced after the Midwest Floods of 1993, discusses this issue in detail, citing the lack of enforcement of this provision as a causal factor in the impacts and costs of flooding (Federal Interagency Floodplain Management Review Committee, 1994). Other critics also point to the lack of enforcement authority within the structure of the NFIP (Wright, 2000). Burby (2006) suggests that the current orientation of the NFIP toward individual

flood losses has prompted communities to develop flood-risk areas while individuals, as opposed to the communities issuing the building permits, bear the brunt of flood-related losses.

Others argue that some aspects of the NFIP are indeed working and working well. One program often cited as successful is the NFIP's Community Rating System program. Zahran, Brody, Highfield, and Vedlitz (2010) published the results of a longitudinal study of 214 Florida communities that participate in the Community Rating System. The key finding of the study is that the CRS system works to compel more mitigation efforts on the part of a community. Another area cited as working well is the program's flood risk identification by way of flood insurance studies resulting in flood insurance rate maps. The agency's Map Modernization Initiative has been successful in modernizing the nation's flood maps inventory. By April 2008, 58 percent of the nation's maps were more than 10 years old as opposed to 70% just four years earlier (Government Accountability Office, 2008c). As of March 2011, FEMA Administrator Fugate reported to Congress that 88% of the nation's maps had been updated (Fugate, 2011).

### **3. The Stafford Act's Influence on the Impact and Costs of Flooding**

Moss and Shelhamer (2007) describe The Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121et seq as the nation's principal legislation for how the federal government responds to disasters within the United States. Dubbed the "Magna Carta" of disaster relief (Cooper, 2010, para. 4), the program provides for public assistance, individual assistance, and mitigation opportunities after natural disasters, to include flooding. A key component of the Act is the mitigation grant program known as the Hazard Mitigation Grant (HMG) Program, which provides for grants "to significantly reduce or permanently eliminate future risk to lives and property from natural hazards" (FEMA, 2007, table 1).

The literature reveals significant discussions on the linkage between federal disaster assistance and the impact and costs of disasters and flooding. As early as the Nixon administration, concern existed that the federal assistance was "replacing rather than supplementing" nonfederal efforts (Olasky, 2006, p. 40). Platt (2000) discusses



policy reviews linking the availability of disaster assistance to decreased self-reliance and increased risk taking. Wright argues: “The dominant federal role in funding flood damage reduction and recovery activities limits the incentive for many state and local governments, businesses, and private citizens to share responsibility for making wise decisions concerning floodplain activity” (Wright, 2000, p. 81). A near-universal theme in the literature is that federal disaster assistance, which the Stafford Act is considered, provides a disincentive for mitigation efforts to be undertaken. Boisvert and Rettger (1979) conducted an analysis that supports the argument that the availability of disaster assistance reduces a homeowner’s likelihood of taking mitigation actions in anticipation of a flooding event. In its review of barriers to coastal hazards planning, the National Oceanic and Atmospheric Administration Coastal Services Center (2010, p. 2) opined that “the substantial increase in Federal disaster assistance funds may prevent communities from taking necessary precautions in high-risk areas.”

Berke and Campanella (2006) criticize the way in which hazard mitigation plans, under the auspices of the Stafford Act, are suboptimal because they are hastily done in a post-hazard environment and without well-thought out strategies. Rovins (2009) similarly critiques this planning process and argues that while meant to serve as a comprehensive means to identify and mitigate against risk, plans are done in a perfunctory, “check the block” environment solely as a means to receive federal disaster funding. Others, however, point to the success of these planning efforts. Brody, Kang, & Bernhardt (2010) conducted a study of Texas and Florida flood mitigation efforts that reveals that comprehensive planning plays a key role in strengthening the flood programs of a community.

The literature discusses the reforms to the Stafford Act, including the Disaster Mitigation Act of 2000, the Post-Katrina Emergency Management Reform Act (PKEMRA) of 2006, and current internal and external reforms. GAO (2008a) conducted a review of the impact of PKEMRA on disaster relief for public infrastructure. In 2007, the Association of State Floodplain Managers (ASFPM, 2007, p. 13) called for limiting

public assistance funding to communities that do not mitigate for future flood events: “All taxpayer-funded flood disaster relief should be contingent upon taking flood mitigation action where feasible—whether public or private.”

Still others point to shortfalls in the Stafford Act’s HMGP, citing impediments to mitigation factors, such as the perceived red tape and bureaucracy of the program. The Stafford Act Reform Task Force (The United States Conference of Mayors, 2010, p. 2) recommended more consistent methodologies and reduced bureaucracy: “The entire hazard mitigation grant process should be streamlined so less funding is spent on complex and bureaucratic administration and more on the actual construction of safer structures.” Evans cites the concerns of the Louisiana Recovery Corps: “the rigidity of the Act and its voluminous amendments has certainly served to handcuff those federal agents, officers, and agencies working under its oversight” (Evans, 2009, para 7). Others express concerns about the HMGP’s non-federal match requirement (25% of the grant) and difficulties with local jurisdictions and citizens being able to afford the match, particularly in what are currently difficult economic times. Evans (2009) similarly points to the slow pace of receiving the federal portion of the HMGP as a factor that slows recovery efforts, and as such, impedes post-recovery mitigation efforts.

Still others tout the effectiveness of the HMGP. While pointing to shortfalls in the HMGP, Mayor Nagin with the Stafford Act Reform Task Force acknowledged that the program’s “hazard mitigation measures have proven to be effective in reducing property damage, costs of repair and replacement, and loss of Life” (The United States Conference of Mayors, 2010, p. 2). The Association of State Floodplain Managers penned a 2006 white paper touting that “The Association of State Floodplain Managers (ASFPM) fully supports the Federal Emergency Management Agency’s (FEMA’s) hazard mitigation efforts and programs” (Association of State Floodplain Managers, 2006, p. 1). Testifying before Congress in 2003, the National Emergency Management Association (NEMA) outlined numerous examples demonstrating the effectiveness of the HMGP (Review of the General Accounting Office Report on FEMA’s Activities after the Terrorist Attacks

on September 11, 2001, 2003). Citing the success of property buy out programs (many under the auspices of the HMG program), FEMA reports that since 1993 over 20,000 properties have been removed from the floodplain (FEMA, 2010c).

#### **4. Approaches and Suggested Solutions to Reduce the Impact and Costs of Flooding**

The literature reflects universal agreement that the NFIP should be reformed with an abundance of literature dating from the inception of the program in 1968 to current legislative attempts to reform the program. The rate of literature production about NFIP reform or effectiveness has been constant over the years, with a significant flurry of protests and reforms articulated in the aftermath of Hurricane Katrina.

Government reviews of the NFIP discuss the detriment that rate subsidies have on floodplain development. The Government Accountability Office (2008d, 2010b) argues that the NFIP rate structure does not reflect the true level of risk and proposes several ways to change the rate structure to address the subsidies. Andrew Young with the University of Mississippi Department of Economics (2008) was one of the few non-federal entities to espouse eliminating NFIP rate subsidies, arguing that failure to price premiums commensurate with the level of flood risk provides incentive to live in flood-hazard areas.

Critics also argue for changing the NFIP's Community Rating System (CRS). In exchange for taking additional efforts to mitigate against the risks of flooding, communities participating in the NFIP are able to reduce the NFIP premiums their constituents pay in exchange for effecting certain mitigation measures, which is known as the Community Rating System (CRS). Zahran et al. (2010) published the results of a longitudinal study of Florida communities that participate in the CRS. The key finding of the study is that the CRS system works to compel more mitigation efforts on the part of a community, but the authors provide suggestions for improvements to the system. McMillan (2007) also explores the CRS issue and suggests that the CRS-reduced premium is not correlated to reduced risk.

The literature reflects ample calls for imposing a cap on reimbursement for repetitive losses, citing that the NFIP provides no disincentive for properties that repeatedly suffer flood losses; no historical, per-property loss ceiling exists. Structures that suffer repeated flood-related losses receive reimbursement without penalty. In other words, a homeowner is not penalized for not acting to mitigate flood risk, e.g., to elevate or flood proof. Critics argue that this type of policy leads to continued and further development in the floodplains. Burby (2006) opines that limiting repetitive loss payouts would induce homeowners to take active steps to mitigate against future losses. Taxpayers for Common Sense, (Subcommittee on Insurance, Housing and Community Opportunity Committee on Financial Services, 2011) argued before Congress that this repetitive loss problem accounts for a disproportionate amount of losses to the NFIP.

Ample research exists on the topic of repetitive flood losses with the two main producers being the Congressional Research Service and the GAO, which King (2005) has researched and who makes recommendations to reduce the number of repetitive loss properties; however, some of the basis for his research is dated, for example, a 1998 Fish and Wildlife Study. A more recent GAO report (2010b) reports that repetitive loss structures represent 1% of policyholders yet account for up to 30% of the claims. This report suggests that the NFIP should make mitigation criteria more stringent, for example, limiting or eliminating insurance payouts to property owners who repeatedly fail to act to mitigate their repetitive loss property. The Galloway Report (Federal Interagency Federal Floodplain Management Task Force, 1994) suggests that FEMA develop a strategy to address the repetitive-loss problem and recommends including increasing deductibles on insurance policies.

A good deal of the literature pertaining to reforming the NFIP suggests strengthening the compliance and enforcement aspects of the NFIP. The NFIP is a quid pro quo national policy, which relies on state and local communities for enforcement (Singer, 1990). The NFIP imposes mitigation-based building code, elevation, and land-use requirements on communities in exchange for community enrollment in the NFIP, and thus, allowing residents to purchase national flood insurance. However, broad agreement exists in the literature that communities have not consistently met their end of

the bargain—mitigation and land use enforcement—because of political constraints, lack of will, lack of resources, or lack of technical expertise. Griffith (1994, p. 742) argues succinctly, “The NFIP lacks any firm stick to ensure proper implementation of the program by local authorities.” The New York State Flood Plain Managers Association (2010) recommends that a way around this dilemma is to require that the NFIP stipulate that an entity outside of the local jurisdiction approve floodplain development projects. The Galloway Report (The Federal Interagency Floodplain Management Task Force, 1994) similarly suggests strengthening NFIP enforcement provisions but acknowledges inherent difficulties in doing so. Burby (1998, p. 60) points to various studies conducted that examine the reluctance of local officials to impose NFIP regulatory requirements and “noteworthy gaps in local policy adoption of land use measures” for reducing risks caused by floods and other natural hazards.

Yet others suggest expanding the NFIP to include land-use restrictions. Holway and Burby (1990) suggest that the elevation and flood proofing requirements of the NFIP fall short of the intent of the original NFIP legislation; that is, to discourage building in floodplains altogether, and offer that the NFIP should also include land-use requirements that prohibit building in flood zones. Godschalk (2003) suggests similar land-use reforms within the NFIP. The Association of State Floodplain Managers (Larson & Plasencia, 2001, p. 175) recommends implementing a “no adverse affect” land use policy in which “a no adverse impact floodplain is one in which the action of one property owner or community does not adversely affect the flood risks for other properties or communities....”

While some point to reforming the NFIP to reduce the impact and costs of flooding, others point to changing national disaster assistance policies. A moderate amount of literature exists arguing that national disaster assistance policies undermine the viability of the NFIP (why buy insurance if the federal government will bail you out?) (McConkey, 2011), encourage people to live in high-risk flooding areas, provide incentives to communities to rebuild in flood-hazard areas, and reduce individual homeowner incentive to undertake mitigation efforts, e.g., elevation measures or flood proofing. Wright (2000) argues that disaster assistance should be restricted to those who

have taken active measures to mitigate against flood damage. Calling for a Natural Defense Policy, U.S. Representative (Oregon) Blumenauer argues that the federal government should relook its programs that encourage citizens to return to normal and reoccupy areas damaged by disasters: “Putting people in harm’s way repeatedly ought not to be a way of life” (Sawyer & Tuchman, 2010, p. 1).

Berke and Campenella (2006) argue that local government eligibility for federal disaster aid and mitigation grants should be contingent upon incorporating a land use element as part of the community’s hazard mitigation plans, and that the land use element must comply with a checklist of steps that specify risk avoidance opportunities that rely on land use planning. Examples include pre-identifying communities or areas for relocation to a pre-designated area after a flooding event. These authors similarly propose requiring communities to purchase infrastructure insurance. A simple yet often overlooked concept is to involve citizens in what the National Emergency Management Association (NEMA), (2009) describes as grass-roots mitigation initiatives demanded by the citizens they are intended to help (Berke & Campenella, 2006, n.p.) argue similarly, “When citizens start to grasp the more resilient and sustainable alternatives for living with hazards, they mobilize and begin to insist that elected officials make decisions leading to long-term resiliency.”

Streamlining mitigation programs, the majority of which fall under the Stafford Act umbrella, is recommended by GAO (2010a; 2008b), and the Stafford Act Reform Task Force (2010) recommends extending mitigation grant application periods and standardizing benefit cost ratios to streamline and facilitate post-disaster mitigation grant programs. The National Emergency Management Association (NEMA), (2009, p. 5) argues that emphasis on incentives versus punitive measures may be more effective in the creation and delivery of mitigation programs, “Mitigation will be more successful in the future if it becomes embraced as wise and beneficial public policy as opposed to a directive or punitive imposition of government.”

Still others explore the concept and practice of buying-out properties that have withstood repetitive or substantial losses after a flooding event. Kick et al. (2011) conducted an in-depth study into the behavior of owners of repetitive loss properties. In

2009, the Congressional Research Service (Love, 2009) reports on the effectiveness of buyout programs but also points to factors that inhibit buyouts, e.g., affordability and the lag in time between the flooding event or disaster and grant program availability. White (2011) conducted a comprehensive review of flood buyouts in Shepherdsville, Kentucky, citing \$99M in losses avoided as a result of the buyouts.

While not discussed as frequently as other reform measures, the literature does reflect strong support for reducing the impact of flooding via improved mitigation planning at all levels of government. This theme takes many forms, including Godschalk's (2003) suggestion for a national sustainable mitigation policy and Burby's (2006) idea of amending the Disaster Mitigation Act of 2000 to require plans mandated under DMA to be integrated with existing state and local mitigation plans. Overall, the literature reflects a premise that failure to plan on specific flood mitigation measures prior to an event leads to post-disaster mitigation efforts that are "hastily prepared during the disaster recovery period rather than before the event when there is time to prepare well-conceived plans... resulting in mitigation efforts that are "scattershot and not based on clear and consistent mitigation...priorities" (Berke & Campanella, 2006, n.p.)

What community and emergency management officials describe as the bureaucracy of the Stafford Act disaster assistance programs is cited often in the literature as an impediment to the recovery process and mitigation efforts. Sean Reilly, a member of the Louisiana Recovery Authority opines that, "The disconnect has been in implementation. When you look at the Stafford Act and the bureaucratic red tape that it requires, it's stunning, and it needs to be reformed ..." (Reilly, 2009, para. 4). In 2011, in testimony to Congress the Association of State Floodplain Managers argued similarly about the need to remove the perceived bureaucracies within the Stafford Act, particularly the Hazard Mitigation Grant Program (HMGP) (Berginnis, 2011).

## **5. The Role of the Federal Government and Its Influence on the Impact and Costs of Flooding**

A recurring theme in the literature is the shifting role the federal government has played in disaster preparedness, mitigation, and assistance, and how that has affected the impact and costs of all disasters, particularly flooding.

In the early history of this nation, the federal government played little or no role in protecting citizens from flooding or indemnifying them after a flooding or other disaster event. Hoover (2005, p. 1) opines that “As was the case with many policy areas, disaster relief in the United States was considered a state and/or local matter—if not a private voluntary charitable one—for much of the country’s history.”

In the 1930s, the federal government began to focus on structural means to control flooding. Structural flood control means includes but is not limited to dams, levees, floodwalls, and retaining basins. Critics argue that this approach encouraged living in unsafe areas. Kahan, Wu, Hajiamiri, and Knopman (2006, p. 7) argue with regards to structural flood control mechanisms that “Decision makers and the public tend to be over confident about engineering solutions because the solutions appear to offer substantial protection along with economic development benefits.” Pinter (2005) argues that while flood control structures avoided over \$19B in losses after the 1993 Midwest floods, the truth of the matter is that development in the respective floodplains would not have occurred if the government-provided flood control structures were not put in place. Highfield and Brody (2006) argue similarly that the existence of structural flood control mechanisms in a community tends to encourage development in an area that would not be developed absent the structure. Kunreuther, Meyer, and Michel-Kerjan (2009, p. 10) discuss what is known as the levee effect, and compelling evidence by Burby (2006) “that actions taken by the federal government, such as building levees, make residents feel safe when, in fact, they are still targets for catastrophes should the levee be breached or overtopped.”



In the 1950s, the role of the federal government in disasters began to expand with the passage of legislative acts that continued into the 1960s. Hogue and Bea with the Congressional Research Service (2006, p. 11) report that in “The gap between civil defense and natural disasters narrowed during the Administration of President Richard M. Nixon.” Concurrent to this trend was the establishment of the National Flood Insurance Program in 1968, which sought to “transfer at least some of the costs of disaster assistance from general taxpayers to those who live in flood-prone areas and to ensure that future development in flood-prone areas meets minimum standards for flood-resistance” (Salvesen, 2003, p. 7). This trend continued through the 1970s and 80s with the establishment of the Federal Emergency Management Agency and the promulgation of the Stafford Act.

Critics argue that this centralization of responsibility at the federal level has resulted in a shifting of the burden of responsibility from the individual to the federal government resulting in misinformed or misplaced perceptions about risk, and at worst, devastating results. Burby (2006) describes this situation as the “safe development paradox” whereby by trying to make areas appear to be safe, by way of dams or levees or the existence of heavily subsidized federal flood insurance, the government has made these unsafe areas even more unsafe by encouraging development. King with the Congressional Research Service (2008, p. 11) argues similarly that the combination of the NFIP coupled with the financial assistance provided by the Stafford Act encourages “too many people to locate in areas susceptible to flood damage, and leads to flood victims’ reliance on federal disaster assistance for uninsured losses.” With regards to the NFIP, (Brody et al., 2007, p. 342) argue that the NFIP “offers a perverse incentive to reside in higher-risk areas.”

Much discussion exists in the literature of the moral hazard that a federal insurance program, such as the NFIP, encourages. Hale (2009, p. 1) describes a moral hazard as “the danger that, in the face of insurance, an agent will increase her exposure to risk.” Both Hale and Wildasin extend this moral hazard to all federal disaster aid. Wildasin (2008) argues that the current role of the federal government in disaster assistance has created a moral hazard for state and community governments. Kahan et al.

(2006, p. 33) argue that governmental protection has “shifted what perhaps should be a private burden to the public sector.” Others argue that the role of government in disaster assistance has evolved to the point that it is now the insurer of first resort (Gaul & Wood, 2000).

Birkland and Waterman (2008, p. 693) speak to a coercive and opportunistic form of federalism policy that is “coercive in that it attaches strings to federal preparedness aid.” In the wake of Hurricane Katrina, however, others argue that the centrality of federal intervention on large and enduring scale is important, “A federalist approach to disaster response for a nation like the United States, with its vast population, wide geographical area, diverse regional conditions, and traditions of strong state and local governments and volunteerism, is the only practical choice” (Carafano & Weitz, 2006).

## **6. Conclusion**

The breadth of pertinent literature reviewed is extensive, including Congressional testimony, GAO reports, and Inspector General reports, as well as scholarly journals within the genres of urban planning, natural hazards management, insurance, risk management, economics, and social sciences along with literature and studies from universities and private organization studies, e.g., the American Association of Floodplain Managers and the RAND corporation. Also reviewed were the content and results of symposiums and forums, e.g., national flood policy forums and the Federal Interagency Floodplain Management Review Committee. A substantial number of law review articles were also part of the research. Generally, the literature was objective and did not indicate political or subjective biases with the exception of some Wildlife Federation articles and post-Katrina articles. Gaps in the literature include an observation that while a majority of the literature was relatively current—generated in the last 10 years—a significant amount of the literature dated from the 1980s. Additionally, in some areas, such as the scholarly examination of NFIP rate subsidies, sources were available from the federal sector exclusively, with a gap in the availability of private sector or corporate reviews.

## **G. HYPOTHESIS**

The claim of this thesis is that the primary policy venue designed to reduce the impact and costs of flooding has failed, the National Flood Insurance Program. However, changes to provisions of the nation's primary disaster assistance relief program, the Stafford Act, have the potential to increase and expand the ability and requirement of communities to take measures during the recovery phase of disaster operations to mitigate the impact and costs of future flooding events. Implementing these measures have the potential to impact and costs of future flooding events and increase a community's resiliency in future flooding events. Expanded nationally the homeland security posture of the nation will improve. The evidence to support this claim is derived from a policy options analysis examining the changes necessary to improve post-flooding mitigation efforts within the recovery framework.

## **H. SIGNIFICANCE OF RESEARCH**

This thesis adds to the literature in that much of the literature aimed at reducing flooding and its impacts is framed within the parameters of the NFIP. These changes generally require legislation changes and the current political and economic climate renders these changes as not fully feasible.

The immediate consumer of this research is the Federal Emergency Management Agency in that this is the agency that must champion and eventually adopt the changes recommended in this thesis, as well as the local and state stakeholders who will be the entities implementing the options offered in this thesis.

The ultimate benefactors of this research are the taxpayers who, if the impact and costs of flooding are reduced, will see less of their tax dollars go toward flood disaster assistance. The most important benefactor is the son, daughter, mother, father, brother, or sister whose life is saved or whose family home is protected because of actions taken to reduce the impact of flooding.

## **I. METHODOLOGY**

The evidence to support the claim that changing provisions of the Stafford Act has the potential to reduce the impact and costs of flooding is derived from a policy options analysis. The analysis examines proposed changes to the Act designed to reduce flooding impacts and costs. The policy options analysis methodology was chosen to evaluate alternative courses of action, via the Stafford Act, to address that which the NFIP is unable to resolve satisfactorily, reducing the impact and costs of future flooding events.

The courses of action evaluated include examining both the incentive and enforcement aspects of the Act, as well as changes to the administration and complexity of the program. The criteria used, as well as the scoring mechanism, are reflected in the matrix shown in Table 1. Table shows the results of the analysis of the policy options conducted in Chapters V, VI, and VII.

The author wishes to inform the reader that this evaluative matrix and approach was created and designed with the acknowledgement that it does not constitute a rigorous scientific inquiry to evaluating the policy options but is intended to serve as a general tool to guide the analysis of the policy options and to evaluate the options relative to each other. The criteria chosen are largely qualitative, and together with the scores assigned, reflect the author's research conducted as part of this thesis, as well as the author's professional experience. The author acknowledges the subjectivity of the criteria and scoring and that other researchers might approach this analysis with different criteria and scoring mechanisms and reach different conclusions as a result of differing professional backgrounds and biases.

Table 1. Policy Options Evaluation Matrix

<b>POLICY OPTIONS EVALUATION MATRIX</b>					
<b>CRITERIA</b>	<b>NUMERICAL SCORE</b>				
	<b>Less</b>		<b>↔</b>	<b>More</b>	
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Effectiveness	Results in no projected losses avoided	Results in minimal projected losses avoided	Results in moderate projected losses avoided	Results in significant projected losses avoided	Results in substantial projected losses avoided
Congressional Support	Highly unlikely	Somewhat unlikely	Equally likely and unlikely	Somewhat likely	Very Likely
Legality	Requires significant legislative change	Requires moderate legislative change	Requires minor legislative change	Requires change to code of federal regulations	Requires change to FEMA policy
Federal Costs to Implement and Administer	Significant increase in DRF expenditures	Moderate increase in DRF expenditures	Minimal increase in DRF expenditures	No change in DRF expenditures	Results in savings to the DRF
	Substantial increase in federal cost to administer	Moderate increase in federal cost to administer	Minimal increase in federal cost to administer	No increase in federal cost to administer	Reduction in federal cost to administer
Implementation and Administration Burden to State and Local Stakeholders	Substantially increases complexity	Moderately increases complexity	No change in complexity	Moderately reduces complexity	Significantly reduces complexity
	Requires substantial additional funding outlays	Requires moderate additional funding outlays	Requires no change in funding outlays	Moderately reduces funding outlays	Significantly reduces additional funding outlays

Table 2. Evaluation Scoring Results for All Policy Options

<b>EVALUATION SCORING RESULTS FOR ALL POLICY OPTIONS</b>				
<b>CRITERIA</b>	<b>POLICY OPTION 1: 3-Strike Rule</b>	<b>POLICY OPTION 2: HMG Match</b>	<b>POLICY OPTION 2: Reimburse for Tax Revenue Loss</b>	<b>POLICY OPTION 3: Bottom-Up Review</b>
Effectiveness (Projected losses avoided)	5	5	5	1
Congressional Support	1.5	1.5	5	4.5
Legality	4	4	5	5
Federal Costs to Implement and Administer (DRF expenditures and federal cost to administer, respectively)	3	3	4	4
	4	4	4	4
Implementation and Administration Burden to State and Local Stakeholders (How complicated and funding outlays, respectively)	2	2	3	3
	2.5	2.5	3	3
Social and Cascading Impacts	2.5	2.5	4	5
<b>SCORE (out of 40 available points)</b>	<b>24.5</b>	<b>24.5</b>	<b>33</b>	<b>29.5</b>

## J. OVERVIEW OF UPCOMING CHAPTERS

This thesis contains eight chapters. A brief review of the upcoming chapters follows.

Chapter II centers on the National Flood Insurance Program with an overview of its history, which is important because it illustrates how the program got to its present

state and how the forces that brought it to where it is now still exist. Additionally, key structural elements of the program are discussed in terms of how they influence the impact and costs of flooding. The research and arguments of the chapter leads the reader to a conclusion that the program has significant influence on the impact and costs of flooding, and because of political, economic, and societal reasons, little likelihood exists that the program can be reformed.

Chapter III focuses on the second public policy examined within this thesis, the Robert T. Stafford Act. In this chapter as well, the history of the Act is examined as it underscores the evolving role of the federal government in this nation's disaster assistance policies, and as future chapters discuss, this history may play a role in potential changes to the Act. Key aspects of how the Stafford Act influence the impact and costs of flooding are discussed as are specific measures for which the author leads the reader to the conclusion that these measures may lead to negatively influencing the impact and costs of flooding.

Chapter IV describes the methodology used to evaluate policy options presented in future chapters. Six criteria are identified as is a scoring mechanism and both are weighed against policy options described later in this thesis.

Chapter V outlines this thesis' Policy Option One. Policy Option One addresses the research question: Would changes to enforcement provisions of the Stafford Act reduce the impact and costs of flooding?

Chapter VI involves Policy Option Two. Policy Option Two is designed to answer the research question: Would changes to the incentive provisions of the Stafford Act reduce the impact and costs of flooding?

Chapter VII examines the final policy option of this thesis. Policy Option Three answers the research question: Are there changes to how FEMA administers mitigation elements of the Stafford Act that would streamline the program and increase the likelihood of state and local buy in of mitigation efforts toward an end of reducing the future impact and costs of disasters?

Chapter VIII is the final chapter of the thesis and ties together the findings of this thesis, provides recommendations for implementation of the policy options, and identifies areas warranting further research.



THIS PAGE INTENTIONALLY LEFT BLANK

## **II. FLAWED POLICY: THE NATIONAL FLOOD INSURANCE PROGRAM**

All insurance creates moral hazard, and flood insurance is no exception.  
— (Lehrer, 2008, p. 11)

### **A. INTRODUCTION**

The creation of the National Flood Insurance Program (NFIP) in 1968 represented the nation's first attempt to indemnify individuals against flooding disasters and their costs (Browne & Halek, 2009). Equally as significant, it marked a major shift in U.S. flood control policy away from a structure-based approach, e.g., dams, levees, etc., toward one based on risk identification, risk financing and floodplain management (Clary, 1985). The intent was to foster individual responsibility and build local self-sufficiency in terms of land-use, zoning ordinances, and construction standards (King, 2009). The end results sought were reduced disaster costs and less development in flood-prone areas. As this chapter shows, the NFIP has failed in reducing either disaster costs or floodplain development and that political, economic, and societal factors preclude much hope of reforming the NFIP to achieve what it was created to do.

The chapter is organized by first providing an overview of the NFIP followed by a review of the history of the program, a section on areas where the NFIP is not working, a section demonstrating areas where the NFIP is working, and an analysis outlining why it is likely the program cannot be effectively reformed.

### **B. OVERVIEW OF THE NFIP**

The National Flood Insurance Program is a quid pro quid program where a community agrees to adopt and enforce prescribed minimum floodplain management practices in exchange for the ability of that community's citizens to purchase flood insurance policies under the auspices of the NFIP. This purchase ability is special in that historically and currently, no or very few private insurers typically exist in the United States that sell flood insurance policies. The NFIP is administered by the Federal

Emergency Management Agency in its Mitigation and Insurance Directorate. The NFIP is more than just an insurance program, however, and is comprised of three main components.

### **1. Floodplain Identification and Mapping**

The original NFIP legislation required the identification and publication of all floodplain areas having special flood hazards and required the establishment of flood-risk zones, which was accomplished through flood insurance rate maps (FEMA, 2002). The current maps delineate 100-year and 500-year flood boundaries; flood hazards landward of levees; and special flood areas, which flood studies indicate would be impacted by coastal wave action and high-velocity storm surge actions. A property owner's location on a flood insurance rate map generally determines the level of flood risk, and unless the owner's property is grandfathered, reflects the level of premiums the property owner will pay.

### **2. Floodplain Management**

The NFIP requires participating communities to adopt minimum NFIP floodplain management practices. These requirements are based on the type of flood hazard risk in question. The requirements for a low-hazard riverine area are different from those of a high-hazard coastal area. Generally, these principles require a community to evaluate proposed construction to ensure it is reasonably safe from flooding and is constructed to minimize or eliminate flood damage (FEMA, 2002), and that substantially damaged structures are elevated or repaired to meet higher floodplain management principles. Enforcement of these practices is the responsibility of each participating community.

### **3. Flood Insurance**

The NFIP limits structural coverage to \$250,000 per structure for residential buildings and \$500,000 per structure for commercial structures. Contents insurance is also available for a maximum of \$100,000 for the contents of residential structures and \$500,000 for the contents of commercial structures. Commercial insurance agents sell the

policies and receive a stipend for their services. Policies are available only in communities or jurisdictions that formally participate in the NFIP. The program currently covers approximately 5.6 million households and businesses and insures over \$1.25 trillion in exposed risk (Fugate, 2011).

### **C. UNDERSTANDING THE NFIP BY REVIEWING ITS HISTORY**

The conclusion of this chapter is that little likelihood exists that the NFIP can be reformed for political, economic, and societal reasons. This author chooses to walk the reader through to this conclusion by outlining the history of the NFIP. By reviewing its history, the reader will observe how the forces of politics, economics, and societal shifts throughout its history have effectively undermined the NFIP's original goals of reducing disaster costs and reducing the impacts of flooding.

While the NFIP was officially enacted into law in 1968, the seedlings for the program started much earlier. A major impetus leading to the legislation of the NFIP was Hurricane Betsey, a Category 4 hurricane that made landfall in September 1965 and caused \$1 billion of damages, at the time an unprecedented level. Hurricane Betsey followed on the heels of other devastating hurricanes in 1963 and 1964, as well as heavy flooding in the upper Mississippi River in 1965 (King, 2005). The cumulative effect of damages and losses poised the nation for action. The Southeast Hurricane Disaster Relief Act (PL 89-339) was passed in 1965, which required the Department of Housing and Urban Development (HUD) to “undertake an immediate study of alternative programs which could be established to help provide financial assistance to those suffering property losses in floods and other natural disasters, including alternative methods of Federal disaster insurance...” (The American Institutes for Research, 2002, p. 8). Simultaneously, the Johnson Administration commissioned a task force, known as the U.S. Task Force on Federal Flood Control Policy, to provide recommendations to curb what was considered a growing trend of financial losses impacting the U.S. Treasury and to reduce the impact of flood losses to individuals. The commission's report, along with the HUD study, opined that a national flood insurance program was feasible, and as part of an integrated flood-management program, would serve to indemnify individuals against flood losses. As

importantly, the commission argued that such a program would provide an incentive to reduce new floodplain development, and where development already exists, provide an incentive to undertake abatement measures to reduce future losses. The studies envisioned that the success of a national flood insurance program would require a combination of federal, state, and local involvement with emphasis upon state and local efforts in effective planning in the use of flood plains (U.S. Congress, 1966a). The study's authors gave an ominous warning however about how the new flood insurance should be grounded:

A flood insurance program is a tool that should be used expertly or not at all. Correctly applied it could promote wise use of flood plains. Incorrectly applied, it could exacerbate the whole problem of flood losses. For the federal government to subsidize low premium disaster insurance or provide insurance in which premiums are not proportionate to risk would be to invite economic waste of great magnitude. (U.S. Congress, 1966b, p. 17)

While warning of the dangers of subsidies, the authors nonetheless acknowledged it would be reasonable to “grandfather” existing structures in high-risk flood areas, and further, projected through attrition and the natural rebuilding process that this subsidy would be necessary for only about 25 years (The American Institutes for Research, 2002).

The National Flood Insurance Act of 1968 (Title XII of the Housing and Urban Development Act of 1968 [PL 90-448]) created the National Flood Insurance Program. The NFIP incorporated many of the recommendations of the HUD study and offered the availability of federal flood insurance to communities that agreed to adopt and enforce floodplain management ordinances that meet minimum NFIP requirements (The American Institutes for Research, 2002). The Act stipulated that residents would become eligible for flood insurance after identification of flood-hazard areas (flood risk maps) and after the NFIP established actuarial rates. Residents of existing structures in a flood-hazard area would enjoy subsidized insurance premiums because presumably these residents were not aware of the flood risk when making their structure purchase. Future

residents, however, would not be offered subsidized rates because they would be made aware of the flood risk by way of the flood maps (Wright, 2000). The stated goals of the program were as follows (King, 2005).

- Reduce economic losses due to floods through flood insurance
- Encourage land-use controls at the state and local level to guide development out of flood prone areas
- Reduce federal costs associated with disaster assistance and flood control

It took several years for the program to develop, in part because the Flood Insurance Administrator did not have the capabilities to conduct flood risk studies, and thus, to more precisely define flood risk and flood hazard areas. The slow pace of the program was evidenced when Hurricane Camille made landfall on the Gulf Coast in 1969 and no one community affected by the storm was participating in the NFIP. When Tropical Storm Agnes struck the East Coast in 1972, the largest-costing national flooding disaster at that time (FEMA, 2002), less than 1% of insurable damages were covered by NFIP policies (The American Institutes for Research, 2002). As a result of less than robust participation in the program, in 1973, Congress authorized the lowering of subsidized premium rates by 37.5% in hopes that doing so would increase participation; it worked in that less than a year later, the number of policies in force was twice that of 1968 (American Institute for Research, 2002).

In March 1974, the Flood Disaster Protection Act of 1973 (PL 93-234), amending the National Flood Insurance Act of 1968, became effective and called for the following.

1. Mandating lending institutions to require holders of federally backed mortgages to purchase federal flood insurance—for those living in designated flood-hazard areas. This provision is known as the “mandatory purchase” requirement.
2. Lowering the premium rates to encourage broader acceptance of the mandatory purchase requirement. This provision is the second rate reduction in less than two years.
3. Conditioning the receipt of future federal disaster assistance upon communities participating in the NFIP and requiring these communities to “adopt adequate floodplain ordinances with effective enforcement provisions consistent with federal standards to reduce or avoid future flood losses.”

4. Repealing Section 1314 of the original Act, which called for denying disaster relief to persons who could have purchased flood insurance but did not do so. The rationale was that the provision was a disincentive to community participation.

The National Flood Insurance Act of 1968 was again amended by Title VII of the Housing and Community Development Act of 1977 (PL 95-128). This particular amendment removed the ban of federal disaster assistance to communities sanctioned by the NFIP for failure to comply adequately with the NFIP's minimum floodplain management principles. In the same year, Executive Order 11988 was promulgated, and it is key in that it requires federal agencies to "avoid direct and indirect support of floodplain and wetlands development wherever there is a practicable alternative" (U.S. Environmental Protection Agency, 1979, p. 2). FEMA's regulations implementing this order and Executive Order 11990, Protection of Wetlands, provided provisions to limit insurance coverage for certain structures in floodways and in V-zones, but in November 1980 FEMA published a notice of intent to not enforce these provisions (The American Institutes for Research, 2002).

Major reform came to the NFIP owing to the devastating 1993 Great Midwest Floods of the upper Mississippi and lower Missouri rivers. The floods created an estimated \$16 billion in damage and resulted in 505 counties being declared federal disaster areas (General Accounting Office, 1995). At the time, an estimated 10% of homeowners who suffered damage had flood insurance (Changnon, 2000). In response, Congress passed the 1994 National Flood Insurance Reform Act. This Act was significant in that it required including the condition that disaster victims receiving federal disaster assistance must purchase flood insurance and that this insurance must be maintained over the life of the structure, irrespective of ownership. It also required mortgage lenders of federally-backed mortgage to require flood insurance over the life of the loan codified the Community Rating System, a system whereby communities receive credits, by way of policy holder premiums, in exchange for undertaking advanced floodplain management actions; established a Mitigation Assistance Program to provide jurisdictions mitigations grants for mitigation plans and projects; and established the Increased Cost of Compliance (ICC) provision whereby individual property owners may

receive funding to comply with increased floodplain management requirements . The ICC coverage assists homeowners with flood mitigation efforts, such as elevating, flood proofing, demolishing and replacing structures. The 1994 Act also commissioned the Federal Interagency Floodplain Management Task Force, which in 1994, published a seminal report, still referenced today, known as the Galloway Report, after the Committee Chairman, Gerald E. Galloway (Interagency Floodplain Management Review Committee, 1994). The committee was charged with identifying the causes of the Midwest floods but equally as important, to evaluate and make recommendations to programs, activities, and policies that would result in risk reduction and economic efficiency with regards to floodplain management (Interagency Floodplain Management Review Committee, 1994). A key recommendation of the report was to “Reduce vulnerability of urban centers and critical infrastructure using floodplain management activities and programs” (Stakhiv, 2005, p. 4).

The next major reform to the NFIP came in 2004 by way of the Flood Insurance Reform Act of 2004, which was dubbed the “Two Floods and You Are Out of the Taxpayers’ Pocket Act of 2003,” because the Act sought to reduce repetitive flood losses of individual property owners. The Act established the repetitive flood claims and severe repetitive loss grant programs. The intent of the Act was to focus on mitigation and acquisition of properties that face repeated flood risks.

In 2005, the NFIP witnessed a watershed event by way of the size and extent of damage of Hurricanes Katrina and Rita, where nearly \$17B in claims on the program were made, exceeding by over a billion dollars, the aggregate of claims against the NFIP over its entire 40-year history (Maurstad, 2007). These claims plunged the program into a debt level that it still maintains to this day. It was at this juncture in history—in the face of devastating tragedies and damage—that many came out, however briefly, to support the need for the program.

Currently, the program is undergoing a major internal, two-year review, begun in 2009, under the direction of FEMA Administrator Craig Fugate. The initial goal of the reform is to gather concerns of stakeholders including insurance industry representatives, state and local administrators, floodplain administrators at all levels, and private sector



entities. The initial goal of the reform effort is to gather concerns of stakeholders and address the short-term “hot issues” issues (FEMA, 2011i). The group is expected to deliver its recommendation in late 2011 or early 2012.

Independent of the current internal FEMA NFIP reform efforts is a bill under the auspices of the House Committee on Financial Services, Subcommittee on Insurance, Housing and Community Opportunity. House Resolution 1309, the Flood Insurance Act of 2011 that takes a more aggressive approach than many previous legislative reforms in its intent to reform the NFIP and shift the burden of flood risk and losses to those individuals bearing the risk. Proposed reforms include the following.

- Differentiating the amount of deductibles between subsidized and nonsubsidized premium holders, with subsidized policy holders paying twice the amount of nonsubsidized policy holders
- An increase in premium rates up to 20% annually until rates reach actuarial levels
- Discontinuation of subsidized rates for policy holders whose policies lapse
- Grants designed to provide staffing for local building code activities

Will this bill survive and pass in its current form? As demonstrated by the historical analysis of the NFIP earlier in this chapter, it is likely that the bill will not pass in its current form. Indeed, a similar bill, with similar provisions for moving to actuarial rates, was passed in the House in 2010 but was not taken up by the Senate. As this year’s Mississippi and Midwest flooding portend record flood damages and heavy losses, it is unclear how the current legislation will fare.

At the other end of the spectrum, in February 2011, H.R. 435, The National Flood Insurance Program Termination Act of 2010, was introduced. The bill seeks to sunset the NFIP by 2013 to stop what the bill’s sponsor, Michigan Representative Candice Miller terms, making the state of Michigan the NFIP’s personal ATM, citing that Michigan residents pay significantly more in NFIP premiums than it receives in policy payouts (Miller, 2010). Miller also seeks to end all mapping of flood risk under the current FEMA mapping program.

## **D. WHERE IT IS NOT WORKING**

The reader will recall that the framers' stated goal for the NFIP was that it reduce economic losses, encourage states and local communities to institute controls to guide development away from flood-prone areas, and reduce flood-based disaster assistance costs. This author will demonstrate how the NFIP has failed in achieving these goals. A key premise of this thesis is that the NFIP influences the impact and costs of flooding. This section outlines the primary reasons—termed key weaknesses—why the NFIP has failed against this backdrop.

### **1. Key Weakness: Premium Rate Structure and Influencing Development**

The rate policyholders pay for their policies does not consistently reflect the true level of risk. In other words, premiums are not always actuarially based and proportionate to level of risk, which means policyholders often pay less for insurance than the level of risk would indicate. GAO (2008d, p. 11) reports that “the number of policies with subsidized rates is at its highest point since 1978, despite earlier expectations that the number of subsidized properties would decrease substantially.” FEMA officials advise that these subsidized policies experience five times more flood damages than do newer structures built to be compliant with floodplain management ordinances and principles (Czerwinski, 2001). How significant are these rates subsidies? FEMA estimates that if the subsidies were removed and actuarial rates imposed, the premium for “grandfathered” properties would increase two and a half times, and the premium for all policyholders would increase from 50% to 100% (Hayes & Jacobson, 2001). A major reason why NFIP subsidies exist dates to the underlying premises when the program was rolled out in 1968 and 1969. When the NFIP was established, the decision was made to grandfather in existing structures because presumably those living in flood hazard areas did not know they were living in flood hazard areas. This early “grandfathering” decision was also seen as a way to encourage early participation in the program and without inordinately

impacting existing floodplain citizens. Policy framers projected that the net cost of flood disasters (after factoring out NFIP revenues) would be reduced even with subsidized rates (King, 2005).

Another reason NFIP rates are not considered fully-risk based and financially sound is because the NFIP does not set premium rates much the way a traditional insurance company does. Rates are set based on a level of premium revenues that will fulfill what FEMA terms the “average historical loss year” where the level of premiums received “must accommodate the combined effect of the portion of NFIP business paying less than full risk premiums and the portion of the business paying full risk premiums” (King, 2005, p. 7). This methodology does not enable the agency to build up a financial reserves to cover years in which larger than average events or catastrophic events occur, such as Hurricanes Katrina and Rita in 2005 (Government Accountability Office, 2001).

One might ask, why do subsidies matter and how do they influence the impact and costs of flood events? A basic insurance premise is that the cost of insurance sends an economic signal to the risk taker about what is more risky and what is less risky. Governmental actions that interfere with this signal, e.g., governmental decisions to subsidize NFIP rates, distort the perception of risk (England, 1996). Critics almost universally argue that in the case of the NFIP, this distortion promotes living in flood prone and hazard areas and actually provides an incentive to live in flood hazard areas. A key tenet of the NFIP has been “To guide the development of proposed future construction, where practicable, away from locations which are threatened by flood hazards” (USC 42, 1968). The statistics support that coastal development has increased dramatically over the last 50 years, despite the goals of the NFIP to constrict floodplain development. Where 180 people lived per square mile in the coastal United States in 1960, 275 did by 1994 (Powell & Grunwald, 2005). Arguably, likely other factors are at play, such as in increase in the U.S. population at large, but it would appear on its face that the NFIP did not constrict the development of flood hazard areas to the degree that the founders likely envisioned.

The impact of rate subsidies not only contributes to people living where they might not live if they had to bear the financial cost of doing so, it also impacts the financial viability of the NFIP. The NFIP is currently \$17.5 in debt and likely unable to repay the debt to the federal treasury especially if costly flood-based events occur in the near future (Fugate, 2011). In testimony before Congress in March 2011, FEMA Administrator Fugate reported that while the NFIP collects nearly \$3B in revenue annually from premium receipts, the fund foregoes approximately \$1.5B in premium revenue due to subsidization of policies (Fugate, 2011).

## **2. Key Weakness: Enforcement of Floodplain Management Practices**

The NFIP imposes building code, elevation, and land-use requirements on communities as part of being enrolled in the NFIP. These provisions are designed to promote sound land use and to mitigate against future flood risks. These provisions are administered at the local—community, county, or city—level typically by local floodplain administrators. FEMA has an oversight role in ensuring that participating communities enforce the requisite floodplain management requirements stipulated by the NFIP. FEMA accomplishes this enforcement by visiting communities to conduct periodic inspections known as Community Assistance Visits (CAVs). Sometimes states conduct these inspections on behalf of FEMA. Provisions of the NFIP provide for sanctions against a community that fails to enforce the floodplain management principles of the program adequately. These sanctions range from imposing a \$50 surcharge on individual NFIP policyholder premiums to expulsion from the program.

Evidence exists that FEMA—or predecessor agencies with oversight of the NFIP—does not engage as much as it could in this oversight role. As early as 1973, the GAO reported that the agency administering the NFIP had no system in place to determine if jurisdictions were keeping their end of the quid pro quid arrangement by enforcing floodplain management practices they pledged to adopt in exchange for offering their citizens flood insurance (General Accounting Office, 1973). A 1975 Comptroller General report argues that the NFIP oversight agency “does not formally monitor the flood insurance program to insure that communities enforce approved flood

plain management regulations” (p. iii). In 1998, the Federal Wildlife Federation, in its report on buyout of flood damaged properties, similarly reported that enforcement of the NFIP’s requirement to rebuild substantially damaged properties (from flooding or any other event) to higher flood-proofed standards was not being enforced (Conrad, McNitt, & Stout, 2000).

Despite the criticism that FEMA does not aggressively oversee local floodplain management enforcement, evidence does exist that FEMA has the mechanisms in place to oversee local enforcement. One measure of its involvement is the 2011 National Flood Insurance Program Guidance for Conducting Community Assistance Contacts and Community Assistance Visits (FEMA, Federal Insurance and Mitigation Administration, 2011). Updating the 1989 version, the publication outlines the agency’s policies and procedures related to its oversight of local and community enforcement of floodplain management principles.

Even where FEMA has exercised its enforcement role, however, the courts have limited FEMA’s ability to penalize communities that fail to comply with the NFIP provisions. In *United States v. Parish of St. Bernard*, FEMA sued parish officials for reimbursement of recurring NFIP claims paid out because of the parish’s failure to enforce floodplain ordinances stipulated under the NFIP. The Fifth Circuit ruled that FEMA did not have a cause of action against the Parish (Berke & Campanella, 2006). This ruling effectively severely limits FEMA’s oversight role in that it has limited recourse against communities that do not enforce the program as Griffith (1994, p. 742) argues that “ it [NFIP] lacks any firm stick to ensure proper implementation of the program by local authorities.” As explored later in this chapter, adding to this predicament is a pro federalism sentiment within the United States, where states (and thus local) land use rights are separate from and superior to that of the federal government. To illustrate the degree that this oversight ability is being exercised, for the period 1986 to present, only 11 communities (currently 21,000 communities are enrolled in the NFIP) have been suspended from the NFIP for failure to enforce NFIP-required floodplain management requirements (FEMA, 2011a). Arguably, this lack of enforcement might be considered prima facie evidence that FEMA oversight of the compliance aspect of the

NFIP is less than robust, which leaves it up to state and local officials to enforce floodplain management principles, and as outlined in the next paragraph, this situation is not always ideal either.

Why is this FEMA oversight important? It is important because this oversight is the often the only enforcement factor independent of community enforcement, and ample reason exists to believe that participating communities may not be adequately enforcing NFIP floodplain management provisions. Lehrer (2008, p. 8) outlines report findings dating back to the Ford Administration indicating “a lack of action to enact State or local land use ordinances that would minimize the effects of flooding.” More recently, in the wake of Hurricane Katrina, the Department to Homeland Security Office of the Inspector General conducted a review into whether local floodplain administrator practices were being systematically abused. The results indicate substantial inadequacies exist in enforcing key NFIP provisions (DHS OIG, 2006).

The reason for the lack of enforcement at the community level is political and economic pressure. It is ultimately the local floodplain administrator—who in smaller jurisdictions frequently holds other jobs—to enforce floodplain ordinances required if communities wish to afford citizens of NFIP policies. Cigler, Stiffler, and Burby (1987, p. 114) illustrate the difficulties facing smaller jurisdictions: “The mandates of the NFIP are particularly demanding for small, rural governments which often lack the personnel and other resources necessary...” to implement provisions of the NFIP, e.g., establishment of flood management plans. Most city and county civil servants ultimately answer to a political boss who must answer to his or her constituents, and as Miletti (1999, p. 160) points out, a politician’s view of managing floodplain development might be framed by tenure, “while the benefits are uncertain, [they] may not occur during the tenure of current elected officials, and are not visible (like roads or a new library). Moreover, not all constituents want to be told they must elevate their homes after a flooding event, nor can they necessarily afford to do so; not all constituents want development and home values stunted by floodplain designations; not all constituents want to forego the economic benefits of development occurring in flood hazard areas; and lastly, not all jurisdictions want to forego the tax revenues that floodplain development might provide.

Former Secretary of DHS, Michael Chertoff (2008) refers to this attitude as the “not in my backyard” parochial syndrome; while good floodplain administration is cognitively recognized, the need to do so becomes blurred when local residents and economies are affected in their backyard. Marshall Frech, former head of the Flood Safety Education Project with the Corps of Engineers and producer of the documentary Texas Flood, opines:

One of the most pervasive problems in floodplain management is that so many layers of business have profited substantially from developing (and later redeveloping) housing in floodplains...Local entities have also profited greatly from the increased taxation on this whole chain of events. (Holtcamp, 2006, n.p.)

The realization of the problem is indicated by the New York State Floodplain and Stormwater Managers Association’s (2010) observation on the potential for lack of enforcement and the impact of political influence at the local level. The Association recommended that an independent party [non-federal] outside the local community should review proposed floodplain developments. Burby (1998) writes extensively of the reluctance and practicality of local officials enforcing politically and economically unpopular land-use requirements, such as those witnessed under the NFIP.

While this author was unable to locate evidence of formal studies documenting the lack of local enforcement of the NFIP, history is replete with communities that failed to heed the lessons of history. What happened after the 1993 Midwest Floods is illustrative:

Chesterfield Commons, the largest strip mall in the country, would have been underwater. 1 In the summer of 1993, the rain began, and did not stop until it flooded 17,000 square miles of the Midwest, damaged 70,000 buildings, killed fifty people, and caused damages exceeding \$12 billion. 2 Over a decade later, much of this land is home to new development, with tens of thousands of acres more planned. 3 In the St. Louis region, more than \$2.2 billion worth of new commercial and residential development currently stands on land that was under water in 1993. (Davidson, 2005, p. 1)

Nearly seven years after Tropical Storm Allison devastated Houston, the following was observed in 2007:

The flood consumed entire neighborhoods. Today, nearly seven years later, one might expect to see open floodplains and wide drainage areas replacing the flooded homes to prevent similar catastrophes. Rather, entirely new neighborhoods of beautiful townhouses replace the destroyed bungalows and sit in the path of future floods. (McMillan, 2007, p. 1)

### **3. Key Weakness: No Ceiling on Losses**

In the private insurance industry, it is a well-established practice to deny insurance to high-risk applicants. The designation of high risk for property insurance is often invoked when a homeowner files claims too frequently (Smart Money). The designation can carry with it higher premiums or denial of insurance coverage. It is this prospect that may cause homeowners to take action to mitigate future risks; for example, installing a security system after a home burglary that resulted in a claim. The net effect is likely that the prospect of either higher rates or being dropped from coverage spurs action on the part of policyholders, which is not the case with the NFIP, where no applicant is rejected and no limit exists on the frequency of claims. Under the NFIP, a policyholder is not penalized for not acting to mitigate flood risk, e.g., to elevate or flood proof. Structures that suffer repeated flood-related losses are allowed to receive reimbursement for losses without a cap on the number of claims. In some cases, the sum of these repeat reimbursements exceeds the value of the home (Lehrer, 2008).

The scope of the repetitive loss issue is large, both in terms of number of properties and financial impact to the NFIP. The Department of Homeland Security Inspector General, in a 2009 audit, reported that “The number of insured properties annually incurring second and third flood losses has increased by 68% and 57%, respectively, over the past 20 years” (p. 1). The General Accounting Office (Government Accountability Office, 2010b) advises that repetitive loss properties account for up to 30% of the claims paid by the NFIP. Critics argue that limiting repetitive loss payouts would induce homeowners to take active steps to mitigate against future losses (Burby, 2006).



## **E. AREAS WHERE THE NFIP IS WORKING**

Thus far, the reader has been exposed to predominantly negative angles about the NFIP and to what at times appears to be overwhelming criticality of the program. The program does have its supporters, and evidence indicates aspects of the program are indeed effective in reducing the impact and costs of flooding. Two of the most acclaimed aspects of the program follow: 1) The Community Rating System and 2) Identifying Flood Risk.

### **1. Community Rating System**

A popular program in the NFIP is the Community Rating System (CRS). In exchange for taking additional efforts to mitigate against the risks of flooding, communities participating in the NFIP are able to reduce the NFIP premiums their constituents pay by as much as 45 percent. The program seeks to encourage communities to take actions above the minimum required NFIP requirements. FEMA (2011b) defines the goals of the CRS as follows.

1. “Reduce flood losses
2. Facilitate accurate insurance rating
3. Promote the awareness of flood insurance”

The program identifies mitigation measures a community may undertake to qualify for discounts under the program. Each measure is assigned a value and premium reductions are awarded in increments of 5 percent. Measures netting a community a premium rate reduction range fall under four broad categories (FEMA, 2011b).

1. Public Information
2. Mapping and Regulations
3. Flood Damage Reduction
4. Flood Preparedness

Examples of activities a community might take to warrant a discount include measures, such as undertaking a proactive outreach effort to inform citizens of indigenous flood risks, measures to reduce that risk; and the availability of flood insurance (FEMA, 2006a). Other activities a community might consider include requiring

new construction to be built above the minimum required base flood elevation level; undertaking programs that reduce flooding caused by blocked or debris-filled waterways; and programs designed to promote coastal erosion protection maintenance (FEMA, 2006b).

Evidence exists that the program is inducing communities to undertake flood-based mitigation measures voluntarily. Zahran, Brody, Highfield, and Vedlitz, (2010) published the results of a longitudinal study of 214 Florida communities that participate in the CRS. The key finding of the study is that the CRS works to compel more mitigation efforts on the part of a community:

Even when controlling for multiple biophysical and socioeconomic variables depicting the local conditions of a jurisdiction, the distance to the next CRS discount interval and the prospect of reaching the next class rating motivates participating communities to take actions that reduce the adverse impacts of floods. (Zahran et al., 2010, p. 234)

This same study found that for the communities studied, each 5% increment change in the CRS—equating to a one unit increase in the CRS rating—reduces, on average, flood damage by \$303, 525 (Brody et al., 2007). The authors further report that their study reveals that “one unit increase in the CRS rating buys a locality a buffer against approximately two additional inches of rain” (p. 342).

As over 1,000 communities representing 67% of the NFIP policy base currently participate in the CRS (Freitag, Bolton, Westerlund, & Clark, 2009), the extrapolated results of the Florida study indicate that the CRS is effective in engaging communities to take steps aimed at reducing flood risk.

## **2. Identifying Flood Risk**

Knowing and understanding one’s flood risk may arguably be considered the first step to attempting to mitigate or eliminate that risk. In the words of FEMA flood risk spokesman, Josh deBerge, “When home and business-owners know and understand their risk, they are more likely to take steps to reduce their risk” (Associated Press, 2010).

As the reader will recall, the founders of the NFIP called for the identification and publication of the nation's floodplain areas. The NFIP's means for doing this is through the publication, by the sponsoring Agency FEMA, of flood insurance rate maps that depict flood risk. These maps are important not only because they designate flood risk, but because they can trigger certain provisions of the NFIP, namely, the requirement of holders of federally-backed mortgages to purchase flood insurance if they live in a designated floodplain. A property owner's location on a flood risk map also determines the rate of insurance that property owner will pay. Flood maps are also used to guide development and local land-use planning, which are utilized by emergency management officials for response and recovery efforts, and for natural resource management purposes (King, 2011).

Critics have railed against FEMA for what it views as inaccurate and old maps. A GAO report (2004) reports that as of 2004, "70 percent of the nation's flood maps were more than 10 years old and reflected outdated data that could affect the ability to accurately identify current flood hazard areas" (p. 2). The GAO report followed on the heels of a Congressional initiative in 2003 designed to update and digitize the nation's flood risk maps. Operated under the auspices of FEMA, the five-year initiative, which has been subsequently extended, is known as the Map Modernization Project. The goal of the project is to conduct a nationwide flood insurance study resulting in more accurate maps, and by being digitized, more readily available to more people.

The Map Modernization Initiative has been successful in modernizing the nation's flood maps inventory. By April 2008, 58 percent of the nation's maps were more than 10 years old as opposed to 70% just four years earlier (Government Accountability Office, 2008c). In testimony to Congress in 2010, FEMA Administrator Craig Fugate reported that the number of modernized maps had increased significantly and that by the end of fiscal year 2009:

FEMA had issued modernized flood insurance rate maps in preliminary format for over 80 percent of the nation's population in approximately 13,000 communities, and approximately three quarters have now been finalized (covering more than 60 percent of the nation's population in about 7,700 communities). (Fugate, 2010, p. 4)

As of March 2011, FEMA Administrator Fugate reported to Congress that 88% of the nation's maps had been updated (Fugate, 2011). More recently, FEMA and the NFIP have begun building upon the Map Modernization Initiative and transitioning it into a revised program known as the Risk Map Initiative. FEMA reports that the vision of Risk Map is to "to deliver quality [flood risk] data that increases public awareness and leads to mitigation actions that reduce risk to life and property" (FEMA, 2010a, p. i). What makes Risk Map different from the Map Modernization Initiative is that in addition to seeking to update the nation's flood map inventory, the approach of Risk Map is to engage citizens and local officials more fully throughout the risk identification process that culminates in a finished flood map. This approach is important because a frequent complaint about FEMA's flood map process is that citizens are not aware of impending maps affecting their communities until after the maps are finalized. The reader will recall that issuance and finalization of a flood map has certain triggers. It can, for example, require homeowners who are now but were not designated as residing in a flood zone before the new maps to purchase flood insurance if they hold federally backed mortgages. Depending on the degree of flood risk, this requirement can be a financial shock to a homeowner. Internet blogs and newspaper articles are abundant about citizen concerns alleging they were not duly notified of or engaged in the production of new maps that affect them financially, and from a community standpoint, have the capacity to alter future development. The Douglas County Nevada story is a typical reaction of citizens who feel they have been left out of the process. In 2009, Douglas County citizens and officials sought relief from impending flood maps by having their Congressional representatives send a letter to FEMA Administrator asking FEMA to "abandon the proposed maps and start over "with improved communication and coordination with Douglas County and other stakeholders" (Gardner, 2009, n.p.).

While the NFIP has strong elements, core structural aspects of the program exist that render it less than effective in achieving its stated goals of reducing disaster costs and steering development from flood-hazard areas. The next section examines the likelihood of reforming the NFIP to achieve its stated goals.

## **F. WHY IT IS LIKELY THE NFIP CANNOT BE FIXED**

Political, economic, and societal influences preclude the likelihood of substantially changing the NFIP. The reader need only refer back to the history section of this chapter to realize the many times that meaningful changes to the NFIP were recommended or offered only to be turned down or reversed for either political or economic reasons.

On a political level, it is likely difficult for a politician to face constituents and agree that the purchase of flood insurance is required because of new flood insurance rate maps issued by FEMA. Instead it may be more politically correct to attack the high NFIP rates or to attack the accuracy of the flood maps. Most recently, the political tact has been to attack the requirement for flood insurance for developed areas behind levees. In February 2011, .S. Senators Thad Cochran (R-Miss.), Roger Wicker (R-Miss), Dick Durbin (D-Ill.) and Mark Pryor (D-Ark.) introduced a letter (known as the Cochran 27 letter) signed by a total of 27 senators to FEMA Administrator Craig Fugate asking to effectively cease the mapping of the risk associated with levees not accredited to a specified level of safety. As background for the reader, in the wake of the levee breeches associated with New Orleans during Hurricane Katrina, closer scrutiny has been paid to the degree of safety of levees nationwide. One of these measures involves producing flood insurance risk maps that document the level of risk of flooding behind the nation's levees. Creating these maps has implications for development, insurance costs, and the need to buy flood insurance for all those who live landward of a levee not deemed accredited to a prescribed level of safety. The outcry—as evidenced by the Cochran 27 letter—has been loud, constant, and pervasive by citizens and politicians alike.

The political pushback is a function of economics. On an individual level, it is not always affordable for citizens to pay NFIP premiums. The perception also exists that someone's home being designated as being in a flood zone will reduce the property's value. On a community level, the perception exists that the designation of a property or tract of land as being in a flood zone reduces the development prospects for that land.

Local newspaper stories and blogs are full of the perceptions of those who face flood zone designations and insurance requirements. Reports one jurisdiction in Ohio that recently received new flood insurance maps:

Hundreds of Cuyahoga County residents will face increased home insurance premiums, lower property values and reduced chances of selling their homes because of revised flood maps. It's like living in a toxic waste dump, said Duncan Cooper, a resident of Willow Wood Drive, off Boston Road in Strongsville. If you're looking to buy a home, are you going to buy one that's listed in a flood zone? Of course not. (Caniglia, 2011, p. 1)

The town of Itawamba, Mississippi is similarly concerned. New flood risk determinations by FEMA designate as being within a flood zone a property tract that an ethanol plant is considering for development: Officials in Itawamba and Monroe counties say the flood zone designation would hurt economic development plans for industrial sites (Associated Press, 2011).

The truth of the matter is that some of these stories can tug at an individual's heart. The designation of flood risk for a property owners or an area can affect peoples' pocket books and likely does affect development. It can be tough to impose this requirement on citizens, regardless of their economic situation. It is precisely for these reasons that politicians have a difficult time supporting the law their predecessors imposed, the National Flood Insurance Program. It is precisely for these reasons that the NFIP cannot be effectively changed to reflect actual versus subsidized rates, to realistically expect local communities to restrict land use, or to require local communities to rigorously enforce floodplain management ordinances.

Lastly, the difficulty in meaningfully changing the NFIP toward an end of reducing the impact and costs of flooding events is a function of the expectations of U.S. society. Two factors are at play, individual property rights and the role of the federal government in providing disaster assistance.

With respect to individual property rights, Platt (2000) and others (Hoover, 2005) speak to a property rights movement in this country centering on the 5th Amendment's clause that no "private property be taken for public use, without just compensation." This movement has been characterized as follows:

This coalition is comprised of individuals and groups who often have conflicting purposes, philosophies and interests but who unite behind one unifying thought, an almost Jeffersonian belief in the sanctity of an individual's "civil right" to do as they like with their land. These folks basically hate government land use regulation. (Thomas, 2007, p. 1)

With regards to the NFIP, this clause has translated into what is known as the "takings" issue. The term "taking" in this context generally equates to an action by a government agency, such as the NFIP, that relieves people of their property without payment (FEMA, 2006c). This notion has been interpreted in the courts to include not just taking of someone's land but regulatory impositions on that land that have detrimental economic impact to the property owner (Platt, 2000). Several cases have tested the NFIP's regulatory impact on property rights. In *Lucas v. South Carolina Coastal Council* 112 S. Ct. 2886, 1992, the courts held that the denial of a building permit in a flood-hazard area fit the "takings" clause. Other cases have led to changes in floodplain management of local ordinances because of lawsuits, for example, the *First English Evangelical Lutheran Church of Glendale v. County of Los Angeles*, in which the county sought to limit development in floodplains. The county later removed that section of the ordinance (Singer, 1990). The NFIP has generally been upheld in its exercise of authority over floodplain management practices (Singer, 1990), but court cases, such as these are likely to have caused local floodplain administrator and community officials to think twice about imposing NFIP land use elements (Platt, 2000).

The specifics of the "takings" issue reflects a broader societal sentiment—the sense that government should have limited ability to regulate land use. Simply stated, property owners' do not wish to see regulations, such as the NFIP mandate use of their land.

The second societal factor reducing the feasibility of substantial NFIP reforms revolves around the perceived role of government in providing disaster assistance. In other words, a perception exists that responsibility for disaster indemnification, to include flooding, rests with the federal government, which starts with the Stafford Act. Birkland and Waterman argue that “there is a widespread misconception among citizens, journalists, and some members of Congress is that the federal government, under the Stafford Act, is primarily responsible for disaster relief and recovery services” (Birkland & Waterman, 2008, p. 696). In a 2007 study conducted for the Department of Homeland Security, the authors concluded that the certainty of disasters assistance has created an environment “where people expect the government to pay for the replacement of their homes or properties” (Homeland Security Institute, 2007, p. 63). The Center for a Better Life similarly opines by arguing that this country has a challenge in that when flooding occurs, “the federal government tends to come in, provide some high level of economic support and do a great deal to take care of the people, whether or not they carry insurance” (Center for Better Life, n.d., p. 1).

This sentiment that the government is the insurer of first and last resort is part of a broader trend in which the role of the government has in fact increased in terms of disaster assistance. What is being witnessed is part of an overall historic trend of transferring the burden for disasters from individuals and communities to the federal government. As early as the 1980s, this trend was evident when Clary (1985) offered statistics that the federal share of disasters was 1% in the 1950s but had reached 70% by the mid-70s. Wildasin (2008), in making the case for the increasing role of government in disaster assistance and the shifting of costs, points to the costs associated with Hurricane Katrina and states, “Clearly, a very substantial portion of the costs of this disaster have been shifted to the national government and thus to the population residing outside of the disaster-stricken region” (Wildasin, 2008, p. 2).

## **G. CHAPTER SUMMARY**

Flooding matters. Flood events impose significant economic loss to individuals and communities and to the country at large. This loss was recognized in the 1950s and



1960s as the nation's leaders sought to develop public policy to reduce the impact of flooding on individuals, to reduce flood-related disasters costs, and to steer land use decisions away from flood-prone areas. The public policy created to achieve these goals is the National Flood Insurance Program.

The NFIP has not achieved its goals and critics argue that the concerns of the creators of the program have come to fruition:

Incorrectly applied, it could exacerbate the whole problem of flood losses. For the federal government to subsidize low premium disaster insurance or provide insurance in which premiums are not proportionate to risk would be to invite economic waste of great magnitude. (U.S. Congress, 1966b, p. 16)

As currently and historically implemented, the NFIP significantly influences the impact and costs of flooding by its inability to influence land use decisions away from flood-prone areas by encouraging development and living in flood-prone areas by way of subsidized insurance rates coupled with the reality that at the local community level, weak enforcement of floodplain principles exists. As demonstrated, development of flood-prone areas in this country has dramatically increased since the inception of the NFIP. In 1960, 180 people lived per square mile in the coastal United States; by 1994, 275 lived per square mile (Powell & Grunewald, 2005, p. 2). It has been estimated that “three-quarters of all the U.S. population soon will live within fifty miles of a tidal or Great Lakes shoreline” (McMillan, 2007, p. 7).

No evidence exists that the NFIP has been able, as its founders intended, to reduce flood-related disasters costs. On the contrary, Brody et al.d (2007), citing statistics from the Spatial Hazard Events and Losses Database for the United States (SHELDUS), report that in the 1960s, floods caused more than \$41.69 dollars in damage per year, and that by the 1990s, this number had increased to \$378.12 million per year (in 1960 dollars). Pielke and Downton (2000) report similarly, citing statistics from the National Center for Atmospheric Research, that the inflation-adjusted flood losses have increased five-fold from the 1940s to the 1990s. Moreover, the NFIP is currently \$17.5 billion in debt

(Fugate, 2011) with no foreseeable way to address the debt other than transferring the costs to the public at large. These dire statistics aside, materially fixing the NFIP is not realistic given the economic, political, and societal influences explored in this chapter.

The next chapter considers yet another major nation policy, the Robert T. Stafford Act, and how, not unlike the NFIP, it influences the impact and costs of flooding.

THIS PAGE INTENTIONALLY LEFT BLANK

### **III. THE STAFFORD ACT AND HOW IT INFLUENCES THE IMPACT AND COSTS OF FLOODING**

What you cannot mitigate, you must prepare for; what you haven't prepared for, you must respond to; and ultimately, what you have not responded to, you must recover from.

— (Freitag, Bolton, Westerlund, & Clark, 2009, p. 117)

#### **A. INTRODUCTION**

The Stafford Act is the second of two public policies discussed in this thesis that influences the impact and costs of flooding. While the previous chapter focused on the NFIP and how it largely addresses flooding risk in anticipation of a flooding event, this chapter focuses more on how risk is addressed—by way of the Stafford Act—*after* a flooding event and with a view toward mitigating future events.

As with the NFIP, aspects of the Stafford Act are suboptimal in addressing and reducing the impact and costs of flooding. Unlike the NFIP, however, this author maintains that more feasibility appears to exist in addressing these shortfalls both politically and economically.

This chapter includes a history of disaster assistance, which culminates in the Stafford Act and its reforms since its inception in 1988. Following this, the reader is informed on how the Stafford Act influences the impact and costs of flooding. The chapter then reviews in depth key provisions of the Act suboptimal in effect, and if improved, could serve to reduce the impact and costs of flooding.

#### **B. OVERVIEW OF THE STAFFORD ACT**

The Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 et seq is the nation's principal legislation for how the federal government responds to disasters within the United States (Moss & Shelhamer, 2007). The Federal Emergency Management Agency (FEMA) is the federal agency with primary responsibility for administering the provisions of the Act (Moss, Shelhamer, & Berman, 2009). The Act

defines how events or emergencies are declared eligible for assistance, which type of events are covered by the Act, and the types of assistance available to citizens, state and local governments, households, tribal entities, and certain nonprofit organizations after a disaster. The range of assistance—both direct and financial—includes three broad categories of 1) individual and household assistance to include temporary housing and funding for repairs, cash grants for uninsured personal needs, as well as unemployment and legal assistance and crisis counseling, 2) Public assistance, to include debris removal, emergency protective measures, repair, reconstruction, or replacement of infrastructure, public buildings, and critical and recreational facilities, and 3) Hazard mitigation assistance, which provides for grants “to significantly reduce or permanently eliminate future risk to lives and property from natural hazards” (FEMA, 2007, p. 1)

The source of funding for the Stafford Act is the Disaster Relief Fund, which is appropriated by Congress annually and on an as-needed basis. The impact of the Stafford Act is significant in terms of dollars drawn from the U.S. Treasury and aid dispensed to state and local entities. The United States has averaged 71.4 declared disasters and emergencies per annum over the period 1998—2010 (FEMA, 2011h), and from 1989 through 2010, Congress has appropriated \$292 billion in disaster assistance for an annual mean outlay of \$13.3 billion (Lindsay & Murray, 2011).

### **C. UNDERSTANDING THE ACT BY REVIEWING ITS HISTORY**

Reviewing the history of the Stafford Act is illustrative in that it underscores the increasing role of the federal government in the disasters assistance arena. This understanding will prove useful as the reader progresses to the policy options portion of this thesis.

As recently as 1950, no formal federal disaster assistance program was in place in this country. The role of the federal government in disaster assistance was limited as calamities—to include flooding events—were considered an act of nature, and thus, not considered within the purview of the federal government (Clary, 1985). Instead, individuals assumed responsibility for their own fate, and when fate landed them a heavy blow, charitable organizations, such as the American Red Cross, were considered the

appropriate resource for assistance. When the federal government did step in, it was on an event-by-event basis and usually with in-kind payments, e.g., direct aid via medical personnel, supplies, and equipment (Hoover, 2005). The federal government was not considered the primary provider of relief that it is now. To contrast the change in philosophy, consider these remarks by a former President when vetoing disaster relief legislation. In 1877, President Grover Cleveland opined, “Federal aid encourages the expectation of paternal care on the Government and weakens the sturdiness of our national character....” (Freidel, 1999, p. 51).

Over time, this ad hoc and incremental approach was deemed inefficient and paralleling a societal shift in the role of the federal government. In 1950, Congress passed the Disaster Relief Act of 1950 (Federal Disaster Relief Act, 1950), which implemented “the first comprehensive, nationwide system of disaster response and relief” (Clary, 1985, p. 20). Several firsts occurred with this legislation: 1) for the first time, it was articulated that federal-level support is appropriate in times of disaster and, and 2) special legislation was not necessary for the federal government to provide disaster aid—merely a Presidential decision. While comprehensive, the intent of the Act was to supplement state and local resources to *respond* to a disaster and the scope of the efforts was generally toward repair and replacement of government facilities and public infrastructure. In 1966, Congress passed the Disaster Relief Act of 1966 to “expand Federal assistance into the *Recovery* arena” (Baca, 2008, p. 2). After the nation witnessed the devastating effects of Hurricane Camille in 1969, as well as a series of devastating tornadoes in the 1970s, in 1969 and 1974, Congress passed additional relief acts; the scope of this legislation expanded federal efforts from government to government support to government to individuals, local communities, and the private sector support. The 1974 Disaster Relief Act in particular was landmark in that it articulated mitigation measures instead of solely focusing on responding to and recovering from disaster (Sylves, Cumming, & William 2004). The disaster landscape was clearly changing and the role of the federal government was expanding, as evidenced by the increase in the federal government’s share of disaster relief: rising from 1% in 1950 to 70% by the mid-70s (Clary, 1985).

In 1979, President Carter issued Executive Order (EO) 12127 and 12148, establishing the Federal Emergency Management Agency (FEMA). The Executive Orders were a result of officials and legislators complaining that too many different federal offices and agencies existed—up to 100 at one point—involved in disaster efforts, often working as cross purposes and certainly not in a unified manner. Executive Orders 12127 and 12148 were intended to bring these agencies together under the umbrella of one agency and calling for the “consolidated authority for both manmade and natural disaster preparation, mitigation, response, and recovery within a single federal agency” (Baca, 2008, p. 3), which sets the stage for the centerpiece of this chapter, the Stafford Act.

The Stafford Act was promulgated in 1988 as a permanent mechanism to provide not only disaster assistance, but also a coordinated federal response to disasters, which marked the end of a national history of limited ad hoc federal disaster relief and limited role of the federal government in disaster assistance. For the purpose of this thesis, the centerpiece of the Act was the establishment of the 75% federal/25% state framework for indirect assistance, establishing the provision of public assistance for repair and restoration, emergency work, and debris removal, and emphasized mitigation, and the establishment of mitigation grants (Moss et al., 2009).

In the 1990s, the country witnessed more Congressional interest in the rising cost of disasters (Moss & Shelhamer, 2007), and in 1998, the General Accounting Office (GAO) issued a report addressing how to reduce these costs. One of the recommendations called for an increased emphasis on mitigation efforts. The Stafford Act was amended in 2000 by the Disaster Mitigation and Cost Recovery Act (Disaster Mitigation Act of 2000, 2000), which required, as a prerequisite for receiving many forms of aid under the Stafford Act, the existence of hazard mitigation plans at the state and community level. The Disaster Mitigation and Cost Recovery Act (DMA) strengthened existing planning requirements by compelling communities to develop a plan of action to mitigate against natural hazards.

After Hurricane Katrina and the perception of the federal government’s poor response to the event, there were public and political outcries to reform the Stafford Act.

In 2006, the Post Katrina Emergency Management Reform Act (PKEMRA) was legislated, which made sweeping changes to FEMA's organizational structure, authorized manpower levels, and relative position within DHS (Government Accountability Office, 2008a). All these factors were considered barriers to FEMA's ability to respond adequately to Katrina-related events. PKEMRA also expanded the Stafford Act's Public Assistance program by categorizing educational institutions as being a critical service, thus making nonprofit schools eligible for Public Assistance. PKEMRA also made provisions for the care of pets and persons with disabilities during a disaster. As well, PKEMRA provided for a pilot Public Assistance Project with an aim toward accelerating the length of time it takes to complete infrastructure and building repairs and replacements. Most importantly, for the purpose of this thesis, PKEMRA doubled the amount of funding available for hazard mitigation grant funding for disasters with an estimated cost of less than \$2 billion.<sup>2</sup>

Since the aftermath of Katrina-era reforms, several active movements both internal and external remain to the Stafford's Act governing agency, FEMA, to reform the Stafford Act.

External to FEMA, in 2010, The United States Conference of Mayors stood up the Stafford Act Reform Task Force—largely in response to the perceived shortfalls of provisions of the Act during the response and recovery phase of Hurricanes Katrina and Rita. The Task Force issued the *Report of the Stafford Act Reform Task Force* calling for changes to many aspects of the Act (The United States Conference of Mayors, 2010). For section 404 of the Act, the Hazard Mitigation Grant Program (HMGP), the Task Force called for major reforms to include increasing the amount of mitigation grant funding available after a disaster, changing the mitigation grant non-federal match, and for providing incentives for exceeding building code enforcement.

Internal to FEMA, efforts have been underway to simplify and change key aspects of the Stafford Act. Complaints from constituents and lawmakers about their perceptions of the Act's inability to respond quickly after a disaster to begin rebuilding and mitigation

---

<sup>2</sup> Certain limitations exist based on the total estimated cost of the disaster.



efforts spurred the agency to action. In 2008, FEMA asked the National Advisory Council to recommend changes to simplify select aspects of Stafford Act (Bennett, 2009). In 2009, the council recommended several measures designed to accelerate and simplify post-disaster recovery efforts and to expand federal grant and assistance cost share levels. Commenting on the council's charter, the Association of State Floodplain Administrators (ASFPM) recommended several mitigation actions that if enforced, would reduce the costs and impact of flooding events, e.g., limiting Public Assistance funding to communities that do not mitigate for future flood events: "All taxpayer-funded flood disaster relief should be contingent upon taking flood mitigation action where feasible—whether public or private" (ASFPM, 2011, para 6). The ASFPM has also called for increasing the federal cost share of flood-control control projects, nonstructural flood measures, mitigation, and flood disaster assistance for communities that "engage in disaster-resistant activities exceeding minimum criteria, are implementing aggressive mitigation programs, or that elect nonstructural projects to mitigate flood risk" (2011, para 11).

#### **D. HOW THE STAFFORD ACT INFLUENCES THE IMPACT AND COSTS OF FLOODING**

The Act plays a key role in influencing the cost and impacts of flooding—the nation's most frequent disaster by providing incentives to communities and individuals to undertake mitigation measures; by limiting and enforcing federal disaster assistance when certain mitigation and NFIP measures are absent, and by mandating and enforcing specifics on post-disaster structural reconstruction and repairs. The efficacy of the Act's mitigation programs, the degree to which financial assistance is withheld or provided, and the manner in which reconstruction and repairs are made, can parallel the increase or decrease in the impact and costs of future flooding events. If mitigation programs, for example, elevating structures are successful, then the impact and costs of future flooding events will be reduced. If the likelihood of decreased disaster assistance spurs communities to undertake mitigation activities, then the impact and costs of future events will likely be reduced. If post-disaster reconstruction efforts incorporate mitigation activities, then it can be anticipated that future events will result in less flood damage.

As this section demonstrates, provisions of the Stafford Act adversely influence the impact and costs of subsequent flooding events because a key provision of the Act is not being enforced and because incentive provisions are less than optimal. Future chapters propose that changing these provisions would influence a reduction in the impacts and costs of flooding.

### **1. The Three-Strike Rule**

The Stafford Act as currently enacted allows for the continual federal taxpayer funding of damaged properties (declared by a federal disaster) without the need for the property owner to undertake mitigation efforts. No cap exists on the number of claims for assistance for an individual structure or property. All other factors being equal, it could be argued that this influences the impact and costs of flooding. This situation exists because a key provision of the Stafford Act is not being enforced. Section 406 of the Stafford Act mandates a reduction in the federal share from 75% to not less than 25% for public assistance—the repair, restoration, and replacement of public and private nonprofit facilities—if the following conditions are met: 1) The structure was damaged on more than one occasion within the preceding 10-year period by a similar event, and 2) The owner of the property has not taken appropriate measures to mitigate against flooding hazards. Referred to as the ‘three-strike rule,’ this provision was added to the Stafford Act by Section 205 of the Disaster Mitigation Act of 2000. The provision takes effect after FEMA has issued implementing regulatory guidance. In 2007, 2008, and 2009, FEMA issued a proposed rule to this effect in the Federal Register but as of this date, the final rule has not been published, despite it being over 10 years since the requirement was made law (Federal Register, 2009). The impact of not implementing the rule is potentially extensive. Public buildings and infrastructure are allowed to suffer repeat damages with no requirement for the community or property owner to take steps to reduce future losses, which creates a moral hazard not unlike the NFIP in that the promise of future federal aid lowers the incentive to take steps to address the inherent risk (Mileti, 1999).

## 2. Hazard Mitigation Grant Program Provisions

A key role that the Stafford Act plays in reducing future flooding costs is through its Hazard Mitigation Grant (HMG) Program, which provides a variety of financial incentives to encourage communities and individuals to take steps to reduce future losses from flooding events. However, key provisions of the HMGP—and applications of aspects of these provisions—potentially render the program less than optimal in reducing flooding impacts and costs. To better understand the implications of these provisions, an overview of the Hazard Mitigation Grant Program (HMGP) is offered.

The HMGP is the primary venue by which communities and individuals can take actions *after* a disaster to mitigate and lessen the impact of future damage. After a flooding event, timing is everything: it is when the attention and focus of citizens and community officials is heightened with regards to the threat of flooding, which creates a momentary “window of opportunity” (Godschalk, Brody, & Burby, 2003). FEMA manages the program, which defines mitigation as “sustained action taken to reduce or eliminate long-term risk to people and their property from hazards and their effects” (FEMAc, 2011).

Mitigation works. A Congressionally mandated study conducted in 2005 by the Multi-Hazard Mitigation Council of the National Institute of Building Sciences National revealed that for every dollar spent on mitigation activities, \$4 is avoided in future losses (National Institute of Building Sciences, 2010). For flood losses in particular, the avoided losses are \$5 for every dollar spent (Department of Homeland Security Office of the Inspector General, 2009). HMGP mitigation efforts related to flooding include drainage improvements; elevation of structures; flood proofing structures; and acquisition, relocation, or demolition of flood-prone properties. The Stafford Act’s Disaster Relief Fund funds the program. After a federally declared disaster, Section 404 of the Stafford Act authorizes up to 15% of the estimated amount spent on certain response and recovery costs for that disaster to be spent on natural hazard mitigation activities, subject to certain ceiling caps. As a condition of receiving these funds, communities must conduct and have in place natural hazard mitigation plan. The program is managed with the state as

the grantee, and with the state channeling funds based on the state's priorities. The HMGP is offered on a cost-share basis, with the Disaster Relief Fund funding up to 75% of the cost of mitigation activities and state and communities (or individuals or tribes) paying the remaining 25 percent, which can amount to a significant amount of funds for a jurisdiction or state. For Hurricane Katrina, for example, the federal share granted for natural hazard mitigation efforts was approximately \$1.7 billion and for Hurricane Ike (2008) the amount was \$406 million.

Thus far, the HMGP sounds like a win-win in terms of reducing the cost of future flooding events and for local communities that benefit from this federal grant program. Several conditions serve to reduce the effectiveness of the program, however, in terms of reducing the impact and costs of flooding events.

*a. The Match Requirement*

As discussed earlier, the HMGP generally requires a 25% non-federal contributory match by the state or the local jurisdiction. The match can be in the form of cash or in-kind services. In recent years and within the framework of a troubled national economy—with state and municipalities similarly struggling with fiscal capabilities—the ability to meet this 25% match is increasingly difficult. The result is that not all available mitigation funding is realized and where realized, the mitigation activity occurring may be based on the availability of local match funding, not necessarily where the greatest need may exist. Consider the hypothetical example of a flooded impoverished community in Arkansas, and the flooding event is declared a disaster under the Stafford Act. The affected community wants to construct a new drainage system to prevent future flooding. The state will receive HMGP funds under Section 404 of the Stafford Act. Where the state directs those funds is a function of state priorities and political and economic considerations. No requirement exists for the state to channel the HMGP funds to the community (ies) affected from the disaster. Under the 75% match formula of the HMGP, either the community or the state must come up with the 25% in matching funds. In many cases, the 25% match is left up to the community affected to resource. Often, communities cannot resource these types of projects. Consider the likelihood that an

impoverished community, such as in the Arkansas example, will have the resources to come up with \$250,000 for a \$1M mitigation project. When it cannot, the state directs the HMGP funding to a community that can afford to pay the match. The community that can afford to pay the match, however, may not be the community with the greatest mitigation need and may not have been affected by the most recent disaster. This community may wish to purchase public warning systems using HMGP. Thus, in this example, the flooding in the impoverished Arkansas jurisdiction recurs because of the inability of the local community to meet match funding, and the state channels HMGP funding based on the community with the funding resources, not with the greatest need.

Regarding this affordability issue, NEMA has weighed in with its concerns about equitability in that it opines that the HMGP “has now become a competitive program which favors communities with greater ability to dedicate financial resources to grant applications, engineering, and preservation reviews before a grant application is even considered” (Little, 2006, para. 6). Congressional testimony is abundant about the financial hardships associated with meeting the 25% match requirement. In briefing Congress in 2010, the U.S. Council of Mayors (2010) recommended eliminating the 25% non-federal match altogether for catastrophic disasters. The council also recommended granting authority for the President to increase the federal share from 75% to 100% under certain circumstances. Notably, the council proposed directing HMGP funding to the community affected by the disaster in proportion to the damage, which may preclude or reduce the redirection of funds illustrated in the generator example.

Not just communities and states may steer away from flood mitigation because of the match requirement. As stated earlier, when the state does not make the 25% match for a HMGP, either the community (for community projects) or individuals (for individual mitigation or acquisition projects) must pay. The 25% match can serve as an economic disincentive for a household deciding whether to mitigate. In a 2004 FEMA-sponsored study examining the factors influencing flood victims to relocate, both local

officials and individual homeowners identified the 25% match requirement as a significant factor contributing to decisions to not relocate from a repetitive flood-prone property (Kick et al., 2011).

While as demonstrated previously, many officials and constituents clamor for reducing the non-federal match requirement, others question the need to reduce the funds required by the state, locals, and individuals. Wildasin (2008) argues that the match represents the level of participation by the recipient. This author questions if by reducing this level of financial participation, the level of commitment by the recipient may also reduce. Similarly, in 2000, the Association of Floodplain Managers (Wright, p. 80) argued, “state and local governments must have a fiscal stake in floodplain management. Without this stake, few incentives exist for them to be fully involved in floodplain management.” Thus, while on the face it may seem that non-federal share amounts for states, local communities, and individuals are being reduced, alternate views may exist that may warrant further research.

***b. Acquisition, Relocation or Demolition***

The HMGP can be used to fund the acquisition, relocation, or demolition of flood-damaged properties.<sup>3</sup> Under the 75%/25% cost share framework, flood-damaged properties under this acquisition umbrella providing the property has suffered more than 50% of the pre-market value of the home prior to the flooding event. Sometimes the state or jurisdiction pays the 25% match, and sometimes the residents are asked to pay. The property is then relocated to an area not designated as a flood-hazard area or the property is demolished in place. The program requires that the cleared land must then be restored to green space into perpetuity. Green space refers to situations, such as parks or wildlife refuges. Ideally, this space may be the most effective way to reduce the cost and impact of floods—through permanently removing properties from harm’s way. FEMA (2010c) reports that since 1993, over 20,000 properties have been bought out under this program and the associated land restored to green space. Critics argue that this number could be higher save for aspects of the program that inhibit its more widespread use. These aspects

---

<sup>3</sup> FEMA also funds acquisition of properties damaged by other hazards.

are aside from the difficult and complex decisions homeowners must make when deciding whether to relocate: sense of loss of community, proximity to employment and family, or financial considerations.

Inhibitors to the program include the fact that communities considering buying out properties under the HMGP face the dilemma of losing the property tax revenue loss associated with removing these properties from their jurisdiction. As the land the properties are located on must be restored to green space into perpetuity, unless a community comes up with an alternative means to compensate for this loss of tax revenue, the tax base of the community is effectively permanently reduced. Moreover, the decision on whether to engage in a buy-out program typically comes at a time when the community is already economically impacted—after a flooding disaster. ASFPM (2006) reports that an Ohio community that engaged in an HMGP acquisition project nearly defaulted on its wastewater treatment loan because of the degree to which the buyout program altered its property tax base and financial condition. In 2009, and in the aftermath of Hurricane Ike, Orange City Texas voted not to participate in a flood-damaged buyout program because of the loss of tax revenue (Toal, 2009).

Some community officials argue that the notion of buying out properties and relocating citizens to a non flood-prone area is not practical in a contained urban setting (U.S. Council of Mayors, 2010) and suggest that a more realistic alternative is to demolish a structure and then on the same site, rebuild it from the ground up to meet NFIP criteria and to a stronger, more flood-resistant level. Known as the demo-rebuild option, it is arguably less desirable from a mitigation standpoint than from returning the land entirely to green space. However, FEMA's own research indicates that structures built to NFIP criteria experience 80% less damage than those that are not (FEMA, 2010d). Rebuilding the structure also maintains the community tax base and generally increases it because of the increased value of the structure. Demo-rebuild also maintains the fabric of a neighborhood by not requiring citizens to relocate to varying other locales. Thus, on the face of it, the concept of demolition/rebuild would reduce the costs and impact of flooding events and would be a win-win for citizens and communities.

However, FEMA's HMGP does not currently allow for this except in limited cases and then only as a pilot project. Critics argue that broader application of this element of the Stafford Act would result in greater reduction in the costs and impact of flooding.

*c. Perceptions on How FEMA Has Interpreted and Administered the Stafford Act*

Critics argue that the Stafford Act provisions, to include the HMGP, are more complex and bureaucratic than necessary. The perceived bureaucracy of FEMA's implementation of Stafford Act provisions has been and continues to be the bane of many community officials, citizens, and grant and NFIP administrators. Officials argue that the Stafford Act was deliberately written to be broad and flexible, but FEMA's interpretation of the Act has been unnecessarily restrictive (Landrieu, 2010). Quipped Charleston Mayor Joseph Riley in recent Congressional hearings about the Stafford Act, "Only God would have the capacity to chronicle all of the overly rigid and asinine interpretations that communities around the United States have experienced" (Cooper, 2010, para. 8).

Organizations representing hazard mitigation and emergency management officials and communities have similarly opined. The National Emergency Management Association (NEMA) in testimony before Congress in 2010 complained about the increasing trend toward reduced flexibility and strict interpretations of the Act. NEMA's concern with the Stafford Act is not the provisions of the Act, but how FEMA promulgates the Act through its policies. Reported David Maxwell, representing NEMA in these hearings:

We have experienced reduced flexibility through unnecessarily strict interpretations of the law. These interpretations have led to more rigid regulations and policies not accurately reflecting the true intent of the Act. A majority of NEMA members agree the primary issue during disaster response rests not with the Stafford Act overall, but rather with disaster assistance policy. (Maxwell, 2010, p. 2)

Similarly in this vein, a draft 2009 NEMA White Paper entitled "Recommendations for an Effective National Mitigation Effort," calls for more focus on the use of intuition in determining whether a project is feasible and cost effective and less



focus on quantitative and bureaucratic review (NEMA, 2009). This recommendation is compelling in that the White Paper was endorsed by a vast array of stakeholders in the mitigation arena, among the following.

- The Association of Floodplain Managers
- American Public Works Association
- American Society of Civil Engineers
- Institute for Building Technology and Safety
- Institute for Business and Home Safety
- International Association of Emergency Managers
- International City/County Management Association
- National Association of Counties

The U.S. Council of Mayors, in a letter to President Obama in January 2010, called for several reforms to the Stafford Act, such as more consistency and less delays in the HMGP application process (U.S. Council of Mayors, 2010). Franklin Cownie, Mayor of the City of Des Moines, Iowa, speaking along with community officials, similarly expressed concerns about streamlining the process to determine HMGP eligibility.

Countering these concerns about complicated processes and rigidity reflect the tension between the perceived need of public agencies to ensure standardization and consistency against the need of recovering communities to return to normal quickly. FEMA, in its internal review of its public assistance program, seems to acknowledge this tension when seeking input from its stakeholders:

We have a challenge in providing financial assistance to disaster-affected communities quickly, while also ensuring proper fiscal accountability, and we have heard from numerous stakeholders that these processes can be difficult to understand, so we are seeking ways to improve our processes. (Ingram, 2011)

Underscoring stakeholders concerns is the likelihood that many communities do not have the resources to comply with these requirements. Often community officials wear many hats, rarely and only in larger jurisdictions, are local-

level employee charged solely with processing grants. Critics claim that this lack of resources and capabilities—coupled with FEMA’s complex and voluminous requirements, contribute to a slowing of the recovery process. A Department of Homeland Security Inspector General Report found that: “communities lack the necessary expertise, financial resources, and will to develop a hazard mitigation plan or implement mitigation projects” (Department of Homeland Security, 2009, p. 5). Regarding expertise, a 1992 study found that over half of Gulf Coast building officials did not understand code requirements relative to hurricanes (and the flooding associated therein) (Burby, 2006).

There is another view. What practitioners and emergency management officials might view as bureaucracy and red tape in FEMA Stafford Act activities, FEMA and others may consider as FEMA’s responsibility to use taxpayer dollars judiciously (disaster relief funds) and to comply with applicable laws and regulations that codify the law. In the post-Katrina environment, where FEMA received widespread and severe criticism on its response and recovery efforts—to include its actions related to Stafford Act and mitigation activities—it might be considered understandable that the agency may be reluctant to exercise laxity.

It is easy to understand FEMA’s apprehension to apply less rigid applications of the Stafford Act as a flurry of GAO and other reports criticize the agency for failing to safeguard taxpayer funding. A 2006 GAO report found that FEMA paid out over \$1 billion in improper and potentially improper payments under the Stafford Act’s Individual Assistance program (Government Accountability Office, 2006). A key reason cited for the improper payments was a breakdown of controls by FEMA. A 2007 report cited millions lost by FEMA as a result of lack of oversight over certain Stafford Act housing programs (Government Accountability Office, 2007). Related just to Katrina, one report found that FEMA’s lack of proper oversight of its contracting activities has led to an investigation of over 800 contractors for fraud, wrongful claims, and billing in excess of services provided (The Opportunity Agenda, 2005).

In some cases, the agency cannot win no matter what action it takes. What happened after Hurricane Katrina is illustrative of the criticisms FEMA receives from both sides: one side calling for more control and the other side calling for less control and red tape. In 2006, in the midst of massive reconstruction efforts after Katrina, FEMA's Acting Administrator for Mitigation and Federal Insurance relayed the need to protect taxpayer dollars in a press release:

FEMA has a responsibility to protect lives and property, and to ensure that disaster rebuilding efforts use the best data available. We also have a responsibility to ensure that Federal tax dollars are spent wisely and cost-effectively. It makes no sense to rebuild using outdated data. (FEMA, 2006c, p. 1)

In this and closely related instances, Maurstad was referring to guidance FEMA was issuing that required that rebuilding efforts consider more accurate flood risk data. In particular, the flood risk data drawn from the Katrina event, which generally meant that rebuilding efforts would need to meet significantly higher elevation requirements than those reflected on dated 1984 flood maps for southern Louisiana in particular. Some viewed these efforts as bureaucratic, uncaring, and unwanted. Reported LaFourche Parish President Charlotte Randolph, when commenting on post-Katrina flood risk data that would require more stringent reconstruction efforts, "There's definitely more flood risk included in these [flood risk] maps than we would have liked" (Buskey, 2010, p. 3). Yet others, such as J. Robert Hunter, Director of Insurance for the Consumer Federation of America, in testimony before Congress argued that "FEMA must not allow sympathy for beleaguered New Orleans residents to stop it from doing what is necessary. . . we cannot afford, as a nation, to allow rebuilding in high-risk areas without proper first-floor elevation" (Hunter, 2006, p. 2).

The call for more controls by government auditors and agencies would likely make FEMA a bit reticent to enter into less rigid applications of its programs. Yet, to the agency's credit, it is doing just that. As mentioned earlier in this thesis, FEMA is indeed undertaking a bottom-up review of its public assistance program. As discussed in Chapter III, in 2008, FEMA asked the National Advisory Council to recommend changes to simplify certain aspects of the Stafford Act. In 2010, the agency initiated a bottom-up

review of its administration of the Stafford Act Public Assistance Program to seek to increase program flexibility, identify ways to streamline the program, and to provide more community options (FEMA, 2010b; Ingram, 2010).

Another view is that what critics argue as bureaucracy and complexity is FEMA's demonstration of its role as a federal agency to be accountable to the people and taxpayers it serves. The Honorable Jocelyne Bourgon, President Emeritus of the Canada School of Public Service, defines the classical public administration model's employees—such as those employed by FEMA—as having first and foremost concern and regard for the rule of law and deploying integrity, probity and impartiality (Bourgon, 2007).

Lastly, some are encouraged by what they view as FEMA's progress in streamlining its mitigation programs. Testifying before Congress, the Emergency Management Director for a community recovering from a disaster opined: “While FEMA has been sluggish and bogged down by bureaucratic oversight in the past, there seems to be a revitalization of the attitude and purpose in the FEMA folks I have dealt with...” (Russell, 2011).

#### **E. THE TOP-DOWN HIERARCHY OF THE HMGP**

Yet another factor is associated with the Stafford Act's HMGP while less quantitative, serves to potentially sub optimize the effectiveness of the HMGP. This factor is the top-down hierarchy of the program with the federal government playing the central role and state and local jurisdictions playing a less empowered role. The decisional flow within this arrangement is typically one-way, from the federal government to the states or communities. States and communities operate by a federal structure, created by the federal government, and with a federal perspective. Arguably, this structure may foster a suboptimal framework. NEMA, a great supporter of the Stafford Act, argues that policies within the Act are created without full input from and coordination stakeholders, which further exacerbates the schism between feds and state and locals (NEMA, 2006). This author opines that this structure may diminish state and community initiative, and more importantly, inhibit creative approaches that state and

local jurisdictions might bring to the proverbial table. Studies abound about the efficacy of involving citizens in mitigation or other urban projects and endeavors. Brody, Godschalk, and Burby (2003, p. 246) point to studies indicating that involving citizens in local planning efforts builds trust and a commitment to the undertaking at hand and that including key stakeholders “early, often, and ongoing creates a sense of ownership that is frequently long-term in nature.” In concluding research about flood risk and community behavior conducted by three universities, the researchers made one key recommendation: “Flood risk management strategies must be accomplished locally and need to be developed in consultation with local stakeholders” (Sixth Framework Programme, 2008).

It logically follows then, that inverting the current fed to state/local pyramid and engaging states and communities with more involvement in the mitigation and risk assessment and reduction strategies inherent in the HMGP would yield greater results. The professionals in the hazard mitigation community share this assumption. Notably ASFPM (2011) has called upon FEMA to administer the Stafford Act in favor of more delegation of responsibilities to jurisdictions and under an umbrella of a more collaborative federal-state partnership and most importantly, designed to build state capabilities for reducing long-term hazard losses and suffering. Within this context, NEMA has similarly called for broader stakeholder engagement at all levels of government (NEMA, 2009).

## **F. CHAPTER SUMMARY**

The Stafford Act is the foundation of this country’s disaster assistance policy. It is the primary funding source for direct and indirect disaster assistance and for mitigating hazards in anticipation of future disasters. The incentive and enforcement provisions of the Stafford Act may be a key driver in influencing community and individual behaviors that affect the impact and costs of *future* flooding events. As currently written and as promulgated by FEMA, critics argue that the Act has shortcomings that are deterring behaviors and actions that have the potential to more effectively reduce the impact and costs of future flooding events. As discussed during this and earlier chapters, these shortcomings include allowing for reimbursement for repetitive losses without requiring

the recipient to take steps to mitigate against future losses, mitigation grant cost share ratios sometimes difficult to meet, and failure to consider tax loss revenues for communities seeking to remove structures from the floodplain. These shortcomings exist within a federal-centric hierarchy that may lead to bureaucracy and complicated processes while simultaneously diminishing a sense of ownership by those who benefit from and implement mitigation activities. Changing these conditions has the potential to reduce the impact and costs of flooding events in this country.

The following chapter describes the methodology and criteria used to evaluate the three policy options of this thesis.

THIS PAGE INTENTIONALLY LEFT BLANK

## IV. METHODOLOGY

### A. INTRODUCTION

One of the tenets of this thesis is that the impact and cost of flooding events impacts the resiliency and homeland security posture of this nation and its communities. Congress intended that the National Flood Insurance Program (NFIP) would be the primary national program that would reduce the costs and impacts of flooding. As explored previously in this paper, the program has not been effective in all aspects, and on the contrary, critics claim it has exacerbated the costs and impacts of flooding. The claim of this thesis is that the Stafford Act can, with changes, accomplish what the NFIP has not been able to accomplish, to reduce the impact and costs of flooding. The reader will recall that the Stafford Act is the nation’s primary policy for responding to and recovery from disasters. Thus, the research questions of this thesis explore what changes to the Stafford Act would reduce the costs and impacts of flooding events. Table 3 lists the research questions.

Table 3. Research Questions

<b>RESEARCH QUESTIONS</b>	
<b>Number</b>	<b>Question</b>
1	Would changes to the enforcement provisions of the Stafford Act reduce the impact and costs of flooding?
2	Would changes to the incentive provisions of the Stafford Act reduce the impact and costs of flooding?
3	Are there changes to how FEMA administers mitigation elements of the Stafford Act that would streamline the program and increase the likelihood of state and local buy in of mitigation efforts toward an end of reducing the future impact and costs of disasters, where flooding is component in 90% of all disasters (King, 2005)?



The mechanism for seeking to answer these research questions is a policy option analysis examining key aspects of the Stafford Act. The policy options analysis methodology was chosen to evaluate alternative courses of action to address that which the NFIP is unable to resolve satisfactorily, reducing the impact of future flooding events. The courses of action evaluated include examining both the enforcement aspects of the Stafford Act, as well as the incentive provisions of the Act. Examining the incentive provisions of the Act includes a review of possible changes that would bring about stronger grass roots support, and thus, buy in of mitigation efforts, to include flood mitigation activities.

A summary of the criteria used, as well as the scoring mechanism, are reflected in the matrix shown in Table 4. As discussed in Chapter I, the author created and designed this evaluative matrix and approach with the acknowledgement that it does not constitute a rigorous scientific inquiry to evaluating the policy options but is intended to serve as a general tool to guide the analysis of the policy options and to evaluate the options relative to each other. The criteria chosen are largely qualitative and together with the scores assigned reflect the author's research conducted as part of this thesis, as well as the author's professional experience. The author acknowledges the subjectivity of the criteria and scoring and that other researchers might approach this analysis with different criteria and scoring mechanisms and might reach different conclusions as a result of differing professional backgrounds and biases. While not absolute and definitive, the evaluative matrix is offered as a general tool and guide for decision makers.

## **B. EVALUATIVE CRITERIA**

The criteria used to evaluate these policy options are as shown below, along with the evaluative metrics characterized by a sliding scale from one to five in which a score of one indicates a lesser degree of implementation feasibility and a score of five indicates the greatest degree of implementation feasibility. Each of the policy options receives an overall score based on the evaluation of its feasibility. The maximum overall score that can be achieved—signifying the greatest feasibility—is forty.

### **1. Effectiveness**

This criterion considers the degree to which implementation would affect the impact and costs of flooding events, which is evaluated by an analysis of the projected costs and losses avoided in future flooding events.

### **2. Congressional Support**

In the often-emotional arena of recovering from flood-based disasters, Congressional support is a reflection of individual and collective support for existing and proposed measures. Congressional support is crucial to the ability to maintain existing and implementing new policies where lives and property are at stake, ways of life at risk, and individual and jurisdictional pocketbooks affected. This criterion is evaluated by a qualitative assessment of the likelihood of support.

### **3. Legality**

This criterion examines what is required for implementation; in other words, whether legislative, regulatory, or agency policy changes are necessary to effect a change to aspects of the Stafford Act, where ease of implementation is typically a change of Agency (FEMA) policy rather than a legislative change. The metric for this element assumes that changing law is more difficult, and hence, less feasible than changing federal regulations or agency policy.

### **4. Federal Costs**

This criterion examines the impact of existing and proposed policy changes in terms of federal costs in terms of the Disaster Relief Fund (DRF), such as, will the proposed mitigation effort or policy change increase the level of DRF allocated to a particular flooding disaster? This criterion also assesses the degree to which or if federal implementation and administration costs increase as a result of the proposal.

## **5. Burden to State and Local Stakeholders**

While federal policies may dictate or offer mitigation and flood control activities, adoption invariably occurs at the state and local jurisdictional level. The capabilities and financial resources of state and local communities, particularly in the current fiscal climate, often limit implementation of mitigation and flood-control efforts. Closely linked is the degree to which a proposal brings a reduction in complexity and level of effort required of those who must ultimately implement, those at the state and local level. Mitigation and floodplain managers at the local level often wear many hats and are often assigned these duties on a part-time basis. Many often lack the technical expertise required of what they may view as complex and often burdensome federal programs. Thus, a key element in evaluating proposed Stafford Act changes must include the viability to implement at the state and local level, and the metric for this element includes an assessment of the implementation costs, as well as changes in manpower and technical expertise associated with implementation.

## **6. Social and Cascading Impacts**

For every action, there is a reaction, which may not be equal and may not be opposite. Such is the case with each of the policy options considered in this thesis. There are the easily identifiable, easily quantifiable measures against which to measure each proposal, e.g., dollars saved, laws changed, but the less tangible but equally significant measures are the impacts to society at large, the second and third order impacts not so readily apparent. This criterion then, attempts to measure and gauge the societal and cascading impacts of each of the proposals.

## **C. CONCLUSION**

In conclusion, in evaluating the three policy options of this thesis, six criteria are used to assess the specific and overall feasibility of each proposal.

The next chapter outlines and analyzes policy option one and addresses the research question: Would changes to the enforcement provisions of the Stafford Act reduce the impact and costs of flooding?

Table 4. Policy Options Evaluation Matrix

<b>POLICY OPTIONS EVALUATION MATRIX</b>					
<b>CRITERIA</b>	<b>NUMERICAL SCORE</b>				
	<b>Less</b>		<b>↔</b>	<b>More</b>	
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Effectiveness	Results in no projected losses avoided	Results in minimal projected losses avoided	Results in moderate projected losses avoided	Results in significant projected losses avoided	Results in substantial projected losses avoided
Congressional Support	Highly unlikely	Somewhat unlikely	Equally likely and unlikely	Somewhat likely	Very Likely
Legality	Requires significant legislative change	Requires moderate legislative change	Requires minor legislative change	Requires change to code of federal regulations	Requires change to FEMA policy
Federal Costs to Implement and Administer	Significant increase in DRF expenditures	Moderate increase in DRF expenditures	Minimal increase in DRF expenditures	No change in DRF expenditures	Results in savings to the DRF
	Substantial increase in federal cost to administer	Moderate increase in federal cost to administer	Minimal increase in federal cost to administer	No increase in federal cost to administer	Reduction in federal cost to administer
Implementation and Administration Burden to State and Local Stakeholders	Substantially increases complexity	Moderately increases complexity	No change in complexity	Moderately reduces complexity	Significantly reduces complexity
	Requires substantial additional funding outlays	Requires moderate additional funding outlays	Requires no change in funding outlays	Moderately reduces funding outlays	Significantly reduces additional funding outlays

THIS PAGE INTENTIONALLY LEFT BLANK

## **V. POLICY OPTION ONE—ENFORCEMENT**

The Federal government should not repetitively reimburse eligible applicants for damage that could be prevented through mitigation efforts.

— (FEMA, 2009, p. 40125)

### **A. INTRODUCTION**

This chapter seeks to answer the research question: “Would changes to enforcement provisions of the Stafford Act reduce the impact and costs of flooding?”

The previous chapters discussed why the status quo—the NFIP—is not effective in reducing the costs and impacts of flooding and because of political, economic, and societal reasons, it feasibly cannot be substantially changed. This chapter seeks to look beyond the NFIP to an enforcement provision of Stafford Act as a means by which the effects of flooding can be mitigated, and thus, reduce the costs and impacts of flooding. In other words, this thesis claims that changes to the Stafford Act may be able to do what historically the NFIP has not—reduce disaster costs and impacts associated with flooding events. This chapter examines proposed changes to a key enforcement provision of the Stafford Act that has the capacity to reduce the costs and impacts of flooding.

This chapter is structured by beginning with an overview of the details of the three-strike rule proposal followed by an analysis of the impact of the proposal using the six criteria outlined in the methodology chapter of this thesis. The chapter ends with concluding observations by the author.

### **B. OVERVIEW OF THE THREE-STRIKE RULE**

Section 406 of the Stafford Act stipulates a reduction in the federal share to not less than 25% (normal share is 75%) for its public assistance program if the property were damaged on more than one occasion within the preceding 10-year period by the same type of event and the owner of the property has not taken appropriate measures to mitigate against the hazard that caused the damage. Within some FEMA circles, this

stipulation is known as the three-strike rule. Public assistance encompasses the repair, restoration, and replacement of public and certain private, nonprofit facilities and infrastructure, which typically includes buildings, roads, bridges, utility systems, and water and sewage systems. While this three-strike reduction in the federal share is now law, FEMA has not promulgated implementing guidance to make it a reality even though the Disaster Mitigation Action codified the provision into law in 2000. This policy option recommends that FEMA create an implementation policy to put into place the three-strike policy.

Critics argue that invoking this provision would reduce the penalty-free environment that allows states and communities to rebuild after a federally declared disaster at largely the expense of the federal government, without having to take active measures to mitigate the property or structure. As examined earlier, Public Assistance dollars are not an insignificant outlay to the Treasury, averaging \$3.3 billion per year (Ingram, 2011). As flooding is considered the most costly natural hazard (Kick et al., 2011), measures to increase mitigation activities under the umbrella of the public assistance program would reduce the impact and effects of flooding.

### **C. PROPOSAL: IMPLEMENT THE THREE-STRIKE RULE**

This author proposes that FEMA initiate steps to implement the three-strike rule. As stated earlier, the rule is already law as contained in the text of the Stafford Act. What is needed is implementing guidance. FEMA has already developed implanting guidance and published this proposed guidance in the Federal Register as recently as 2009. Under this proposal, FEMA would need to address the concerns raised during the last proposed rule publication and republish once again for public comment. After receiving and satisfactorily addressing public comment, FEMA would need to enact the provision by way of policy announcement.

### **D. ANALYSIS AND EVALUATION**

This section analyzes the impacts and projected outcomes associated with implementing the three-strike rule. The projected impacts and outcomes are evaluated

against qualitatively and quantitatively against six criteria with scores assigned to each criterion. A sum total is then presented as a means to evaluate the overall feasibility and impacts associated with implementation.

**1. Effectiveness. Would Implementing This Provision Reduce the Impact and Costs of Floods?**

The analysis provided by FEMA when introducing this proposed rule in 2009 conservatively estimated that \$66 million in public assistance disaster costs would be saved annually by implementing the three-strike rule (Federal Register, 2009). This amount was derived by reviewing the number of public assistance projects funded over the period 1998 to 2008 and determining those that sustained similar damage from a similar event at least twice over the 10-year period and for which mitigation measures had not been undertaken. FEMA determined that 2% of projects fell into this category. For calculation purposes, for those who sustained similar damage two or more times and had not mitigated, the federal cost share of public assistance was reduced from 75% of the cost to repair to 25 percent. Thus, based on FEMA's analysis, the measure would significantly reduce the costs of disasters and for the purpose of this thesis, flooding. By its own admission, however, FEMA's analysis is conservative, and this author argues that the actual savings would be significantly higher. Looking forward, having knowledge that jurisdictional coffers would suffer if mitigation measures were not undertaken, jurisdictions would likely take a more proactive stance on mitigation and their level of mitigation would increase; thus, the level of disaster assistance savings would increase. The anticipation factor would likely drive further mitigation efforts. Communities would not want to risk reduction of federal share. In starker terms, consider a damaged bridge sustaining \$500K damage from a flooding disaster. Without imposition of the three-strike rule, the home jurisdiction would be eligible for \$350K in repair or rebuilding disaster assistance under the Stafford Act Public Assistance program. Had this bridge been damaged by similar events within the previous 10 years, the jurisdiction would be eligible for only \$125K in disaster assistance, which would result in a jurisdictional loss of \$250K. Multiplied by the amount of public facilities and infrastructure, a reasoned jurisdiction would likely *anticipate* that it could not afford this type of loss of federal



support. The most important impact of implementing the three-strike rule is that while only 2% of the projects fell within the share reduction framework, it could be projected that a much higher percentage of properties would be mitigated because of the fear of loss of federal share—dire economic consequences—should a jurisdiction not take actions to mitigate. The Hazard Mitigation Grant Program (HMGP) provides mitigation funding on a 75% cost share basis as does Section 406 mitigation funding—both of which could be considered a funding source to mitigate the structures and properties falling under this provision.

Another reason the cost savings to taxpayers would be higher than that cited by FEMA is that a trend is emerging that may point to increasing the federal cost share of public assistance from 75% to 90 percent. While changing the cost share formula for political and economic reasons is not new, the Congressional Research Service in a 2010 report states, “While the authority to adjust the cost-share is long standing, the history of FEMA’s administrative adjustments and Congress’ legislative actions in this area, are of a more recent vintage” (McCarthy, 2010, p. 1). For example, for Hurricane Katrina, the HMGP cost share was reduced to zero. Similar reductions (10%) occurred for Hurricane Ike in Texas in 2008 and in recent storms in Kentucky and Kansas (Bea, 2010). Should this trend continue and further materialize, implementation of the three-strike rule would create a greater incentive for communities to undertake actions to mitigate. Further, failure to do so would result in a greater costs savings to taxpayers by way of reduction in the federal share of public assistance from 90% to 25% as opposed to 75% to 25 percent.

Scoring: 5 out of 5. For the reasons cited above, this measure would substantially reduce the costs of flooding.

## **2. Is There Congressional Support to Enforce This Provision?**

On one hand, it can be viewed that since Congress has already passed this provision of the Act, Congressional support need not be a concern. Alternatively, as discussed earlier in this thesis, this country has witnessed Congressional passage of provisions of the NFIP—that bore down financially on their constituents—that Congress later sought to circumvent or reverse, which could happen if there is sufficient public

outry. The Public Risk Management Association (PRIMA) has opined that the provision, if implemented, places a burden on already financially strapped communities and would require communities to expend considerable effort seeking out grant funding for mitigation (PRIMA, 2010). If sentiment of this type becomes widespread, then members of Congress might weigh in to halt implementation of this proposal. Two other major organizations, however, the National League of Cities (Borut, 2009) and the American Public Works Association, did *not* cite similar concerns when this provision was open for public comment in 2009.

Indications point to some degree of Congressional support for the three-strike rule, however. Using fire as an example, Congressman Blumenauer of Oregon has said this about strengthening the nation’s natural hazard resiliency: “The second or third time places burn in a fire zone, end the mortgage deduction. Send a message. Putting people in harm’s way repeatedly ought not to be a way of life” (Sawyer & Tuckman, 2010, para. 3). This type of sentiment may grow in light of the national debt situation and a Congress looking for ways to trim the federal budget. Reducing disaster outlays by way of implanting this proposal may be one area ripe for consideration.

Scoring: 1.5 out of 5. It is likely to be considerable Congressional opposition to this proposal.

### **3. Legality: What Is Required to Implement This Provision?**

As the provision is already enacted in law, the requirement for implementation is for FEMA to codify into regulation, which requires public notice by way of the Federal Register and an opportunity for the community to comment on the proposal. Economic, congressional, and social factors aside, implementation of this provision is comparatively simple—creating regulations as opposed to legislation.

Scoring: 4 out of 5. Implementation requires changing the Code of Federal Regulations.

#### **4. What Are the Federal Costs to Implement?**

For this evaluation criterion, two factors are examined: impact to the Disaster Relief Fund (DRF) and the federal cost to implement and administer the three-strike rule.

##### *a. Disaster Relief Fund (DRF) Costs*

The reader will recall that the DRF funds the disaster assistance awarded under the Stafford Act. Congress appropriates the DRF on an as-needed basis. Implementing the three-strike rule could impact the DRF in a variety of ways. It is reasonable to project that the prospect of receiving reduced federal share for public assistance funding will drive many jurisdictions to seek to mitigate public facilities and infrastructure. The source of funding for these mitigation activities may impact DRF expenditures.

A key source of funding for Stafford Act mitigation measures is the Hazard Mitigation Grant Program (HMGP) and Section 406 of the Stafford Act. Those seeking to avoid three-strike rule cost-share decrements will not increase DRF expenditures if they mitigate by way of the HMGP as its funding is statutorily capped; they will, however, increase DRF costs if they choose to mitigate by way of Section 406 mitigation.

HMGP funding is generally capped at 15 percent of the aggregate costs of eligible federal disaster assistance under a particular disaster. Thus, this DRF venue would not realize a net increase in expenditures. Rather, it would likely result in a shifting of priorities. For example, rather than mitigating infrastructure that has not been subject to repeat losses, a community may opt instead to mitigate infrastructure that has suffered repetitive losses.

However, if jurisdictions use Section 406 funding to mitigate structures as a way to avoid the decrements of the three-strike rule, then DRF outlays may increase because Section 406 funding is considered discretionary funding under the public assistance umbrella, and unlike HMGP funding, no established funding cap exists. Section 406 expenditures increase the amount of DRF funding required. The reader will

recall that PA funding is used to repair, restore, or rebuild a facility or infrastructure under a federally declared disaster. The facility is generally restored to its original condition. Section 406 funding is funding to mitigate that which is already being restored or replaced under the public assistance program. It is considered unlikely, however, that Section 406 funding will be the first choice of mitigation funding in that many emergency managers view Section 406 as a source of delay in the rebuilding process because certain Stafford Act environmental rules come into play whenever a building, under the guise of Public Assistance work, is built beyond its original condition, which can occur easily when a structure is undergoing mitigation efforts. When a structure or infrastructure is rebuilt beyond its original condition, National Environmental PA rules come into play that sometimes require an environmental and historic preservation evaluation of the work being done. Emergency managers feel that this slows down the process. Whereas building it back to original condition requires no environmental review, building it back beyond its original condition to a mitigated level invokes an environmental review.

In conclusion, it is projected that DRF costs are unlikely to increase significantly as a result of implementing the three-strike rule because the likely source of funding for mitigating public buildings and infrastructure is likely to be from a source—the HMGP—that is already capped, and where the result will be a shifting of mitigation priorities within that cap.

Scoring: 3 out of 5. A minimal increase in DRF expenditures is projected.

***b. Federal Implementation and Administration Costs***

The federal cost to implement would be minimal and insignificant, reports FEMA in its 2009 proposed rule for the three-strike rule. Implementation would require the tracking of repetitive loss structures or systems and FEMA states that it would do this by tracking applicant's latitudinal and longitudinal coordinates, which the agency already does for public assistance.

Scoring: 4 out of 5. It is projected federal costs would not increase outside of normal recurring overhead costs to implement or administer the program.

**5. What Is the Burden of Implementation to State and Community Officials?**

This evaluation criterion reviews the overall burden to implementing jurisdictions—a frequent concern of state and local officials charged with implementing the Stafford Act. Two categories are examined when considering the implementation burden to state and local officials: 1) complexity and 2) funding outlays.

*a. Complexity*

Implementation of the three-strike rule is not projected to significantly increase manpower needs, require greater levels of technical expertise by implementing officials, or increase the complexity of program administration. It is anticipated, however, that some level of effort at the community or local level to track types of losses and the hazards that caused them may be necessary to consider when attempting to mitigate to avoid loss of public assistance funding or to anticipate the financial impact associated with the potential loss of public assistance funding.

Scoring: 2 out of 5. It is projected that a moderate level of increase in complexity occurs in terms of tracking losses and the hazards associated with them.

*b. Funding Outlays*

Communities may chose to track repetitive loss properties or may rely on FEMA to do so. If communities conduct the tracking, then it may be considered an additional workload requirement with costs commensurate to the cost of labor.

Scoring: 2.5 out of 5. It is projected that minimal increase in labor costs occurs as state and local entities seek to track their repetitive loss statistics.

**6. What Are the Social and Cascading Impacts Associated with Implementation?**

Critics of the provision might argue that it places an unfair burden on already financially strained jurisdictions. The financial burden could be viewed as twofold: the requirement to fund mitigation efforts in lieu of losing repair and restoration public

assistance funds and the financial consequences of not conducting mitigation efforts. It could be viewed as a lose-lose for states and jurisdictions. Alternatively, others cite the jurisdictions are to blame for being in the situation in which they find themselves. In terms of funding, it is, after all, the community officials of these jurisdictions who allowed floodplain development in their communities or failed to take actions to mitigate existing structures in the flood zones. These land-use decisions have often impacted their constituents who often did not have a vote or a say in—or even knowledge of—the decisions being made and their consequences. Under the three-strike rule, these land-use and planning decisions now come to bear on the decision makers, the owners of the public infrastructure.

Blame aside, at the local level, the social and cascading impacts will be that more community and state funding likely will be dedicated to mitigation efforts. In a cash-strapped environment, communities will be required to make hard choices on what public services are offered or curtailed. It could also translate into higher property and sales taxes as communities find a way to offset loss revenue spent on mitigation efforts.

At a broader level and longer term, full-scale implementation of this measure would reduce disaster costs, as mitigated structures would suffer less damage than unmitigated structures. The impact, depending on how Congress treats the savings, results in taxpayers enduring less of a tax burden.

Scoring: 2.5 out of 5. It is projected that imposing the three-strike rule would result in a moderate level of positive social change, but a moderate level of negative cascading impacts would also occur in terms of potentially changing funding priorities at state and local levels. It is anticipated that initially, the negative impacts would outweigh the positive. Over time, as more structures become mitigated or removed from flood-prone areas, the impact on local coffers will be reduced.

## **E. RECAP OF ANALYSIS**

Table 5 depicts the total scoring after analyzing the projected impacts of implementing the three-strike rule against each criterion. The overall score for implementing this measure is 24.5 points out of a total of 40 possible points.

Table 5. Evaluation Scoring Results for the Three-Strike Rule

EVALUATION SCORING RESULTS FOR THE THREE-STRIKE RULE						
CRITERIA	NUMERICAL SCORE					Score
	Less		↔	More		
	1	2	3	4	5	
Effectiveness	Results in no projected losses avoided	Results in minimal projected losses avoided	Results in moderate projected losses avoided	Results in significant projected losses avoided	Results in substantial projected losses avoided	5
Congressional Support	Highly unlikely	Somewhat unlikely	Equally likely and unlikely	Somewhat likely	Very Likely	1.5
Legality	Requires significant legislative change	Requires moderate legislative change	Requires minor legislative change	Requires change to code of federal regulations	Requires change to FEMA policy	4
Federal Costs to Implement and Administer	Significant increase in DRF expenditures	Moderate increase in DRF expenditures	Minimal increase in DRF expenditures	No change in DRF expenditures	Results in savings to the DRF	3
	Substantial increase in federal cost to administer	Moderate increase in federal cost to administer	Minimal increase in federal cost to administer	No increase in federal cost to administer	Reduction in federal cost to administer	4
Implementation and Administration Burden to State and Local Stakeholders	Substantially increases complexity	Moderately increases complexity	No change in complexity	Moderately reduces complexity	Significantly reduces complexity	2
	Requires substantial additional funding outlays	Requires moderate additional funding outlays	Requires no change in funding outlays	Moderately reduces funding outlays	Significantly reduces additional funding outlays	2.5
Social and Cascading Impacts	Results in significant negative social change and cascading impacts	Results in moderate negative social change and cascading impacts	Results in no negative social change and cascading impacts	Results in moderate positive social change and cascading impacts	Results in significant positive social change and cascading impacts	2.5
<b>SCORE</b>						<b>24.5 out of 40</b>

## F. CONCLUSION

Reducing the impact and costs of flooding events in this country requires the courage of its citizens and its politicians to stop rewarding those who, despite repetitive losses, do not take actions to mitigate against that risk. The end result of this reward scheme is the transference of the risk from the owners and the communities to the federal government and taxpayers. While a majority of disasters in this country include a flooding component, taking steps to minimize transferring this flood risk or reducing or eliminating the risk has the potential to reduce the impact and costs of flooding events in this country. Invoking the three-strike rule is one way to reduce the transference of risk

and rewarding failure to take action to mitigate. Arguably, it is not an easy fix and not without considerable political and community pushback. Future chapters in this thesis, however, provide mechanisms that have the potential to ease the financial impact of invoking the three-strike rule.

While this chapter examined a key enforcement provision of the Stafford Act, the next chapter examines incentive provisions of the Act, and how altering these provisions may provide a means to reduce the impact and costs of future flooding events.



THIS PAGE INTENTIONALLY LEFT BLANK

## **VI. POLICY OPTION TWO—INCENTIVES**

Hazard mitigation is the only phase of emergency management specifically dedicated to breaking the cycle of damage, reconstruction, and repeated damage.

— (FEMA, 2011e)

### **A. INTRODUCTION**

While the previous chapter focused on the stick in the ‘carrot or the stick’ analogy, this chapter focuses on the carrot in seeking to answer the research question: “Would changes to incentive provisions of the Stafford Act reduce the impact and costs of flooding?” Two proposals under the Stafford Act’s Hazard Mitigation Grant Program (HMGP) are offered. One proposal involves reducing the non-federal match of the HMGP and the second proposal suggests changes to the HMGP property acquisition, relocation, and demolition program.

The chapter is structured by beginning with a contextual insight into the role of disaster assistance and fiscal federalism followed by an overview of the HMGP, an outline of proposal two, background specific to the proposal, followed by an analysis and evaluation of the proposal using criteria outlined in the methodology chapter of this thesis. Proposal two follows the same structure as proposal one. The conclusion section ends the chapter.

### **B. CONTEXT**

Each of the proposals presented in this chapter recommend increasing the availability and level of federal assistance to sub national governments, i.e., a state or local community. This author acknowledges that this notion rests within a larger policy question beyond the scope of this thesis: Who pays for disaster relief, the federal government or sub national elements, how much does each pay, and what are the ramifications associated with altering the balance of fiscal responsibility between the

two? These questions and their answers center on the concept of fiscal federalism and the role of the federal government intervening in and impacting upon sub national governmental affairs, e.g., local and country jurisdictions and states.

Central to this discussion is the moral hazard that the role of the federal government in disaster relief may bring. Critics argue that by providing disaster relief, the federal government is causing sub national governments and individuals to act in ways that they would not, absent the availability of this aid (Wildasin, 2007).

Goodspeed and Haughwout (2007, p. 1) speak to the tension that results from the situation in the United States with “regional governments providing protection from disasters and [the] federal government providing insurance against their occurrence.” On one hand, sub national governments rely upon the federal government to provide financial aid and resources after a disaster, but on the other hand, these same governments are responsible for establishing the infrastructure and preparedness mechanisms to respond and recover from natural and manmade hazards (Goodspeed & Haughwout, 2007). Arguably, those who seek to gain the most from federal disaster assistance—sub national governmental entities—are those whose gain economically by not spending dollars on disaster avoidance (preparedness, mitigation).

Also significant to this discussion is the balance between federal aid and local or state aid. The authors of the Betsey Study—the study that greatly influenced the framework for the NFIP—recognized the role that cost sharing might play in a disaster assistance policy venue. This sentiment is applicable to the cost share issue discussed in this chapter:

When the beneficiaries of flood protection bear little or no part of the cost imposed upon society, principles of economic efficiency and of equity are violated and local development is distorted. Cost sharing, therefore, is a key feature in advancing national efforts to manage flood losses. (U.S. Congress, 1966b p. 41)

The seminal 1994 Galloway Report argued similarly, stating that “State and local governments must have a fiscal stake in floodplain management; without this stake, few incentives exist for them to be fully involved in floodplain management (Federal Interagency Floodplain Management Task Force, 1994).

### **C. OVERVIEW OF THE HMGP**

The HMGP is the primary source of mitigation funding within the Stafford Act. It is activated *after a* federally declared disaster and is funded by the Disaster Relief Fund on a sliding scale, at an amount equal to 15% of certain disaster costs associated with a particular disaster.<sup>4</sup> HMGP funds are provided as an incentive to undertake mitigation measures to prevent future losses. In that flooding is considered the nation’s most common hazard (FEMA, 2011d), the HMGP has the potential to be a key means by which the impact and costs of flooding is reduced. Its activation is during the brief window of opportunity when people are more susceptible to consider changing the course of events to preclude future damages (Godschalk, Brody, & Burby, 2003). Offering the right package with the right incentives during this window can make the difference in whether and how mitigation is undertaken.

The HMGP funds mitigation activities for all natural hazards. With regards to flood mitigation, elevating structures, structural relocations, property buy outs, retrofitting structures to reduce flood risk, and utility tie downs are among the eligible activities. Mitigation works. A study conducted by the Multi-Hazard Mitigation Council in 2005 revealed that for every dollar spent on mitigation, four dollars is saved (National Institute of Building Sciences, 2010). The savings for flood-related mitigation is even higher, with five dollars saved for every dollar spent (Department of Homeland Security, 2009). The National Emergency Managers Association illustrated one of the many examples of this savings in Congressional testimony in 2003. During Hurricane Isabel, 220 homes in the Bell Haven, North Carolina (Beaufort County) were elevated with HMGP funds after Hurricane Fran in 1996 did not flood, despite significant flooding on

---

<sup>4</sup> The percentage is decreased for larger disasters.

the Pungo River. This example shows that HMGP works (Review of the General Accounting Office Report on FEMA's Activities After the Terrorist Attacks on September 11, 2001, 2003).

A central claim of this thesis is that the HMGP could yield greater results if some of its provisions were changed. In terms of this thesis, yielding greater results translates into reducing the impact and costs of flooding. The following paragraphs offer two separate HMGP proposals for change are offered and evaluated. The first proposal involves changing the non-federal share match, and the second proposal involves changing acquisition, demolition, and relocation provisions.

#### **D. PROPOSAL. CHANGE THE MATCH REQUIREMENT**

##### **1. Proposal Specifics**

The proposal involves amending the Stafford Act's HMGP to reduce the non-federal share match requirement between FEMA and states from the current 25% level to a 10% level. Under this proposal, states would have the flexibility to determine the non-federal share agreement with their sub grantees as individual states deem appropriate and financially feasible for their sub grantees. For example, one community with greater financial resources might be required to continue to pay the current base 25% non-federal share whereby a group of citizens with less financial resources and seeking buy outs of their properties would not be required to pay the non-federal share. Decreasing the non-federal cost share from 25% to 10% at the state level increases the funding flexibility of a state to reduce or eliminate the cost shares for communities or individuals who may not have the capability to meet fully the 25% share while retaining a state's ability to require the 25% or more cost share for communities that do have the financial resources. Table 6 best illustrates the flexibility this proposal affords a state.

It is important to note, however, that under this proposal, the HMGP would remain capped at current levels, that is, 15% of federal disaster costs, and as such, this proposal would not increase funding outlays from the Disaster Relief Fund (DRF).

Table 6. \$1M HMGP Disaster Cap Scenario

<b>\$1M HMG Program Disaster Cap Scenario</b>				
<b>Current 25% Non-Federal Match Scenario</b>				
<b>City</b>	<b>Mitigation Project Request</b>	<b>HMGP Funds Received by State (75% of Project Costs)</b>	<b>State Allocation to City</b>	<b>Non-Federal Share City Must Fund</b>
Detroit	\$500,000	\$750,000 (75% of \$1,000,000)	\$375,000 (75%)	\$125,000
Lansing	\$500,000		\$375,000 (75%)	\$125,000
<b>Proposed 10% Non-Federal Match Scenario State Exercises Discretion in Requirement for Non-Federal Match</b>				
<b>City</b>	<b>Mitigation Project Request</b>	<b>HMGP Funds Received by State (90% of Project Costs)</b>	<b>State Allocation to City</b>	<b>Non-Federal Share City Must Fund</b>
Detroit	\$500,000	\$900,000 (90% of \$1,000,000)	\$500,000 (100%)	\$0
Lansing	\$500,000		\$375,000 (75%)	\$125,000

## 2. Background Specific to the Proposal

In its current form, the HMGP funding is channeled from FEMA to states (the grantee) when a federal disaster is declared and on a 75% federal cost-share basis. The HMGP relationship between FEMA and the state is that the state funds the remaining 25% non-federal share. The state then determines where to direct the HMGP funding and under what cost-share basis. The state can choose to fund state-level mitigation programs or it can direct the funds to local communities or individuals. How a state determines where to seek this 25% non-federal share match is at the discretion of the state. Sometimes states fund the 25% share from state coffers but often the state passes the share requirement on to the applicable community jurisdiction.

Both anecdotally and by formal studies, the non-federal cost share has been identified as a primary inhibitor to mitigating properties from natural hazards, particularly flooding events. Simply put, communities and individuals often do not have the resources

to meet the 25% match, particularly in the current economic climate of the nation, which is especially true after a disaster when the cost of cleaning up a disaster can significantly deplete a community's resources.

The affordability of the 25% non-federal cost share is problematic in two ways: 1) Mitigation may not be accomplished because communities and individuals cannot afford the cost share, and 2) Mitigation activity may be effected based on the ability of grant applicants to afford the non-federal cost share, not necessarily where the greater need exists.

By way of illustration, consider the ability of a city like Detroit, with a \$4.9B deficit (BusinessInsider.com, 2011) to come up with matching funding for a multi-million dollar storm drainage project to reduce flooding. In this case, the storm drain project likely will not be accomplished. Consider then, where will the state of Michigan channel the HMGP funding? Very likely, it will go to the community that can afford the match, not necessarily, where the greatest need or greatest impact actually is.

On an individual level, consider that FEMA officials report that the cost to elevate a house typically can easily cost from \$100,000 (Norton, 2009) to \$240,000 to \$260,000 (Baxter, 2011). What average citizen or family can afford to pay the 25% cost share out—of-pocket to elevate their structure? Affordability may not be an issue in a community or state better off financially and that can fund the cost share on behalf of the individual homeowner. The likelihood of a state or community to absorb the non-federal match is linked to its ability to pay. Poorer states and communities have fewer opportunities to absorb the cost share for their constituents. In Santa Monica, for example, where in 2010 the city enjoyed \$7.4 million budget surplus (Herrera, 2011), individuals needing to elevate their home is far likelier to have the non-federal match funded by the city.

The affordability issue is exacerbated by the fact that citizens often perceive low benefit/cost ratios associated with mitigation and do not always consider mitigation a good investment in their area or one that increases property resale values (Kunreuther, 1996).

While this thesis argues in favor of changing the match requirement, Wildasin (2008) argues that the non-federal match or the amount the sub national government or individual pays represents the local effort or commitment to the federal policy being addressed through the federal grant in question. It might be questioned whether reducing the non-federal match is reducing the buy in and commitment of the local government.

## **E. ANALYSIS AND EVALUATION**

This section analyzes the impacts and projected outcomes associated with implementing the proposal to change the non-federal match agreement between FEMA and individual states from 25% to 10 percent. The projected impacts and outcomes are evaluated quantitatively and qualitatively against six criteria with numerical scores assigned to each criterion. A sum total is then presented as a means to consider the overall feasibility and impacts associated with implementation.

### **1. Effectiveness. Would Implementing this Provision Reduce the Impact and Costs of Floods?**

This author maintains the answer is yes because implementation significantly reduces the most frequently cited barrier to mitigation under the auspices of federal mitigation grants; in other words, the ability to meet the non-federal cost share. The University of North Carolina conducted a comprehensive study in 2006 related to repetitive flood loss property owners, and the study revealed that the availability of funding to meet the non-federal cost share was the key determinant in individual participation in mitigation efforts. In this study of flood-prone communities scattered throughout the nation, it was determined that individual homeowners were six and one half times more likely to mitigate if no cost share was involved. More specifically, low-income and middle-income repetitive loss property owners were 12.1 and 2.6 times more likely to accept mitigation offers when the non-federal match was met than more affluent repetitive loss property owners (Fraser, Doyle, & Young, 2006). These findings are significant in that within the NFIP, repetitive flood loss policyholders account for up to 30% of the insurance claims for the entire program (Government Accountability Office, 2010b).



A series of studies conducted by the Florida Catastrophic Storm Risk Management Center (FCSRMC) provides further evidence that individual residents have a difficult time raising with mitigation match funding. Referring to this affordability issue, one community official commented: “I have grant money I can’t give away. Not enough homeowners even apply despite efforts to advertise the program to the entire community” (FCSRMC, 2011, p. 9). In Mississippi, in the aftermath of Hurricane Katrina, the burden of mitigation cost share and finding in-kind offsets proved so difficult that that the state hired a contractor to devote full-time efforts to solving this dilemma. The state’s request for bids stated: “Local governments have difficulty meeting non-federal match requirements as a result of reduced property tax revenues and increased recovery-related spending after Hurricane Katrina” (Mississippi Department of Finance and Administration, 2007, p. 2).

As this proposal would reduce the cost share affordability barrier, it would provide a greater incentive and means to mitigate. Also, under this proposal, the individual state would be required to determine where and how to impose the non-federal cost share requirement. As the state has greater resources at its disposal (90% vs. 75% of the federal share), it has greater capacity and flexibility to fund those communities or individuals least likely to be able to pay the non-federal share.

It could be argued that all else being equal, and without an increase in the disaster-based DRF allocation of HMGP funds provided to the state, this proposal would result in a decrease in mitigation activities. However, while less structures or systems may be mitigated, it is likely that the mitigation projects with a greater need would be accomplished. This author opines that under this proposal, the potential for more direct use of HMGP funding for activities directly mitigation related will likely be increased.

A different element to consider in evaluating this proposal is if the ceiling on the DRF is not changed yet the federal cost share is increased, it holds that less properties would be mitigated. Thus, while the state and localities enjoy less of a burden financially to mitigate, overall, less properties would be mitigated. This factor has been calculated in the scoring shown below.

Scoring: 4.5 out of 5. This measure would result in substantial losses avoided.

## **2. Is There Congressional Support for This Proposal?**

It is anticipated that Congressional leaders would support the measure in that it has the potential to directly reduce the upfront financial burdens of constituent communities and citizens. No anticipated negative consequences for a Congressional leader exist to support this proposal. Down the road, however, implementing this policy will likely involve some degree of political and citizenry pushback if an individual state does not involve broad Congressional and stakeholder involvement upfront in determining which communities will and will not benefit from changes in match requirements. If the state policy is not transparent and considered equitable, second-and third-order political issues will develop.

Scoring: 5 out of 5. Congressional members would very likely support this measure.

## **3. Legality: What Is Required to Implement This Provision?**

The Stafford Act would have to be amended to implement this proposal; however, the amount of change is not broad or extensive.

Scoring: 3 out of 5. This proposal would require minor legislative change.

## **4. What Are the Federal Costs to Implement?**

For this evaluation criterion, two factors are examined: impact to the Disaster Relief Fund (DRF) and the federal cost to implement and administer the three-strike rule.

### ***a. Disaster Relief Fund Costs***

No impact to the Disaster Relief Fund would occur. Under this proposal, the cap on the funds available under the DRF remains unchanged.

Scoring: 4 out of 5. No projected increase in DRF expenditures under this proposal would occur.

*b. Federal Implementation and Administration Costs*

As this proposal involves changing law, it is anticipated that some level of effort would be required in terms of FEMA or the Department of Homeland Security in seeking advocates and lobbying for the support of Congressional leaders. After passing the legislative process and being made into law, FEMA would be required to establish implementing regulations and offer public comment not unlike it does frequently for other Stafford Act or program initiatives. Some level of effort would be required by FEMA to educate state hazard mitigation officers and Congressional members as to the nuances of the law.

Scoring: 4 out of 5. This measure would likely be considered a recurring fixed cost of operating at a federal level, and thus, no increase in federal outlays occurs.

**5. What Is the Burden of Implementation to State and Community Officials?**

This evaluation criterion reviews the overall burden to implementing jurisdictions. Examining the implementation burden to state and local officials considers two categories: 1) complexity, and 2) funding outlays.

*a. Complexity*

Scoring: 2 out of 5. The level of complexity will likely be moderate, both initially and throughout the administration of the program at the state level because each individual state will need to define criteria or an approach for determining which entities will benefit from reductions in non-federal match requirements. Each state will undoubtedly spend a good deal of effort and resources in explaining its actions, whether complex and even when not complex. At a local jurisdictional level, it is not anticipated that any increase in program complexity or level of administration effort would arise, and it is likely that for those who will benefit from elimination or reduced non-federal match requirements, the complexity and burden of administration will be less.

***b. Funding Outlays***

At the state level, it is anticipated that implementation will be considered part of the normal overhead costs of a state in developing policy based on new legislation and then distributing and implementing the policy; thus, an increase in funding outlays is not projected. It is worthwhile to note that under the auspices of the HMGP, each state receives what is known as management cost funding for administration of the HMGP. The amount is set at a fixed percentage of the specified costs of a disaster. Overhead costs for the implementation of this proposal would be funded by these management costs. At the local level, no anticipated funding outlays outside of the normal overhead costs associated with grants management expected.

Scoring: 3 out of 5. No anticipated increase in costs at the state or local level.

**6. What Are the Social and Cascading Impacts Associated with Implementation?**

Individual states would need to establish policies and educate their stakeholders on how the non-federal match would be determined and under what circumstances. It is anticipated that individual states would require courage and fortitude in making funding decisions based on ability to pay, and recognizing that pushback by those who do have the ability to pay the non-federal match is likely.

If implemented as envisioned, the cascading impacts of this proposal are much like other federal programs in that those who do not have the ability to pay for a benefit, in this case mitigation, are funded at the expense of those who do have funds. The social impacts of implementing this provision are not unlike other federal grant programs in that federal taxpayer dollars are redistributed to meet a public need.

Scoring: 3 out of 5. Significant positive social and cascading impacts are associated with this proposal.

## F. RECAP OF ANALYSIS

Table 7 depicts the total scoring after analyzing the projected impacts of implementing the proposal to change the non-federal match. The overall score for implementing this measure is 24.5 points out of a total of 40 possible points.

Table 7. Evaluation Scoring Results for Changing HMGP Match Formula

<b>EVALUATION SCORING RESULTS FOR CHANGING HMG PROGRAM MATCH FORMULA</b>						
<b>CRITERIA</b>	<b>NUMERICAL SCORE</b>					<b>Score</b>
	<b>Less</b>		<b>↔</b>	<b>More</b>		
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	
Effectiveness	Results in no projected losses avoided	Results in minimal projected losses avoided	Results in moderate projected losses avoided	Results in significant projected losses avoided	Results in substantial projected losses avoided	<b>5</b>
Congressional Support	Highly unlikely	Somewhat unlikely	Equally likely and unlikely	Somewhat likely	Very Likely	<b>1.5</b>
Legality	Requires significant legislative change	Requires moderate legislative change	Requires minor legislative change	Requires change to code of federal regulations	Requires change to FEMA policy	<b>4</b>
Federal Costs to Implement and Administer	Significant increase in DRF expenditures	Moderate increase in DRF expenditures	Minimal increase in DRF expenditures	No change in DRF expenditures	Results in savings to the DRF	<b>3</b>
	Substantial increase in federal cost to administer	Moderate increase in federal cost to administer	Minimal increase in federal cost to administer	No increase in federal cost to administer	Reduction in federal cost to administer	<b>4</b>
Implementation and Administration Burden to State and Local Stakeholders	Substantially increases complexity	Moderately increases complexity	No change in complexity	Moderately reduces complexity	Significantly reduces complexity	<b>2</b>
	Requires substantial additional funding outlays	Requires moderate additional funding outlays	Requires no change in funding outlays	Moderately reduces funding outlays	Significantly reduces additional funding outlays	<b>2.5</b>
Social and Cascading Impacts	Results in significant negative social change and cascading impacts	Results in moderate negative social change and cascading impacts	Results in no negative social change and cascading impacts	Results in moderate positive social change and cascading impacts	Results in significant positive social change and cascading impacts	<b>2.5</b>
<b>SCORE</b>						<b>24.5 out of 40</b>

## **G. PROPOSAL: EXPAND BUY-OUT OPTIONS**

### **1. Proposal Specifics**

For those flood-damaged properties being considered for removal from the floodplain under the auspices of the Stafford Act's HMGP, this proposal calls for amending FEMA program guidance to allow for the provision of anticipated loss of tax revenues as part of the grant award when the purpose of the grant is to buy out flood damaged properties. In other words, increase the grant award amount to include anticipated tax loss revenues the community will experience as a result of restoring the bought-out property to green space when no or very little opportunity exists to generate taxes for community coffers. By providing this tax loss offset for 2–5 years after the effective date of the buyout, the affected community will have a reasonable amount of time to seek alternative tax base sources or to alter spending patterns commensurate with the loss of tax revenues. This timeframe will serve to remove a barrier to permanently removing properties from the floodplain. The tax revenues considered in this proposal include property and other community-wide taxes (e.g., school taxes) but not sales taxes.

### **2. Background Specific to the Proposal**

The reader will recall that the goal of the Stafford Act HMGP is to reduce the effects of natural hazards by taking steps to mitigate against these hazards. One of the most effective ways to reduce flooding costs and impacts is to clear flood-prone areas of development and structures permanently and to restore or conserve the floodplain to its natural function (FEMA, 2010e). No development translates to no damage or impacts when a flood occurs. The Stafford Act recognizes this situation by funding the acquisition, demolition, and relocation of properties damaged by flooding events. For acquisitions, FEMA does not acquire the properties in question; rather, the sponsoring community acquires the properties within the HMGP prevailing cost-share framework. Under this scenario, the community buys out the property from the current owner and then demolishes the structure. The community then is responsible to restore the underlying land to green or open-use space into perpetuity. Another scenario under this

provision is for the HMGP to fund the relocation of flood-damaged properties from out of the floodplain and into a non-flood prone area. These two scenarios, known collectively as the HMGP buy-out program, have been used throughout the United States on a voluntary basis. FEMA reports that since 1993, over 20,000 properties have been removed from the floodplain as a result of this program (FEMA, 2010c).

Removing properties from the floodplain is cost effective. After the Midwest floods of 1993, St Charles County, Missouri acquired 1,400 flood-damaged properties under the HMGP. When the Midwest Flood of 2008 again brought what locals consider equally severe flooding to St Charles, only \$12,000 in FEMA individual assistance was required, as compared to the \$1.6M dispensed during the 1993 floods (FEMA, 2009). Community officials attribute this reduced amount to the success of the buyout program. Per Sheila Huddleston, the State's Hazard Mitigation Officer: "We are seeing that it pays to break the repetitive cycle of flooding and rebuilding" (Gazette Staff, 2010).

A claim of this thesis is that the HMGP buy-out provision might be more extensively applied if a key barrier to its implementation is addressed. This barrier is the associated tax revenue loss a community incurs when a community removes a structure from its tax base. Already economically impacted after a disaster, it is not always realistic to expect community officials to add to that economic condition by reducing their tax base through buy out of properties in the floodplain. In addition, this buy out decision occurs at a time when a flood or hurricane damaged community is likely already experiencing the loss of population and tax revenues. After Hurricane Ike in Texas in 2008, Texas officials estimated some communities were experiencing as much as a 50% loss in their tax base (Texas Division of Emergency Management, 2008). At that particular moment in time—after a disaster or flooding event—however bad the destruction, foremost on the community's mind is the ability to remain viable economically. The Association of State Floodplain Managers in a 2006 White Paper reflecting the opinion and experiences of floodplain and mitigation managers nationwide cited this tax loss dilemma as a barrier to buy outs:

Community officials in these situations do not want acquisition projects undertaken because the local tax base will be reduced when the acquired property is placed in open space in perpetuity and there is no new development to compensate for the loss of tax revenue on the acquired parcels. In addition, if enough residents were to relocate, the community could experience a diminished ability to provide adequate public services, be forced to default on financial obligations such as infrastructure investments, or even cease to exist. (ASFPM, 2006, p. 3)

## **H. ANALYSIS AND EVALUATION**

This section analyzes the impacts and projected outcomes associated with implementing proposed buy-out program changes. The projected impacts and outcomes are evaluated against six criteria with quantitative scores assigned to each criterion. A sum total is then presented as a means to evaluate the overall feasibility and impacts associated with implementation.

### **1. Effectiveness: Would Implementing This Provision Reduce Losses from Floods?**

Unequivocally, removing structures from flood-prone areas reduces the impact and costs of flooding. Implementation of this proposal would likely increase the number of structures removed from flood-prone areas because it defers a key factor often cited by comment officials as an impediment to buy-out programs: the associated tax revenue loss a community incurs when a community removes a structure from its tax base.

Scoring: 5 out of 5. This measure would result in substantial increases in flood losses avoided.

### **2. Is There Congressional Support to Enforce This Provision?**

It is anticipated that a good deal of support for this measure exists with little or no opposition. The rationale for this assertion is that it is a win-win for Congressional officials in that the economic burden to their constituent citizens and communities would be reduced.



Scoring: 5 out of 5. It is anticipated that strong Congressional support for this proposal is very likely.

### **3. Legality: What Is Required to Implement This Provision?**

By reviewing the Stafford Act, the author sees no provisions prohibiting implementation of this proposal. Implementation requires a change in FEMA policy to consider the loss of tax revenues as an allowable cost under the HMGP.

Scoring: 5 out of 5. This measure would require FEMA policy changes.

### **4. What Are the Federal Costs to Implement?**

For this evaluation criterion, two factors are examined, impact to the Disaster Relief Fund (DRF) and the federal cost to implement and administer the proposal.

#### ***a. Disaster Relief Fund Costs***

Implementing this proposal would require no increase in the Disaster Relief Fund (DRF) in that the prevailing 15% HMGP cap would remain intact. Essentially, this proposal will result in reducing the number and dollar value of HMGP projects affected as the proposal does not recommend increase the prevailing HMGP cap.

Scoring: 4 out of 5. This measure would not increase DRF outlays.

#### ***b. Federal Implementation and Administration Costs***

With regards to the federal cost to administer, aside from the one-time implementation activities associated with developing and implementing policy changes, no projected increase in the fixed, federal-level effort to administer the HMGP is anticipated.

Scoring: 4 out of 5. This measure would not increase the federal cost to administer the HMGP.

**5. What Is the Burden of Implementation to State and Community Officials?**

Examining the implementation burden to state and local officials' criterion considers two categories: 1) complexity and 2) funding outlays.

*a. Complexity*

Implementing this tax-loss offset proposal is not projected to increase the manpower needed to implement and administer the HMGP for state or community officials. Some minor degree of effort is needed to calculate projected tax loss revenues to determine a grant award, but is expected to be relatively simple to do and not require additional expertise or manpower.

Scoring: 3 out of 5. Effects no material change in program complexity and the manpower or technical expertise needed to administer the program.

*b. Funding Outlays*

As implementation is not expected to require additional more manpower, expertise, or effort, no expected cost is anticipated in the funding needed to implement or administer the proposal.

Scoring: 3 out of 5. Implementation is not projected to change state or community-level funding.

**6. What Are the Social and Cascading Impacts Associated with Implementation?**

The social and cascading impacts appear overwhelmingly positive. Structures are removed from the flood-hazard areas. Flooding will no longer impact that plot of land and the structure that once stood on it, and moreover, the removed structure can no longer harm other structures in the event of strong storm surge situations. The land in question is restored to green or open space. Green space equates to parks and wildlife settings and could translate into green belts in urban settings. The cascading impacts are the social and recreational values of these green spaces and what that might bring to family and

community life. Another social impact might be a greater sense of community and neighborhood security brought by greater certainty that removed structures from flood-prone areas brings.

From a community perspective, the grace period permitted to find alternative sources of revenues to replace that which was lost by removing structures from the flood zone gives the community sufficient time to plan their urban areas adequately in a manner unrushed and not necessarily within the immediate shadow of the disaster that wrought the conditions.

A potential down side is that the fabric of communities could be fragmented, if under a group buy out scenario, only portions of communities are bought out, which may leave remaining structures in scattershot fashion or in blocks. Under this scenario, the whole of community is lost and the fabric of the neighborhood potentially disrupted. The unintended consequences could be social unrest, individual depression and the sense of loss of a community, and negative economic and business impacts.

Scoring: 4 out of 5. Implementation is projected to bring a moderate amount of positive social change and generally positive cascading impacts.

## **I. RECAP OF ANALYSIS**

Table 8 depicts the total scoring after analyzing the projected impacts of implementing the proposal to change the buy-out program. The overall score for implementing this measure is 33 points out of a total of 40 possible points.

Table 8. Evaluation Scoring Results for Changing Buy-Out Provisions

EVALUATION SCORING RESULTS FOR CHANGING BUY-OUT PROVISIONS						
CRITERIA	NUMERICAL SCORE					Score
	Less		↔	More		
	1	2	3	4	5	
Effectiveness	Results in no projected losses avoided	Results in minimal projected losses avoided	Results in moderate projected losses avoided	Results in significant projected losses avoided	Results in substantial projected losses avoided	5
Congressional Support	Highly unlikely	Somewhat unlikely	Equally likely and unlikely	Somewhat likely	Very Likely	5
Legality	Requires significant legislative change	Requires moderate legislative change	Requires minor legislative change	Requires change to code of federal regulations	Requires change to FEMA policy	5
Federal Costs to Implement and Administer	Significant increase in DRF expenditures	Moderate increase in DRF expenditures	Minimal increase in DRF expenditures	No change in DRF expenditures	Results in savings to the DRF	4
	Substantial increase in federal cost to administer	Moderate increase in federal cost to administer	Minimal increase in federal cost to administer	No increase in federal cost to administer	Reduction in federal cost to administer	4
Implementation and Administration Burden to State and Local Stakeholders	Substantially increases complexity	Moderately increases complexity	No change in complexity	Moderately reduces complexity	Significantly reduces complexity	3
	Requires substantial additional funding outlays	Requires moderate additional funding outlays	Requires no change in funding outlays	Moderately reduces funding outlays	Significantly reduces additional funding outlays	3
Social and Cascading Impacts	Results in significant negative social change and cascading impacts	Results in moderate negative social change and cascading impacts	Results in no negative social change and cascading impacts	Results in moderate positive social change and cascading impacts	Results in significant positive social change and cascading impacts	4
<b>SCORE</b>						<b>33 Out of 40</b>

## J. CHAPTER SUMMARY AND CONCLUSION

With regards to flooding, this country generally rewards people living and communities developing in flood-hazard areas by way of subsidized flood insurance and the promise of repeat disaster assistance and repeat reimbursement of flood claims. It is part of an evolving national trend toward a greater federal role in the assumption of disaster cost. In the absence of changing this national role, this chapter has examined ways to develop and refine incentives that might voluntarily induce individuals and communities to take actions to lessen the risk they are undertaking by living in flood-prone areas, either by mitigating in anticipation of future events or by relocating structures and people and out of the floodplain. Given the perceived generosity of federal

disaster assistance in the absence of undertaking these mitigation steps, the reward or incentive unfortunately has to be perceived as significant and outweighing federal disaster assistance. Thus, the incentive proposals presented in this chapter are generous yet remain within the confines of existing disaster aid appropriation practices. The proposals represent this author's opinion for the most feasible and politically acceptable incentive-based solutions to a problem—flooding—in an imperfect environment. Implemented, the evidence provided indicates that the proposals will reduce the impact and costs of flooding.

The next chapter introduces and analyses the third and final policy option of this thesis.

## **VII. POLICY OPTION THREE—BOTTOM-UP REVIEW**

A sustainable community selects mitigation strategies that evolve from full participation among all public and private stakeholders. The participatory process itself may be as important as the outcome.

— (Mileti, 1999, p. 6)

### **A. INTRODUCTION**

This chapter seeks to address the following research question: Are there changes to how FEMA administers mitigation elements of the Stafford Act that would streamline the program and increase the likelihood of state and local buy in of mitigation efforts toward an end of reducing the future impact and costs of disasters? The proposal responding to this question involves conducting a bottom up review of the Stafford Act’s mitigation elements with an emphasis on broad and deep stakeholder engagement in the process. For the purpose of this chapter, the author defines a bottom-up review as stepping back and looking at Stafford Act-based mitigation anew with extensive engagement of state and local officials; state and local emergency management and mitigation practitioners; and a wide array of stakeholders.

This chapter is structured by providing insight into the status quo, i.e., the current situation, followed by the details of the proposal, as well as an analysis of the proposal using the six criteria identified in the methodology chapter of this thesis. The author concludes the chapter with a summary and observations.

### **B. OVERVIEW OF THE CURRENT SITUATION**

A common theme by emergency management and hazard mitigation practitioners is discontent with what they view as the bureaucracy and complexity of the Stafford Act, to include the mitigation provisions. As discussed in earlier chapters, numerous organizations representing mitigation officials; municipal, county, and state emergency management officials; and floodplain managers have raised their concerns often to Congress and the President. Critics argue that their issue is not with how the program is

structured necessarily, but with how they perceive that FEMA has interpreted and administered the basic Stafford Act and the consistency of those interpretations and administration. Generally, the prevailing concerns are that the Act, to include the mitigation components, has been interpreted and applied narrowly and not with a view to recovery efforts or broader concepts of mitigation.

A recurring theme in the community is that streamlining the program and reducing the red tape is necessary and not doing so impedes effective mitigation efforts. To that end, in testimony before Congress in 2001, The American Association of Floodplain Managers asked Congress to shorten post-disaster recovery and mitigation processes and make them more effective, adding that how Congress approaches this request has cost consequences for the nation (Berginnis, 2011). Also of concern is that the bureaucracy and complexity inherent in the program has shifted emphasis from the application of common sense and intuition to a focus on processes (NEMA, 2009). This focus on process undoubtedly strains the already scarce resources for implementing the HMGP at the local level. Indeed, as earlier chapters outlined, as effecting HMGP grants requires state and local officials to acquire specialized knowledge of FEMA rules, as well as specialized skills in administering the program using FEMA-specific software applications. Similarly, concern also exists that the current approach to mitigation grants—and Homeland Security grants in general—are disjointed and “encourages buying “things” “rather than investing to build core capabilities” (NEMA, 2011, p. 1).

A more recent development surrounds what some view as the marginalization of mitigation. Two schools of thought on this subject exist, one is that within the context of folding FEMA into DHS, the role of natural hazards—and thus mitigation—has been relegated to second-class status in favor of terrorism pursuits (Bullock, Haddow, & Coppola, 2005). In Congressional hearings in 2006, NEMA Representative Tamara Little argued:

On a policy front, mitigation has been marginalized. While the Department of Homeland Security was formed and terrorism became a greater focus, mitigation activities received less focus. The life cycle of emergency management was broken when preparedness was moved from FEMA to create a new preparedness directorate within DHS in 2005.... (Little, 2006)

NEMA's concerns are not dated. As recently as October 2011, an emergency management official similarly opined: "The Federal Emergency Management Agency (FEMA) still hasn't found its feet since being placed in the Department of Homeland Security (DHS), instead of being a cabinet level office" (Homeland Security News Wire, para. 3).

The other school of thought is that in the interest of saving Disaster Relief Fund costs by closing disaster field offices quickly and minimizing field work, some mitigation work is not being done, and more broadly, as a discipline, mitigation is being overlooked. ASFPM's comments on FEMA's internal bottom up review of its Public Assistance program illustrate the frustration, whereby members report that mitigation activities are becoming limited, and "check-the-box" consideration only. ASFPM argues as follows:

First, all Joint Field Office Federal Coordinating Officer's (FCO) must balance their mission of closing down Joint Field Offices (JFOs) as soon as possible with the sometimes longer and more labor intensive task of ensuring implementation of §406 mitigation where appropriate for every project worksheets (PWs) in every disaster. Too often, we hear about instances where §406 mitigation is simply unimportant to the FCO and —gets in the way.... (ASFPM, 2011, para. 7)

Lastly, a federal-to-state framework for administering the Stafford Act's HMGP characterizes the current situation, which begs the question: Would greater buy in and ownership of hazard mitigation activities and responsibilities increase if this hierarchy were changed? Currently, the HMGP is administered at the federal level by way of 10 regional FEMA offices that act in concert with the FEMA HQs Mitigation Directorate. FEMA works directly with the applicant—the individual state—to administer the program,<sup>5</sup> which arguably creates a "push" vs. "pull" (NEMA, 2009) scenario with

---

<sup>5</sup> FEMA also works directly with tribes.



federal officials playing a significant oversight role in reviewing and approving or denying grant applications, approving management and budget plans, and reviewing technical and engineering project specifications. It could be argued that this might provide the conditions for engendering diminished sense of program ownership by states, and in turn, community officials and citizens.

As discussed in detail in Chapter III, a contrary view to those who criticize mitigation and Stafford Act bureaucracy and red tape does exist. Thus, what practitioners and emergency management officials may view as bureaucracy and red tape in FEMA Stafford Act activities, FEMA and others may consider as FEMA's responsibility to use taxpayer dollars judiciously (disaster relief funds) and to comply with applicable laws and regulations that codify the law.

Another view is that what critics argue as bureaucracy and complexity is FEMA's demonstration of its role as a federal agency to be accountable to the people and taxpayers it serves. The Honorable Jocelyne Bourgon, President Emeritus of the Canada School of Public Service, defines the classical public administration model's employees—such as those employed by FEMA—as having first and foremost concern and regard for the rule of law and deploying integrity, probity and impartiality (Bourgon, 2007).

In conclusion, the current situation reflects complex and broad issues with no one easy answer. This author maintains that attempting to address the issues surrounding bureaucracy, marginalization of mitigation, and sense of state and local ownership is best done by a broad, all-encompassing bottom-up review of the mitigation provisions of the Stafford Act, and in doing so, conducting a national dialogue on mitigation. The proposal that follows builds on a 2009 NEMA paper entitled, "Recommendations for an Effective National Mitigation Effort."

**C. PROPOSAL. CONDUCT A COMPREHENSIVE AND ALL-INCLUSIVE BOTTOM-UP REVIEW OF THE STAFFORD ACT'S MITIGATION ELEMENTS**

The proposal is straightforward, conduct a bottom-up review of the Stafford Act's mitigation elements and within the framework of a nation-wide dialogue on mitigation. Key elements of the review include the following.

**1. Creating a National Mitigation Collaborative Consortium (NEMA, 2009)**

What is key is who leads the bottom-up review. Ideally, the review should be developed and conducted by those responsible for providing the protection and safety of the nation's citizens; in other words, by state, community, city and tribal officials. As the mitigation community has asked for the ability to take a stronger role in the management of the collective mitigation programs (FEMA Reauthorization: Cutting Red Tape in Recovery, 2011), this role might provide an incentive for increased participation in the effort. This approach builds ownership and buys in, and more importantly, brings to the table the knowledge of those closest to the mitigation and risk-based problems that must be addressed; the context and constraints surrounding the problems, and importantly, the creativity and innovation of a broad array of stakeholders. Burby, in his 2003 article, *Making Plans that Matter: Citizen Involvement and Government Action*, outlines the numerous studies throughout the years that demonstrate the nexus between stakeholder involvement in planning and concept development processes, such as the Consortium would undertake. Equally as important, the consortium should include not only those who must implement what is eventually proposed but those who bear the first, second, and third order impacts of what is proposed, e.g., citizen groups, chambers of commerce, building associations, and land development interests (NEMA, 2009). By gaining potential opposition elements at the onset, the likelihood of understanding and incorporating differing viewpoints is possible (NEMA, 2009).

Developing the creation of and leading the consortium should be done by an entity with credible influence in the mitigation and emergency management community, for example, NEMA or ASFPM. While federal participation in the consortium is

necessary, designating a non-federal entity to create and lead the consortium helps to ensure that potential federal influence and bias is limited and is also likely to encourage state and local buy in and the perception as a truly different and non-traditional approach.

## **2. Funding the Consortium**

Funding for this effort would be realized by diverting existing funds from the Stafford Act's Pre-Disaster Mitigation (PDM) Program, as well as a small percentage of funds from the proceeds of flood insurance premiums receipts from the National Flood Insurance Program.

The PDM program, which is funded annually by Congress, is an appropriate source of funding for this effort in that its goals parallel that of the consortium. The goal of the PDM is to provide, "Technical and financial assistance to States and local governments to assist in the implementation of predisaster hazard mitigation measures that are cost-effective and are designed to reduce injuries, loss of life, and damage and destruction of property..." (Disaster Mitigation Act of 2000, 2000).

The NFIP is identified as a funding source in that one of the goals of the program is to reduce the costs of flooding events. In that a majority of the nation's disasters is flood related, it would appear judicious that a portion of the proceeds of the NFIP would be dedicated to flood mitigation efforts of this nature.

## **3. Empowering the Consortium**

The consortium's initial charter should be to conduct a bottom-up review of the Stafford Act's mitigation elements within a zero-sum environment; in other words, no increase in federal expenditures<sup>6</sup> is permitted; however, shifting of existing federal resources is permitted. The consortium should be charged with providing consensus recommendations on achieving the following objectives.

---

<sup>6</sup> It is assumed that Congress continues to appropriate Disaster Relief Fund (DRF) funds on an as-needed basis and within the current parameters.

1. Creating greater buy in of mitigation activities at the state and local level; in other words, those who administer the program
2. Creating greater grass roots participation in mitigation activities
3. Increasing the effectiveness of the Stafford Act's mitigation programs
4. Reducing federal disaster assistance costs by way of mitigation
5. Determining the optimal federal vs. state and local mix in administering Stafford Act mitigation programs while maintaining the integrity of mitigation principles and judicial use of taxpayer dollars
6. Determining if the consortium should be a one-time effort to address the objectives identified above or if it should be a continuing effort, and if so, what would its objectives be and how would it be funded in a zero-sum budget environment

#### **D. ANALYSIS AND EVALUATION**

The analysis and evaluation of this proposal centers on the implementation of the proposal (the consortium), without conjecture on what the consortium might produce after implementation. With this proviso in mind, the projected impacts and outcomes of this proposal are evaluated quantitatively and qualitatively against six criteria with numerical scores assigned to each criterion. A sum total is then presented as a means to consider the overall feasibility and impacts associated with implementation.

##### **1. Would Implementing This Provision Reduce Losses from Floods?**

As this proposal involves only implementing a dialogue on mitigation, no projected flood losses avoided.

Scoring: 1 of 5. No projected flood-related losses avoided associated with the initial implementation of this proposal.

##### **2. Is There Congressional Support to Enforce This Provision?**

It is anticipated that Congressional leaders would support the measure in that it has the potential of redirecting greater power and control of administration of mitigation grant programs that yield millions of dollars annually from federal to state and local domain.

However, Congressional pushback may arise in the nature of the consortium's funding source. The PDM program involves the competitive awarding of mitigation grant projects at the federal level through FEMA, but in recent years, these projects have become Congressional earmarks subject to political influences (McCarthy & Keegan, 2009). Thus, possible political pushback may be anticipated. The degree of pushback would likely be equal to the amount of funding that Congressional members perceive being diverted from their ability to earmark.

Scoring: 4.5 out of 5. Congress is somewhat likely to support this measure.

### **3. Legality: What Is Required to Implement This Provision?**

Establishing the consortium requires no legislative, policy, or program changes. On its most basic level, the consortium is an advisory body the likes of which FEMA has employed throughout its history.

Score: 5 out of 5. No regulations, laws, or significant policy changes to implement this proposal are anticipated.

### **4. What Are the Federal Costs to Implement?**

For this evaluation criterion, two factors are examined, impact to the Disaster Relief Fund (DRF) and the federal cost to implement and administer the proposal.

#### ***a. Disaster Relief Fund Costs***

Initially, no increases in disaster relief funds or other government expenditures are projected in that the framework for the consortium requires it to consider actions in a zero-sum funding environment, with no net initial increase in federal expenditures.

Scoring: 4 out of 5. No projected initial increase in DRF allocations under this proposal are anticipated.

***b. Federal Implementation and Administration Costs***

A minimal cost for FEMA to implement this proposal is anticipated in that the bulk of the lift is done by other, non-federal entities. Thus, an independent non-federal entity, such as NEMA or ASFPM, would be charged with standing up the consortium and conducting its proceedings. FEMA's role would be limited to partnering as consortium subject-matter experts and advisors.

The federal costs at the implementation and start up stage involve diverting funding from the Pre-Disaster Mitigation Fund and the NFIP, which does not increase net federal expenditures; rather, it shifts from one venue to another.

Scoring: 4 out of 5. No anticipated initial increase in federal administration and mid-to long term increased federal costs are projected to be offset by federal savings.

**5. What Is the Burden of Implementation to State and Community Officials?**

This evaluation criterion reviews the overall burden to implementing jurisdictions. Examining the implementation burden to state and local officials considers two categories: 1) complexity, and 2) funding outlays.

***a. Complexity***

It is anticipated that the burden to state and local stakeholders would be minimal in that an external agency, such as NEMA or ASFPM, would be charged with establishing and implementing the consortium, and thus, no impact to state and local stakeholders.

Scoring: 3 out of 5: It is expected that the establishment and implementation of the consortium will not change the complexity of existing programs with state and local stakeholders.

*b. Funding Outlays*

As the program is set up for implementation in a zero-sum funding framework at the federal level, the proposal is not anticipated to change funding requirements materially for state and local stakeholders.

Scoring: 3 out of 5: It is projected that the implementation of the consortium would not change funding requirements.

**6. What Are the Social and Cascading Impacts Associated with Implementation?**

The proposal is designed to have far-reaching social and cascading impacts. The objectives the consortium is charged with addressing speak to starting a new grass roots dialogue about mitigation activities under the umbrella of the Stafford Act and with a view to the fact that flooding is considered that nation's most ubiquitous natural hazard (Kick et al., 2011). The consortium is essentially tasked with taking a fresh look at the mitigation paradigm and readjusting it toward an end of reducing the impact and costs of disasters, engaging more depth and breadth of stakeholder buy in, and increasing the effectiveness of the entire mitigation effort. To the degree that the consortium is successful in its charter is the degree to which social and cascading impacts will be realized. Assuming the consortium is moderately successfully, the greatest social benefit arising from the projected success of the consortium is the heightened engagement of all stakeholders—community officials, as well as the public. Embedded in this engagement is the notion that communities and citizens will be more aware of the hazards indigenous to their community and armed with this knowledge, be in a better position to act to address collectively and individually.

The reader may question why greater grass roots and community involvement is important. At the most fundamental level, it is important because public involvement is a foundation of a democracy: A nation's laws and policies are developed and promulgated by way of the active involvement of its citizens (Kunreuther, 2008). More specifically, and for the purpose of this thesis—reducing the costs and impacts of flooding through mitigation activities—citizen engagement is important because involved citizens are

typically informed citizens. Informed citizens in this context know the flood risks and other hazards they face, which may seem elementary and obvious, but a recent FEMA survey conducted under the auspices of the Office of Management and Budget, revealed startling results about community and individual knowledge of flood risk in particular. In communities where 68% of community officials reported that their community was believed to be at risk for flooding, only 31% of respondents [individuals] reported believing that their community was at risk of flooding (FEMA, 2011g).

Engendering more community and individual engagement in flood and other mitigation activities is more than about informed communities. It is about creating states, communities and individuals not just knowledgeable about the flood risks they face, it is also about creating a sense of empowerment and a having citizens be passionate about doing something to reduce that risk.

Aside from community and grass roots engagement, the issue of state and community official buy in and ownership of the risks and mitigation strategies in their respective jurisdiction is also pertinent. As discussed earlier in this thesis, the hierarchy of the federal to state to community model for effecting mitigation programs under the Stafford Act is likely less than suboptimal in that it does not lend to engendering as sense of ownership at the state and local levels, which creates a sense—particularly at the local level—that community officials are merely implementing yet another federal program. What would be more effective is if the communities felt they were implementing “their” programs. Should the consortium be successful in redefining a more optimal mix to the current diffusion of responsibility, a greater sense of ownership and responsibility at the community level in particular is anticipated.

Scoring: 5 out of 5. It is projected that implementing the bottom-up review will have positive and far-reaching social and cascading impacts.

## **E. RECAP OF ANALYSIS**

Table 9 depicts the total scoring after analyzing the projected impacts of implementing the bottom-up review proposals. The overall score for implementing this measure is 29.5 points out of a total of 40 possible points.



Table 9. Evaluation Scoring Results for Bottom-Up Review.

EVALUATION SCORING RESULTS FOR BOTTOM-UP REVIEW						
CRITERIA	NUMERICAL SCORE					Score
	Less		3	More		
	1	2		4	5	
Effectiveness	Results in no projected losses avoided	Results in minimal projected losses avoided	Results in moderate projected losses avoided	Results in significant projected losses avoided	Results in substantial projected losses avoided	1
Congressional Support	Highly unlikely	Somewhat unlikely	Equally likely and unlikely	Somewhat likely	Very Likely	4.5
Legality	Requires significant legislative change	Requires moderate legislative change	Requires minor legislative change	Requires change to code of federal regulations	Requires change to FEMA policy	5
Federal Costs to Implement and Administer	Significant increase in DRF expenditures	Moderate increase in DRF expenditures	Minimal increase in DRF expenditures	No change in DRF expenditures	Results in savings to the DRF	4
	Substantial increase in federal cost to administer	Moderate increase in federal cost to administer	Minimal increase in federal cost to administer	No increase in federal cost to administer	Reduction in federal cost to administer	4
Implementation and Administration Burden to State and Local Stakeholders	Substantially increases complexity	Moderately increases complexity	No change in complexity	Moderately reduces complexity	Significantly reduces complexity	3
	Requires substantial additional funding outlays	Requires moderate additional funding outlays	Requires no change in funding outlays	Moderately reduces funding outlays	Significantly reduces additional funding outlays	3
Social and Cascading Impacts	Results in significant negative social change and cascading impacts	Results in moderate negative social change and cascading impacts	Results in no negative social change and cascading impacts	Results in moderate positive social change and cascading impacts	Results in significant positive social change and cascading impacts	5
<b>SCORE</b>						<b>29.5 out of 40</b>

## F. CONCLUSION

Attempting to apply a stick to enforce mitigation (policy option one) or expanding upon incentives to encourage mitigation (policy option two) are arguably only band-aid solutions treating the symptoms and not the underlying causes. The underlying cause of why widespread impact and steep costs associated with flooding occurs is that people and communities are either not aware of the magnitude of the risk, they are not aware of the impacts but not taking action to reduce that risk, and—or—they do not care. Conducting a bottom-up review and initiating a nation-wide dialogue on mitigating natural hazard risks is the proposed antidote to treating this lack of knowledge, concern, or inaction.

The bottom-up review proposal is crafted in a way most likely to generate grass-roots awareness of and impacts associated with indigenous risks, to engender ownership of the consequences of these risks and the need to do something about them—mitigate or eliminate, and to raise awareness of the tools available to mitigate these risks. At the state level, it is crafted to result in empowering states to gain greater control over the tools in their mitigation toolbox (Association of State Floodplain Managers, 2006), and in doing so, creating a greater sense of ownership of the programs for mitigating risk. The primary tool is the mitigation programs found under the Stafford Act but with the work of the consortium, could easily spill into the preparedness arena. Implemented as prescribed, the consortium and its efforts have the capacity to reduce the impact and costs of not only flooding, but other natural hazard risks as well.

The next and final chapter ties together the findings of this thesis, makes recommendations on implementation of the policy options, and identifies additional research areas.

THIS PAGE INTENTIONALLY LEFT BLANK

## VIII. CONCLUSION AND RECOMMENDATIONS

Those who cannot remember the past are condemned to repeat it.

— George Santayana (Santayana, 1905/1998)

### A. LOOKING BACK—WHAT HAS BEEN COVERED

This thesis has examined the magnitude of the impact and costs of flooding in this country. The statistics are telling. Nationally, flood costs have increased in the first decade of this century from \$6 billion to \$15 billion dollars (New York State Floodplain and Stormwater Managers Association, 2010). The amount of damages is arguably attributable to where people live—currently, over 53% of the population lives in a coastal county (Hodge, 2008), which is projected to increase by as much as 75% (McMillan, 2007). Exacerbating this demographic trend are estimates that precipitation has increased and will continue to do so. The U.S. Climate Change Science Program estimates that in the future, precipitation events that have historically occurred every 20 years will occur every four to six years (Karl et al., 2009). These two factors—demographics and precipitation changes—have converged to create the perfect storm. The toll the perfect storm exacts are lives lost; economic losses to individuals, business, and communities; and a drain on the national Treasury and to U.S. taxpayers. This toll impacts the homeland security posture by way of diversion of resources from other homeland security concerns, and because communities form the core capabilities of the nation with respect to responding to catastrophic events (Clarke & Chenoweth, 2006)—be they terrorist, manmade, or natural hazards—the toll of flooding and its impact on communities impacts the homeland security posture of this nation.

Next, the reader was informed about the primary national policy to address the impact and costs of flooding, the National Flood Insurance Program. The framers of the NFIP sought to reduce the impact of flooding on individuals, to reduce flood-related disasters costs, and to steer land use decisions away from flood-prone areas. Chapter II walked the reader through an in-depth analysis of how and why, overall, the program has not been effective toward reaching its stated goals. On the contrary, inflation-adjusted

flood losses have increased fivefold from the 1940s to the 1990s (Pielke & Downton, 2000). By walking through the history of the NFIP, the reader gained insight into the author's analysis and conclusion that the program likely cannot be effectively reformed as the same forces that negated many reforms in the past—political, economic, and societal—still exist today. While the program has significant flaws, success stories exist, notably the Community Rating System, which studies (Zahran et al., 2010) have demonstrated serve as a powerful incentive to act to reduce the risk of flooding. The NFIP also has a strong flood risk identification program, which recently updated a majority of the nation's flood maps. These maps are the source of identification of flood risk for a community, and in the words of FEMA flood risk spokesman, Jose deBerge, “When home and business-owners know and understand their risk, they are more likely to take steps to reduce their risk” (Associated Press, 2010).

Chapter III oriented the viewer to another national policy venue with the capacity to influence the impact and costs of flooding. The Robert T Stafford Act is the policy that outlines how the federal government responds to disasters within the United States. The Act influences the impact and cost of flooding by way of providing incentives to communities and individuals to undertake mitigation measures; by limiting and enforcing federal disaster assistance when certain mitigation and NFIP measures are absent; and by mandating and enforcing specifics on post-disaster structural reconstruction and repairs. Although lacking much of the core structural weakness of the NFIP, the author outlined how areas within the Stafford Act, if better optimized or changed, could potentially reduce the impact and costs of flooding. These provisions include the Hazard Mitigation Grant (HMG) program. Also analyzed was what many critics perceived as the Act's bureaucracy and how the Act has been interpreted along with the federal-centric delivery of the Act. Countering arguments to the claims of bureaucracy were also examined.

In Chapter IV, the reader was oriented to the methodology and criteria used to evaluate upcoming policy options. The criteria weighed effectiveness, political, and legal factors along with impact to federal and state and local stakeholders. Lastly, the criteria were outlined that examine social and cascading impacts of a proposed policy.

Policy option one—enforcement of provisions of the Stafford Act—was analyzed in Chapter V and sought to answer the research question: Would changes to enforcement provisions of the Stafford Act reduce the impact and costs of flooding? The chapter centered on analyzing the Stafford Act’s three-strike rule, a provision that diminishes Public Assistance funding if a property was damaged on more than one occasion within the preceding 10-year period by the same type of event and the owner of the property has not taken appropriate measures to mitigate against the hazard that caused the damage.

Chapter VI presented policy option two, which sought to answer the research question: Would changes to incentive provisions of the Stafford Act reduce the impact and costs of flooding? Two options were presented, one policy involved increasing the federal share of the Stafford Act’s Hazard Mitigation Grant Program (HMGP), and the second policy involved expanding grant flexibility to reimburse communities temporarily for projected tax revenues lost as a result of undertaking the Act’s structural buy-out program. The author acknowledged that these proposed increases in federal outlays for sub national governments were part of a larger question surrounding fiscal federalism—who pays for disaster relief and what should be the role of the federal government in providing that relief.

Chapter VII presented the thesis’ final policy proposal by conducting a bottom-up review of the Stafford Act’s mitigation elements and to answer the research question: Are there changes to how FEMA administers mitigation elements of the Stafford Act that would streamline the program and increase the likelihood of state and local buy in of mitigation efforts toward an end of reducing the future impact and costs of disasters? The proposal involved conducting a bottom up review of the Stafford Act’s mitigation elements with an emphasis on broad and deep stakeholder engagement in the process—beginning a national dialogue on mitigation by way of the establishment of a National Mitigation Collaborative Consortium. The basis for the review is what critics perceive as the bureaucracy and complexity of the Stafford Act, to include its mitigation provisions, as well as the federal-to-state framework for administering the HMGP, both administered by FEMA. The reader was presented with an alternative view in that in light of the

agency's post-Katrina criticism and scrutiny, it might be viewed that the agency is simply trying to correct—by way of its policies and practices—what government and other reports decried as lax or rigid.

The current and final chapter continues to recap the findings of the analysis conducted for each of the three policy options, make recommendations for which options should be considered for implementation, identify areas of further research, and conclude the thesis.

## **B. RECAP OF FINDINGS AND PRESENTATION OF RECOMMENDATIONS**

The reader will recall that the policy options centered on enforcement provisions of the Stafford Act, increasing incentives under the Act's HMGP, and conducting a bottom-up review of the Act's mitigation elements. In this section, the findings from the analysis of each option are recapped and a recommendation made on whether to recommend implementation of each option. As a backdrop to this discussion, the reader is referred to Table 7, which presents an overview of how each of the options fared when weighed against each of the criterion. Higher scores denote a more desired result, for example, a score of five for the cost effectiveness criterion denotes that substantial losses from flooding will be avoided whereas a score of one denotes no projected losses avoided.

Table 10. Evaluation Scoring Results for All Policy Options

<b>EVALUATION SCORING RESULTS FOR ALL POLICY OPTIONS</b>				
<b>CRITERIA</b>	<b>POLICY OPTION 1: 3-Strike Rule</b>	<b>POLICY OPTION 2: HMG Match</b>	<b>POLICY OPTION 2: Reimburse for Tax Revenue Loss</b>	<b>POLICY OPTION 3: Bottom-Up Review</b>
Effectiveness (Projected losses avoided)	5	5	5	1
Congressional Support	1.5	1.5	5	4.5
Legality	4	4	5	5
Federal Costs to Implement and Administer (DRF expenditures and federal cost to administer, respectively)	3	3	4	4
	4	4	4	4
Implementation and Administration Burden to State and Local Stakeholders (How complicated and funding outlays, respectively)	2	2	3	3
	2.5	2.5	3	3
Social and Cascading Impacts	2.5	2.5	4	5
<b>SCORE (out of 40 available points)</b>	<b>24.5</b>	<b>24.5</b>	<b>33</b>	<b>29.5</b>

**1. Policy Option Two, Reimbursement for Tax Revenue Losses**

From a numerical comparison, one policy option stands out against the others in terms of receiving the highest score (33 out of 40), modifying the HMGP to allow for offsetting projected tax revenue losses associated with the Stafford Act’s property buy-out program whereby structures are removed or relocated from flood-hazard areas.



Where the program is implemented, it works well, with FEMA reporting that over 20,000 properties have been bought out under this program since 1993 (FEMA, 2010c). Reports a mayor involved in the program, “We are seeing that it pays to break the repetitive cycle of flooding and rebuilding (Gazette Staff, 2010). The underlying premise of this option is that the projected revenue losses associated with removing properties from a flood-hazard area may serve as a disincentive for community and individual participation in this program. Opined the Association of State Floodplain Managers (2006, p. 3):

Community officials in these situations do not want acquisition projects undertaken because the local tax base will be reduced when the acquired property is placed in open space in perpetuity and there is no new development to compensate for the loss of tax revenue on the acquired parcels.

This proposal fared well and ahead of the others because it has the potential to result in substantial flood losses avoided, does not increase federal expenditures, does not require change of law, would engender political support, and eases the financial tax loss burden on communities seeking to remove properties permanently from flood-hazard areas. The only potential drawback to this option is the cascading and social impacts. Should a community’s buy-out program result in blighted neighborhoods or loss of community internal structure, e.g., buying out some homes as opposed to all homes in a sector or community. However, it could be argued that most communities would recognize this possibility in advance and likely not undertake measures that undermine the viability of neighborhoods.

Recommendation: Given the potential this option provides to reduce the impact and costs of flooding and with very limited potential drawbacks, this author recommends this proposal be considered for implementation by FEMA, the sponsoring agency for the HMGP.

## **2. Policy Option Three, Bottom-Up Review**

The policy option with the second-highest numerical ranking is the bottom-up review, or conducting a comprehensive, stakeholder-based all-inclusive review of the

Stafford Act's mitigation elements. This option scored 29.5 out of 40 points and was arguably disadvantaged from a scoring perspective in contrast to the other options because the option analysis examined the initial framework of conducting the review without examining or conjecturing on what the results of the review might be. That aside, the analysis of this option provided no significant negative outcomes, no significant increase in federal or local costs or burdens, and presented no legal or significant political challenges to implementation. What separates this option from the others is its *potential*. The reader will recall that this option draws upon a 2009 NEMA paper entitled "Recommendations for an Effective National Mitigation Effort" (NEMA, 2009) and establishes, funds, and empowers a national mitigation collaborative consortium. The policy option charges this consortium with providing consensus recommendations on achieving the objectives listed below, with an anticipation of creating greater buy in of mitigation activities at the state and local level; in other words, those who administer the program. This buy in is key. The National Research Council (NRC) in its 1996 book, *Understanding Risk*, strongly encouraged broad and grass roots support in the risk identification process urging collaboration and involvement of "the perspectives and knowledge of the spectrum of interested and affected parties from the earliest phases of the effort to understand the risks" (NRC, 1996, p. 3).

- Creating greater grass roots participation in mitigation activities
- Increasing the effectiveness of the Stafford Act's mitigation programs
- Reducing federal disaster assistance costs by way of mitigation
- Determining the optimal federal vs. state and local mix in administering Stafford Act mitigation programs while maintaining the integrity of mitigation principles and judicial use of taxpayer dollars
- Determining if the consortium should be a one-time effort to address the objectives identified above or if it should be a continuing effort, and if so, what would its objectives be and how would it be funded in a zero-sum budget environment

The consensus answers to these objectives have the potential for wide and far-reaching impact on resetting the clock on mitigation activities and their effectiveness nationally with an end result of a significant potential to reduce the impact and costs of flooding.

Recommendation: Given the potential this option provides to reduce the impact and costs of flooding and with very limited potential drawbacks, this author recommends this proposal be considered for implementation by FEMA, the sponsoring agency for the Stafford Act.

### **3. Policy Option Two, Hazard Mitigation Program (HMG) Program Match**

The policy option with the third-highest score (24.5 out of 40 points) proposes reducing the non-federal share of the HMGP from 25% to 10% without increasing federal outlays by way of Disaster Relief Fund (DRF) appropriations. This option has the potential to reduce future flood losses moderately in that as the analysis of this option reveals, the research clearly indicates the affordability of this cost share by communities, states, and individuals as a potential barrier to undertaking mitigation activities. A comprehensive 2006 study of repetitive flood loss property owners found that the availability of funding to meet the non-federal share was the key determinant in individual participation in mitigation efforts (Fraser et al., 2006). In addition to the potential to removing this inhibitor, key benefits of the proposal include no significant increase in resource requirements at either the state or federal level, and quite likely, Congressional support of the proposal.

Even with Congressional support, however, legislative changes would need to be made to the Stafford Act to implement the Act, not always an easy feat. Other countering aspects of the proposal include the fact that in a zero-sum framework, if DRF appropriations are increased, then the amount of number of mitigations undertaken will be reduced. Thus, while the non-federal cost share is reduced, the number and amount of properties mitigated is reduced as well.

Recommendation: This author acknowledges that the proposal touches upon much larger questions and issues surrounding the role of government in that “The cost-shares are reflective of the Stafford Act’s fundamental insistence on state participation....” (McCarthy, 2010, p. 2). The unanswered question is does altering this

balance change state and local community commitment and buy in of mitigation activities through reduced funding participation? For this reason, the author recommends this proposal be further researched and not implemented at this time.

#### **4. Policy Option One, The Three-Strike Rule**

Policy Option One, concerning an enforcement aspect of the Stafford Act, weighed in with the lowest score of 24.5 out of a total of 40 points. Recommending codification of an existing, but as of yet implemented provision of the Stafford Act, this policy option recommends decreasing Stafford Act Public Assistance if a property were damaged on more than one occasion within the preceding 10-year period by the same type of event and the owner of the property has not taken appropriate measures to mitigate against the hazard that caused the damage.

This option has the potential to substantially increase the avoidance of flood losses because it will force mitigation activity. As researched in the initial analysis of this option, repeat losses for the same type of event will no longer be financed for repair or reconstruction under the Stafford Act, and such, this would likely serve to influence an increase in mitigation activities as communities and states anticipate the financial consequences of failing to mitigate—a loss of federal disaster assistance. In addition, requiring this mitigation would be effective in that research has shown that for every dollar spent on mitigation activities, four dollars is avoided in future losses (National Institute of Building Sciences, 2010).

This potential for reducing flood losses under this option is countered, however, by political fallout and economic ramifications. The reader observed in the NFIP analysis and discussions of this thesis that economic and political forces throughout its history precluded the introduction and sustainment of true risk-based premiums and enforcement of floodplain management requirements. It could be argued that these same forces would apply to the three-strike rule. However, the author notes that where the NFIP focuses on individual economic burden, the three-strike rule lands on communities and their officials, the owners of public infrastructure, roads, hospitals, and utilities. Also, in the wake of the economic difficulties the national economy finds itself, the time may be ripe

for introducing the notion that the failure of community officials to act in flood-hazard areas need not be imposed on the nation at large, notably those outside the disaster stricken region (Wildasin, 2008), and particularly, in light of the fact that annual public assistance payouts for public infrastructure repair or reconstruction have averaged \$3.3 billion per year (Ingram, 2011).

Indications are that the political tide may be changing. In testimony before Congress in 2010, a member of the U.S. Conference of Mayors Stafford Act Reform Task argued, “A stronger emphasis on hazard mitigation prior to a disastrous event occurring needs to take place. The federal government needs to hold states and localities responsible as it pertains to mitigation” (Enos, 2008). Whether this type of sentiment will translate into feasibility for implementing this proposal is not easy to predict given the dynamic political and societal factors involved. As Waugh and Streib argue, “Disaster mitigation, preparedness, response, and recovery are the end products of complex political and administrative interactions, and the results cannot be easily controlled or anticipated (Waugh & Streib, 2006, p. 137).

Recommendation: This author recommends that FEMA implement this option because it has been demonstrated that when undertaken, mitigation works and the current economic, political, and societal climate may be ripe for requiring communities to insure—by way of mitigation—future flood impacts and costs.

### **C. RESEARCH LIMITATIONS AND AREAS WARRANTING FURTHER RESEARCH**

The hypothesis of this thesis centers around what changes to national policy would influence a reduction in the impact and costs of flooding. The two policies examined were the National Flood Insurance Program and the Stafford Act. The author found an extensive amount of research and studies involving changes to the NFIP with the potential to influence the impact and cost of floods, as well as literature (although somewhat dated) that addresses the role of mitigation (typically funded under the Stafford Act’s HMGP) that addresses flood impacts and costs. What the author found missing is a comprehensive examination of the balance between full mitigation subsidies—the cost

share formula in the HMGP—and partial subsidies. Thus, what is the trade off in community buy in and commitment if the federal government provides 100% of the funding for mitigation projects or 90% or, 75 percent? How does requiring states and local communities to have a fiscal stake in federally funded mitigation measures impact the end result—more mitigation activities undertaken? If this non-federal stake is deemed necessary, what is the right balance to optimize a commitment and demonstrated execution of mitigation activities? The lack of answers to these questions resulted in the author not recommending altering the current non-federal share formula for the HMGP as it is unclear what the impact in increasing federal subsidies has on influencing mitigation behavior. This questions falls under the umbrella of the role of government in indemnifying individuals and communities for disaster assistance and again the question warranting further research is, what is the right balance between federal disaster assistance funding and individual or community funding for same and what balance might engender individuals and communities to develop and maintain a heightened sense of responsibility for their own risk?

#### **D. CONCLUSION: POSSIBLE SOLUTIONS FOR THE PERFECT STORM**

Flooding matters. As the nation’s most common natural hazard, it costs this nation economically, causes death, and renders communities and extrapolated—the nation—to be less than fully postured for other homeland security threats. It will not get better. Demographics leading to more people living in flood-hazard areas and forecasted increases in precipitation are converging to create the perfect storm.

Traditionally, efforts to reduce the impact and costs of floods have been done under the umbrella of the National Flood Insurance Program. This thesis demonstrated the inherent weaknesses of the NFIP and its ineffectiveness in reducing disaster costs and steering land-use decisions out of flood-prone areas. This thesis has also shown how political, economic, and societal factors serve to make effectively reforming the NFIP less than likely. Changing key provisions of the Stafford Act were presented for consideration for accomplishing what the NFIP has and likely cannot accomplish, which is reducing the impact and costs of flooding. The analysis demonstrated that three of the

Stafford Act proposals warrant consideration for implementation and one warranted further research. If implemented, each of these three proposals has the potential to affect lives lost, the nation's homeland security posture and economic position, and each taxpayer's pocketbook by reducing the impact and costs of flooding in the wake of the perfect storm.

## LIST OF REFERENCES

- 15 mayors who must shred the budget to save their bankrupt cities.* (2011). Retrieved from BusinessInsider.com website: <http://www.businessinsider.com/americas-most-bankrupt-cities-2010-4#mayor-mike-bloomberg-new-york-city-11>
- Administrator federal emergency management agency on the national flood insurance program before the House Committee on Financial Services, Subcommittee on Housing and Community Opportunity U.S. House of Representatives Washington, DC.* (2010, April 21) (testimony of Craig Fugate).
- American Institutes for Research. (2002). *A chronology of major events affecting the national flood insurance program.* The American Institutes for Research, The Pacific Institute for Research, Deloitte & Touche LLP.
- Ashley, S. T., & Ashley, W. S. (2008). Flood fatalities in the United States. *Journal of Applied Meteorology and Climatology*, 47, 805. doi:10.1175/2007JAMC1611.1
- Assistant administrator and federal insurance administrator mitigation division federal emergency management agency department of homeland security before the United States Senate Committee on Banking, Housing, and Urban Affairs* (2007, October 2) (testimony of David I. Maurstad).
- Associated Press. (2010). *FEMA flood maps are full of errors, cities say.* Retrieved from msnbc.com website: <http://www.msnbc.msn.com/id/35045333/ns/weather/t/fema-flood-maps-are-full-errors-cities-say/>
- Associated Press. (2011). *Two northeastern counties balking at flood zone maps.* Retrieved from Mississippi Business Journal website: <http://msbusiness.com/2011/01/two-northeastern-counties-balking-at-flood-zone-maps/>
- Association of State Floodplain Managers. (2006). *Expanding the mitigation toolbox: The demolish/rebuild option.* Madison, WI. Association of State Floodplain Managers.
- Association of State Floodplain Managers. (2007). *National flood programs and policies in review.* Madison, WI. Association of State Floodplain Managers.
- Association of State Floodplain Managers. (2011). *ASFPM comments on the public assistance bottom-up review.* Madison, WI. Association of State Floodplain Managers.



- Association of State Floodplain Managers. (2011, March 11). *Legislative proposals to reform the national flood insurance program subcommittee on insurance, housing and community opportunity house committee on financial services* (testimony of Sally McConkey).
- Baca, A. M. (2008). *On call: Disaster reserve workforce news*. Washington, DC: Federal Emergency Management Agency.
- Baxter, K. (2011). In Keefe S. Data extracted from FEMA database.
- Bea, K. (2010). *Federal Stafford Act disaster assistance: Presidential declaration, eligible activities, and funding*. (Congressional Report No. RL33053). Washington, DC: Library of Congress Congressional Research Service.
- Bellavita, C. (2008). Changing homeland security: What is homeland security? *Homeland Security Affairs, IV*(2).
- Bennett, K. G. (2009). In Craig Fugate F. A. (Ed.). *Recommendations on the Stafford act and related federal policies: Public assistance and individual assistance issues*.
- Berke, P. R., & Campanella, P. J. (2006). Planning for postdisaster resiliency. *The Annals of the American Academy of Political and Social Science, 604*, 192.  
doi:10.1177/0002716205285533
- Birkland, T., & Waterman, S. (2008). Is federalism the reason for policy failure in Hurricane Katrina? *Publius: The Journal of Federalism, 38*(4), 692.  
doi:10.1093/publius/pjn020
- Boisvert, R. N., & Rettger, M. J. (1979). Flood insurance or disaster loans: An economic evaluation. *American Journal of Agricultural Economics, 61*(3), 496–505.
- Borut, D. J. (2009). In Fugate C. (Ed.). *Comment on FEMA's notice of proposed rulemaking on "Disaster assistance; public assistance repetitive damage."* (docket ID FEMA—2008—0006, RIN 1660-AA47) under the disaster Mitigation Act of 2000 National League of Cities.
- Bourgon, J. (2007). Responsive, responsible and respected government: Towards a new public administration theory. *International Review of Administrative Sciences, 73*(1), 7.
- Brody, S. D., Godschalk, D., & Burby, R. J. (2003). Mandating citizen participation in plan making. Six strategic planning choices. American Planning Association. *Journal of the American Planning Association, 245*.
- Brody, S. D., Kang, J. E., & Bernhardt, S. (2010). Identifying factors influencing flood mitigation at the local level in Texas and Florida: The role of organizational capacity. *Natural Hazards, 52*.

- Brody, S. D., Zahran, S., Maghelal, P., Grover, H., & Highfield, W. E. (2007). The rising costs of floods: Examining the impact of planning and development decisions on property damage in Florida. *Journal of the American Planning Association*, 73(3), 330–345.
- Browne, M. J., & Halek, M. (2009). *Managing flood risk: A discussion of the national flood insurance program and alternatives*. A working paper.
- Burby, R. J. (2003). Making plans that matter: Citizen involvement and government action. *Journal of the American Planning Association*, 69(1), 33.
- Burby, R. J. (2006). Hurricane Katrina and the paradoxes of government disaster policy: Bringing about wise governmental decisions for hazardous areas. *Annals of the American Academy of Political and Social Science*, 604, 171.
- Burby, R. J. (Ed.). (1998). *Cooperating with nature. Confronting natural hazards with land-use planning for sustainable communities*. Washington, DC: John Henry Press.
- Buskey, N. (2010). Lawmakers call for transparency from FEMA. Retrieved from Homatoday.Com website:  
<http://www.houmatoday.com/article/20100325/ARTICLES/100329595?p=3&tc=pg>
- Caniglia, J. (2011). New flood maps will raise residents' insurance premiums and hurt property values. Retrieved from Cleveland.Com website:  
[http://blog.cleveland.com/metro/2011/02/new\\_flood\\_maps\\_will\\_cost\\_resid.html](http://blog.cleveland.com/metro/2011/02/new_flood_maps_will_cost_resid.html)
- Carafano, J. J., & Weitz, R. (2006). In The Heritage Foundation (Ed.), *Learning from disaster: The role of federalism and the importance of grassroots response*. Retrieved from The Heritage Foundation website:  
<http://www.heritage.org/research/reports/2006/03/learning-from-disaster-the-role-of-federalism-and-the-importance-of-grassroots-response>
- Center for a Better Life. (n.d.). Compounding catastrophe: The impact of humans on natural disasters. Retrieved from  
[http://www.centerforabetterlife.com/eng/magazine/article\\_detail.lasso?id=81](http://www.centerforabetterlife.com/eng/magazine/article_detail.lasso?id=81)
- Centers for Disease Control and Prevention. (2010). *Weather related morbidity and mortality*. Retrieved from  
[http://www.cdc.gov/climatechange/effects/weather\\_related.htm](http://www.cdc.gov/climatechange/effects/weather_related.htm)
- Changnon, S. A. (2000). In Parker D. J. (Ed.). *Floods, 1*. London, England: Butler and Tanner, Ltd.

- Chertoff, M. (2008). *Remarks by homeland security secretary Michael Chertoff at Harvard University*. Retrieved from [http://www.dhs.gov/xnews/speeches/sp\\_1203020606566.shtm](http://www.dhs.gov/xnews/speeches/sp_1203020606566.shtm)
- Cigler, B. A., Stiftel, B., & Burby, R. J. (1987). Rural community responses to a national mandate: An assessment of floodplain land-use management. *Publius: The Journal of Federalism*, 17(4), 113.
- Clarke, S. E., & Chenoweth, E. (2006). The politics of vulnerability: Constructing local performance regimes for homeland security. *Review of Policy Research*, 23(1), 95–114. doi:10.1111/j.1541-1338.2006.00187.x
- Clary, B. B. (1985). The evolution and structure of natural hazard policies. *Public Administration Review*, 45(Special Issue: Emergency Management: A Challenge for Public Administration), 20–28.
- Comptroller General of the United States. (1975). *Tulsa, Oklahoma's participation in the national flood insurance program* (No. B-167790). GPO: Washington, DC.
- Congressional Budget Office. (2009). *The national flood insurance program: Factors affecting actuarial soundness: A CBO paper*. (Pub. No. 4008). Washington, DC: U.S. Government Printing Office. Retrieved from <http://www.cbo.gov/ftpdocs/106xx/doc10620/11-04-FloodInsurance.pdf>;
- Conrad, D. R., McNitt, B., & Stout, M. (2000). *Higher ground: A report on voluntary property buyouts in the Nation's floodplains, A common ground solution serving people at risk, taxpayers and the environment*. Washington, DC: Taxpayers and the National Wildlife Federation.
- Cooper, R. (2010). *Revising the Stafford Act: Cries for common sense*. The George Washington University Homeland Security Policy Institute. Retrieved from <http://securitydebrief.com/2010/05/13/revising-the-stafford-act-cries-for-common-sense/>
- Czerwinski, S. J. (2001). *Flood insurance: Information on the financial condition of the national flood insurance program* (GAO-01-992T). Washington, DC: U.S. Government Printing Office.
- Davidson, B. (2005). How quickly we forget: The national flood insurance program and floodplain development in Missouri. *Journal of Law & Policy*, 19, 365.
- Department of Homeland Security Office of Inspector General. (2009). *FEMA's implementation of the flood insurance reform act of 2004* (No. OIG-09-45). Washington, DC: U.S. Government Printing Office.

- Department of Homeland Security. (February 2010). *Quadrennial homeland security review report: A strategic framework for a secure homeland*. Washington, DC: GPO.
- Despite benefits, towns reject FEMA flood buyouts. (2010). Retrieved from The Gazette.Com website: <http://thegazette.com/2010/04/18/despite-benefits-towns-reject-fema-flood-buyouts/>
- Disaster Mitigation Act of 2000, Pub. L. No. 106–390. 114 Stat. 1552 (2000). Retrieved from U.S. Government Printing Office website: <http://www.gpo.gov/fdsys/pkg/PLAW-106publ390/html/PLAW-106publ390.htm>
- Downton, M., Miller, B., & Pielke, R. A. J. (2005). Reanalysis of U.S. national weather service flood loss database. *Natural Hazards Review*, 6(1), 13.
- England, C., & Competitive Enterprise Institute. (1996). The business and regulation of insurance: A primer. Retrieved from <http://cei.org/studies-issue-analysis/business-and-regulation-insurance-primer>
- Enos, E. (2008, May 1). CUSTOM FRAME. *Fire Chief*.
- Environmental Protection Agency. (1979). *Statement of procedures on floodplain management and wetlands protection*. Retrieved from <http://www.epa.gov/compliance/resources/policies/nepa/#floodplain-management-wetlands>
- Evans, D. (2009). *Study on government response to Katrina highlights need for Stafford Act reform* Institute for Southern Studies. Retrieved from <http://www.southernstudies.org/2009/06/post-14.html>
- Federal Disaster Relief Act (Public Law 81-875), Pub. L. No. 106-390. 114 Stat. 5133. Retrieved from <http://law.jrank.org/pages/6157/Disaster-Relief.html>
- Federal Emergency Management Agency. Federal Insurance and Mitigation Administration. (2002). *National flood insurance program. program description*.
- Federal Emergency Management Agency. Federal Insurance and Mitigation Administration. (2007). *Grant program comparison mitigation division grant programs*. Washington, DC: Federal Emergency Management Agency, Federal Insurance and Mitigation Administration.
- Federal Emergency Management Agency. Federal Insurance and Mitigation Administration. (2011). *National flood insurance program (NFIP) guidance for conducting community assistance contacts and community assistance visits*. Washington, DC: GPO.

- Federal Emergency Management Agency. (2006a). *National flood insurance program community rating system: A local official's guide to saving lives preventing property damage reducing the cost of flood insurance*. Washington, DC: GPO.
- Federal Emergency Management Agency. (2006b). *National flood insurance program community rating system. CRS credit for outreach projects*. Washington, DC: GPO.
- Federal Emergency Management Agency. (2006c). *New policy links reconstruction dollars to advisory flood elevations*. Retrieved from <http://www.fema.gov/news/newsrelease.fema?id=23282>
- Federal Emergency Management Agency. (2009). *Missouri flood buyout saves lives, heartache, and money full mitigation best practice story multiple counties, Missouri*. Retrieved from <http://www.fema.gov/mitigationbp/bestPracticeDetailPDF.do?mitsId=6370>
- Federal Emergency Management Agency. (2010a). *FEMA's risk mapping, assessment, and planning (risk MAP) national digital elevation acquisition and utilization plan for floodplain mapping*. Washington, DC: GPO.
- Federal Emergency Management Agency. (2010b). *Issue paper: Bottom up review of FEMA's public assistance program*. Washington, DC: Federal Emergency Management Agency.
- Federal Emergency Management Agency. (2010c). *Property acquisition (buyouts) information on implementing successful mitigation projects in your community*. Retrieved from [http://www.fema.gov/government/grant/hma/acquisition\\_q\\_and\\_a.shtm](http://www.fema.gov/government/grant/hma/acquisition_q_and_a.shtm)
- Federal Emergency Management Agency. (2010d). *Talking points. Flood insurance 101*.
- Federal Emergency Management Agency. (2011a). *Community information system database access as of November 2011*
- Federal Emergency Management Agency. (2011b). *Community rating system*. Retrieved from <http://www.fema.gov/business/nfip/crs.shtm>
- Federal Emergency Management Agency. (2011c). *Federal insurance and mitigation administration (FIMA)*. Retrieved from <http://www.fema.gov/about/divisions/mitigation.shtm>
- Federal Emergency Management Agency. (2011d). *Flood*. Retrieved from <http://www.fema.gov/hazard/flood/index.shtm>
- Federal Emergency Management Agency. (2011e). *Hazard mitigation assistance unified guidance*. Washington, DC: GPO.

- Federal Emergency Management Agency. (2011f). *Information for homeowners*. Retrieved from [http://www.fema.gov/plan/prevent/fhm/hm\\_main.shtm](http://www.fema.gov/plan/prevent/fhm/hm_main.shtm)
- Federal Emergency Management Agency. (2011g). *Local official survey. findings on flood risk*. Federal Emergency Management Agency.
- Federal Emergency Management Agency. (2011h). *Number of declarations per calendar year since 1998*. Retrieved April 13, 2011, from <http://www.fema.gov/government/grant/pa/stat1.shtm>
- Federal Emergency Management Agency. (2011i). *Rethinking the NFIP: An update on NFIP reform*. Retrieved September 13, 2011, from [http://www.fema.gov/txt/business/nfip/nfip\\_reform\\_base\\_briefing%20\\_external.txt](http://www.fema.gov/txt/business/nfip/nfip_reform_base_briefing%20_external.txt)
- Federal Interagency Floodplain Management Review Committee. (1994). *Sharing the challenge: Floodplain management into the 21st century. Report to the interagency floodplain management review committee to the administration floodplain management task force*. Washington, DC: GPO.
- Federal Register. (2009). Proposed rules, 74(153), 40124. Washington, DC: GPO.
- FEMA reauthorization and cutting red tape in recovery House Transportation and Infrastructure Committee Subcommittee on Economic Development, Public Buildings and Emergency Management* (2011) (testimony of Chad Berginnis).
- Florida Catastrophic Storm Risk Management Center. (2011). *Helping local governments design financing programs for residential wind mitigation and home hardening projects*. The Florida State University.
- Flynn, S. (2009). Resiliency in the face of unrestricted warfare attacks. *Unrestricted Warfare Symposium Proceedings*. The Johns Hopkins University Applied Physics Laboratory (JHU/APL) and Paul H. Nitze School of Advanced International Studies, Baltimore, MD. 119.
- Fraser, J. C., Doyle, M. W., & Young, H. (2006). Creating effective flood mitigation policies. *Eos*, 87(27), 265.
- Freidel, F. (1999). In Sidey H. S. (Ed.). *Presidents of the United States* (1999th ed.). White House Historical Association.
- Freitag, B., Bolton, S., Westerlund, F., & Clark, J. L. (Eds.). (2009). *Floodplain management: A new approach for a new era*. River Press.

- Gardner, S. (2009). Congressional delegation takes on flood map protest. Retrieved from The Record-Courier website:  
<http://www.recordcourier.com/article/20091003/NEWS/910029980/1004/NONE&parentprofile=1>
- Gaul, G. M., & Wood, A. R. (2000). Uncle Sam insurer of first resort. Retrieved from The Inquirer Philly.Com website:  
<http://marine.rutgers.edu/mrs/education/coast07.htm>
- General Accounting Office. (1973). *Actions needed to provide greater insurance protection to flood prone communities*. (No. B-178737). Washington, DC: GPO.
- General Accounting Office. (1995). *Midwest flood information on the performance, effects, and control of Levees*. (GAO/RCED-95-125). Washington, DC: GPO.
- General Accounting Office. (2004). *Flood map modernization program strategy shows promise, but challenges remain*. (GAO-04-417). Washington, DC: GPO.
- Goad, E., & Weiss, D. J. (2009). *The spiraling cost of inaction: Global warming triggers more disasters*. Retrieved from Center for American Progress website:  
[http://www.americanprogress.org/issues/2009/08/presidential\\_disasters.html](http://www.americanprogress.org/issues/2009/08/presidential_disasters.html)
- Godschalk, D. (2003). Urban hazard mitigation: Creating resilient cities. *Natural Hazards Review*, 4, 136.
- Godschalk, D., Brody, S., & Burby, R. (2003). Public participation in natural hazard mitigation policy formation: Challenges for comprehensive planning. *Journal of Environmental Planning and Management*, 46(5), 733.
- Goodspeed, T. J., & Haughwout, A. F. (2007). *On the optimal design of disaster insurance in a federation*.
- Government Accountability Office. (2006). *Hurricanes Katrina and Rita disaster relief improper and potentially fraudulent individual assistance payments estimated to be between \$600 million and \$1.4 billion*. (GAO-06-844T). Washington, DC: GPO.
- Government Accountability Office. (2007). *Hurricane Katrina ineffective FEMA oversight of housing maintenance contracts in Mississippi resulted in millions of dollars of waste and potential fraud*. (GAO-08-106). Washington, DC: GPO.
- Government Accountability Office. (2008a). *Actions taken to implement the post-Katrina emergency management reform act of 2006*. (GAO-09-59R). Washington, DC: GPO.

- Government Accountability Office. (2008b). *Disaster recovery. FEMA's public assistance grant program experienced challenges with gulf coast rebuilding*. (Report to the Committee on Homeland Security and Governmental Affairs, U.S. Senate (GAO-09-129). Washington, DC: GPO.
- Government Accountability Office. (2008c). *Flood insurance FEMA's rate setting process warrants attention*. (GAO-09-12). Washington, DC: GPO.
- Government Accountability Office. (2008d). *Options for addressing the financial impact of subsidized premium rates on the NFIP*. (GAO 09-20). Washington, D.C.: U.S. Government Printing Office.
- Government Accountability Office. (2010a). *Disaster recovery. FEMA's long-term assistance was helpful to state and local governments but had some limitations*. (GAO-10-404). Washington, DC: GPO.
- Government Accountability Office. (2010b). *National flood insurance program (NFIP). continued actions needed to address financial and operational issues*. (GAO 10-631t). Washington, D.C.: U.S. GPO.
- Griffith, C. (1994). The national flood insurance program: Unattained purposes, liability in contract, and takings. *William and Mary Law Review*, 35(2).
- Gulf Coast Reconstruction Watch. (2007). *A new agenda for the gulf coast*. Institute for Southern Studies.
- Haddow, G. D., Bullock, J. A., & Coppola, D. P. (2005). *Introduction to emergency management* (2nd ed.). Elsevier, Butterworth, Heinemann.
- Hajiamiri, S., Kahan, J. P., Knopman, D., & Wu, M. (2006). *From flood control to integrated water resource management: Lessons for the gulf coast from flooding in other places in the last sixty years*. Arlington, Texas: Rand Gulf Coast Policy Institute.
- Hale, B. (2009). What's so moral about the moral hazard? *Public Affairs Quarterly*, 23(1) Retrieved from <http://paq.press.illinois.edu/23/1/hale.html>
- Hayes, T. L., & Jacobson, R. A. (2001). *National flood insurance program actuarial rate review*. Washington, DC: Federal Emergency Management Agency Federal Insurance and Mitigation Administration.
- Hearing on the Stafford Act: A path forward for the nation's emergency preparedness and response system United States Senate Committee on Environment & Public Works*, 109th Cong., 2nd Sess. (2006). Retrieved from [http://epw.senate.gov/public/index.cfm?FuseAction=Hearings.Testimony&Hearing\\_ID=cf6dd0ce-802a-23ad-4707-ca85825d3445&Witness\\_ID=730cde4f-b7d7-405b-8e64-6af89184ab91](http://epw.senate.gov/public/index.cfm?FuseAction=Hearings.Testimony&Hearing_ID=cf6dd0ce-802a-23ad-4707-ca85825d3445&Witness_ID=730cde4f-b7d7-405b-8e64-6af89184ab91)



- Herrera, K. (2011). City hall has budget surplus, but rough times still expected. Retrieved from Santa Monica Daily Press website: <http://www.smdp.com/Articles-c-2011-02-09-71291.113116-City-Hall-has-budget-surplus-but-rough-times-still-expected.html>
- Highfield, W. E., & Brody, S. D. (2006). Price of permits: Measuring the economic impacts of wetland development on flood damages in Florida. *Natural Hazards Review*, 7, 123–130.
- Hodge, S. (2008). Government and academic institutional involvement in gulf coast resiliency. *Sea Grant Law and Policy Journal*, 1, 1.
- Hogue, H. B., & Bea, K. (2006). *Federal emergency management and homeland security organization: Historical developments and legislative options* (Congressional Report No. RL33369). Washington, DC: Library of Congress Congressional Research Service.
- Holladay, S. J., & Schwartz, J. A. (2010). *Flooding the market, the distributional consequences of the NFIP*. (No. Policy Report No. 7). New York, New York: Institute for Policy Integrity.
- Holtcamp, W. (2006). *Sustainable solutions for the San Jacinto*. Retrieved from Clean website: <http://www.cleanhouston.org/sustainable-solutions.asp>
- Holway, J. M., & Burby, R. J. (1990). The effects of floodplain development controls on residential land values. *Land Economics*, 66(3), 259.
- Homeland Security Institute. (2007). *Financing recovery from catastrophic events*. (No. Task 06-42). Arlington, VA: Department of Homeland Security.
- Homeland Security News Wire. (2011). “Burying” FEMA in DHS was “huge structural and operational mistake.” Retrieved from <http://www.homelandsecuritynewswire.com/burying-fema-dhs-was-huge-structural-and-operational-mistake>
- Hoover, M. (2005). Rowboat federalism: The politics of U.S. disaster relief. *Monthly Review*, July 4, 2011. Retrieved from MRZine website: <http://mrzine.monthlyreview.org/2005/hoover281105.html>
- Hunter, R. J., & Director of Insurance for the Consumer Federation of America. (2006). *Testimony of J. Robert Hunter, Director of Insurance, Consumer Federation of America before the Committee on Banking, Housing and Urban Affairs of the United States Senate regarding proposals to reform the National Flood Insurance Program*. Washington, DC: GPO.

- Ingram, D. (2011). Rethinking FEMA's public assistance programs for communities affected by disaster. [Web log comment].  
<http://blog.fema.gov/2011/05/rethinking-femas-public-assistance.html>
- Interagency Floodplain Management Review Committee. (1994). *Sharing the challenge: Floodplain management into the 21st century*. Washington, DC: Interagency Floodplain Management Review Committee.
- Jones, S. K. (2010). Report: Economic benefits of levees outweigh flooding costs. Retrieved from Insurance Journal website:  
<http://www.insurancejournal.com/news/southcentral/2010/02/04/107128.htm>
- Jones, S. K. (2010, July 15). Report: Counties with levees are among the Nation's most economically sound. Retrieved from Insurance Journal website:  
<http://www.insurancejournal.com/news/southcentral/2010/02/04/107128.htm>
- Kahan, J. P., Wu, M., Hajiamiri, S., & Knopman, D. (2006). *From flood control to integrated water resource management: Lessons for the gulf coast from flooding in other places in the last sixty years*. Arlington, Texas: Rand Gulf Coast Policy Institute.
- Karl, T. R., Melillo, J. M., & Peterson, T. C. (Eds.). (2009). *Global climate change impacts in the United States*. U.S. Global Change Research Program. Cambridge University Press.
- Kick, E. L., Fraser, J. C., Fulkerson, G. M., McKinney, L. A., & DeVries, D. H. (2011). Repetitive flood victims and acceptance of FEMA mitigation offers: An analysis with community–system policy implications. *Disasters*, 35(3), 510.  
doi:0.1111/j.1467-7717.2011.01226.x
- King, P. B. (2009). In Office of Chief Counsel, Federal Emergency Management Agency. (Ed.). *Federal emergency management agency docket ID: FEMA-2008-0006* American Public Works Association.
- King, R. O. (2005). *Federal flood insurance: The repetitive loss problem*. (Congressional Report No. RL32972). Washington, DC: Library of Congress Congressional Research Service.
- King, R. O. (2008). *Midwest flooding disaster: Rethinking federal flood insurance?* (Congressional Report No. RL34610). Washington, DC: Library of Congress Congressional Research Service.
- King, R. O. (2009). *National flood insurance program: Background, challenges, and financial status*. (Congressional Report No. R40650). Washington, DC: Library of Congress Congressional Research Service.

- King, R. O. (2010). *Mandatory flood insurance purchase in remapped residual risk areas behind levees*. (Congressional Report No. R41056). Washington, DC: Library of Congress, Congressional Research Service.
- King, R. O. (2011). *National flood insurance program: Background, challenges, and financial status*. (Congressional Report No. R40650). Washington, DC: Library of Congress Congressional Research Service.
- Kunreuther, H. (1996). Mitigating disaster losses through insurance. *Journal of Risk and Uncertainty*, 12, 171.
- Kunreuther, H. (2008). Reducing losses from catastrophic risks through long-term insurance and mitigation. *A Social Research Conference at the New School Disasters: Recipes and Remedies*.
- Kunreuther, H., Meyer, R., & Michel-Kerjan, E. (2009). *Overcoming decision biases to reduce losses from natural catastrophes*. Philadelphia, PA: Risk Management and Decision Processes Center The Wharton School of the University of Pennsylvania.
- Larson, L. A., & Plasencia, D. (2001). No adverse impact: A new direction in floodplain management policy. *Natural Hazards Review*, 2(4), 167–181.
- Legislative proposals to reform the national flood insurance program, Part I, hearing before the subcommittee on insurance, housing, and community opportunity of the committee on financial services U.S. House of Representatives, 112th Cong., 1st Sess.* (2011).
- Lehrer, E. (2008). In Competitive Enterprise Institute (Ed.). *Reforming the national flood insurance program after 35 years of failure*. Washington, DC.
- Lindsay, B. R., & Murray, J. (2011, April 12). *Disaster relief funding and emergency supplemental appropriations*. (Congressional Report No. R40708). Washington, DC: Library of Congress, Congressional Research Service.
- Love, N. P. (2009, March 25). *FEMA's hazard mitigation grant program: Overview and issues*. (Congressional Report No. R40471). Washington, DC: Library of Congress, Congressional Research Service.
- McCarthy, F. X. (2010, March 9). *FEMA disaster cost-shares: Evolution and analysis*. (Congressional Report No. R41101). Washington, DC: Library of Congress Congressional Research Service.
- McCarthy, F. X., & Keegan, N. (2009, July 10). *FEMA's pre-disaster mitigation program: Overview and issues*. (Congressional Report No. RL34537). Washington, DC: Library of Congress Congressional Research Service.

- McMillan, C. M. (2007). Comment: Federal flood insurance policy: Making matters worse. *Houston Law Review*, 44, 471. Retrieved from [http://www.houstonlawreview.org/archive/downloads/44-2\\_pdf/7\\_McMillan.pdf](http://www.houstonlawreview.org/archive/downloads/44-2_pdf/7_McMillan.pdf)
- Mileti, D. (Ed.). (1999). *Disasters by design: A reassessment of Natural hazards in the United States*. Washington, DC: Joseph Henry Press.
- Miller, C. (2010). *Miller: Michigan property owners have become the NFIP's personal ATM machine*. Retrieved from <http://candicemiller.house.gov/2011/02/miller-end-the-national-flood-insurance-program.shtml>
- Mississippi Department of Finance and Administration. (2007). *Request for proposal to provide professional services*. RFP NO. \_MS200707190.
- Moss, M., & Shelhamer, C. (2007). *The Stafford act: Priorities for reform*. New York University, The Center for Catastrophe Preparedness and Response.
- Moss, M., Shellhamer, C., & Berman, D. (2009). The Stafford act and priorities or reform. *Journal of Homeland Security and Emergency Management*, 6(1).
- National Emergency Management Agency. (2009). *Draft recommendations for an effective national mitigation effort*.
- National Emergency Management Association. (2010). *Recommendations for an effective national mitigation effort*.
- National Emergency Management Association. (2011). *Proposal from the states on reform of federal homeland security & emergency management grants*.
- National Institute of Building Sciences, Multi-Hazard Migration Council. (2010). *Security and disaster preparedness*. Washington, DC: GPO.
- National Oceanic and Atmospheric Administration Coastal Services Center. (2010). *Hazard and resiliency planning: Perceived benefits and barriers among land use planners final research report*
- National Research Council. (1996). In Stern P. C., Fineberg H. V. (Eds.). *Understanding risk: Informing decisions in a democratic society*. Washington, DC: National Academy Press.
- National Wildlife Federation. *Coast and floodplain protection*. Retrieved from <http://www.nwf.org/Global-Warming/Policy-Solutions/Protecting-Wildlife-and-Habitat/Coast-and-Floodplain-Protection.aspx>

- New York State Floodplain and Stormwater Managers Association. (2010). *Rethinking the national flood insurance program (NFIP)*. Albany, NY: New York State  
Retrieved from  
[http://www.stcplanning.org/usr/Program\\_Areas/Flood\\_Mitigation/NFIP\\_Reform\\_White\\_Paper\\_NYSFSMA.pdf](http://www.stcplanning.org/usr/Program_Areas/Flood_Mitigation/NFIP_Reform_White_Paper_NYSFSMA.pdf)
- Norton, C. (2009). FEMA helps raise flood-prone Snoqualmie homes. Retrieved from KOMONEWS.Com website:  
<http://www.komonews.com/news/local/60945332.html>
- Pielke, R. A. J., & Downton, M. W. (2000). *Precipitation and damaging floods: Trends in the United States*. American Meteorological Society.
- Pinter, N. (2005). One step forward, two steps back on U.S. floodplains. *Science*, 308(5719), 207–208.
- Platt, R. H. (2000). Extreme Natural Events: Some Issues for Public Policy. *Extreme Events Workshop, Boulder, Colorado*, Boulder, CO.
- Powell, M., & Grunwald, M. (2005). The lure of coastal life outweighs the risks. Retrieved from The Washington Post website:  
<http://www.washingtonpost.com/wp-dyn/content/article/2005/09/06/AR2005090601922.html>
- Public Risk Management Association. (2010). *PRIMA's response to FEMA's proposed rule: Reduction of financial assistance to facilities with repetitive damage*. Public Risk Management Association.
- RAND Gulf States Policy Institute. (2010). *Call for reform in the residential insurance market after Hurricane Katrina*. RAND Institute for Civil Justice.
- Reilley, S. (2009). *The Stafford act. The old man and the storm*. Retrieved from Frontline PBS website: <http://www.pbs.org/wgbh/pages/frontline/katrina/fail/stafford.html>
- Review of the general accounting office report on FEMA's activities after the terrorist attacks on September 11, 2001: Hearing before the Subcommittee on Clean Air, Climate Change, and Nuclear Safety and the Committee on Environment and Public Works United States Senate*, 108th Cong., 1st Sess. (2003, September 24).
- Rovins, J. E. (2009). *Stand-alone mitigation plans and recovery costs: A study of the Florida local mitigation strategies*. (doctoral dissertation). Tulane University.
- Salvesen, David University of North Carolina, Chapel Hill. *Breaking the disaster cycle: Future directions in natural hazard mitigation session title: Flood insurance as hazard mitigation; assessing NFIP issues*. Session 05: 9/23/03.
- Santayana, George. (1905/1998). *The life of reason*. Amherst, NY: Prometheus Books.

- Sawyer, T., & Tuchman, J. (2010). Congressman calls for ‘natural defense’ policy to spur effective land-use plans. *Engineering News-Record*, 264(16).
- Singer, S. J. (1990). Flooding the fifth amendment: The national flood insurance program and the “Takings” clause. *Boston College Environmental Affairs Law Review*, (2/3), 323.
- Sixth Framework Programme. (2008). *Recommendations for flood risk management with communities at risk*. (No. T11-07-14). European Community Sixth Framework Programme for European Research and Technological Development.
- Smart Money. *10 things home insurers won't say*. Retrieved from <http://articles.moneycentral.msn.com/Insurance/InsureYourHome/10-things-home-insurers-wont-say.aspx?page=1>
- Stafford act reform: Sharper tools for a smarter recovery: Hearing Before the Ad Hoc Subcommittee on Disaster Recovery of the Committee on Homeland Security and Governmental Affairs, United States Senate, 111th Cong., 2nd sess. (2010, May 12) (testimony of Senator Mary Landrieu).*
- Stakhiv, E. Z., & U.S. Army Corps of Engineers Institute for Water Resources. (1995). Floodplain Planning and Management for Extreme Floods. *U.S.-Italy Research Workshop on the Hydrometeorology, Impacts, and Management of Extreme Floods November*, Perugia (Italy).
- Subcommittee on Insurance, Housing and Community Opportunity Committee on Financial Services hearing on “Legislative proposals to reform the national flood insurance program” (2011, March 11) (testimony of Steve Ellis).*
- Sylves, P. D. R., Cumming, J. D., & William, R. (2004). FEMA’s path to homeland security: 1979–2003. *Journal of Homeland Security and Emergency Management*, 1(2).
- Testimony Before the House Transportation & Infrastructure Subcommittee on Economic Development, Public Buildings and Emergency Management U.S. Mayors Speak Out: Addressing Disasters in Cities. Director & Homeland Security Advisor Arkansas, Department of Emergency Management, President, National Emergency Management Association (2010, March 4) (testimony of David Maxwell).*
- Texas Division of Emergency Management. (2008). *Hurricane Ike impact report*. State of Texas.
- The Opportunity Agenda. (2005). *The state of opportunity one year after hurricane Katrina investing in FEMA: A role for government in protecting opportunity*. Washington, DC: The Tides Center.

- The United States Conference of Mayors. (2010). *Report of the stafford act reform task force*. Washington, DC 2000: The United States Conference of Mayors.
- Thomas, E. A. (2007). In Colorado Association of Stormwater and Floodplain Managers (Ed.). *Legal issues in the floodplain—navigating the confluence of property rights, floodplain management, wetlands, levees and dams*.
- Toal, M. (2009). FEMA property buyouts aren't quick and easy. Retrieved from Beaumontenterprise.Com website:  
<http://www.beaumontenterprise.com/news/article/FEMA-property-buyouts-arent-quick-and-easy-699885.php#ixzz1T3n2fHVw>
- U.S. Commission on Ocean Policy. (2004). *An ocean blueprint for the 21st century*. Washington, DC: U.S. Government Printing Office.
- U.S. Congress. (1966a). *A unified national program for managing flood losses, report of the national task force for flood control*. HD 465, 89th Cong., 2nd Sess. Washington, DC:
- U.S. Congress. (1966b). *Communication from the president of the united states, transmittal of A report by the Task Force on federal flood control policy: A unified national program for managing flood losses*. Washington, DC: U.S. Government Printing Office.
- University of Colorado, Boulder. Retrieved from  
<http://www.colorado.edu/hazards/gfw/quotes.html>
- Waugh, W. L. (2006). Shelter from the storm: Repairing the national emergency management system after hurricane Katrina. *Annals of the American Academy of Political and Social Science*, 604, 288.
- Weathering the storm: A state and local perspective on emergency management: Emergency Preparedness, Response, and Communications, U.S. House of Representatives*, 112th Cong., 2nd Sess. (2011).
- Weiss, D. J., & Goad, E. (2009). The spiraling cost of inaction global warming triggers more disasters. Retrieved from Center for American Progress website:  
[http://www.americanprogress.org/issues/2009/08/presidential\\_disasters.html](http://www.americanprogress.org/issues/2009/08/presidential_disasters.html)
- White, E. (2011). *Establishing long-term cost effectiveness of FEMA buyouts: A loss avoidance study of the Acquisition/Demolition of 22 properties in Shepherdsville, Kentucky*. (bachelor's). University of Kentucky Martin School of Public Policy and Administration.
- Wildasin, D. E. (2007). In Martin School of Public Policy (Ed.). *Disaster policies: Some implications for public finance in the U.S. federation*. Lexington, KY: University of Kentucky.

- Wildasin, D. E. (2008). Disaster avoidance, disaster relief, and policy coordination in a federation. *Federalism and Decentralized Governance*, Stanford University, Connecticut.
- Wright, J. M. (2000). *The nation's response to flood disasters, A historical account*. Madison, Wisconsin: Association of State Floodplain Managers.
- Young, A. T. (2008). Replacing incomplete markets with a complete mess: Katrina and the NFIP. *International Journal of Social Economics*, 35(8), 561.
- Zahran, S., Brody, S. D., Highfield, W. E., & Vedlitz A. (2010). *Non-linear incentives, plan design, and flood mitigation: The case of the federal emergency management agency's community rating system*. Retrieved from Texas A&M University, College of Architecture website:  
<http://archone.tamu.edu/hrrc/Publications/ResearchReports/Downloads/08-01R+-+Nonlinear+Incentives+Plan+Design+and+Flood+Mitigation.pdf>
- Zahran, S., Brody, S., Peacock, W., Vedlitz, A., & Grover, H. (2008). Social vulnerability and the natural and built environment: A model of flood casualties in Texas. *Disasters*, 32(4), 537.



THIS PAGE INTENTIONALLY LEFT BLANK

## **INITIAL DISTRIBUTION LIST**

1. Defense Technical Information Center  
Ft. Belvoir, Virginia
2. Dudley Knox Library  
Naval Postgraduate School  
Monterey, California