

Contents

<i>Series Preface</i>	vii
<i>Preface</i>	ix
PART I. ANTICIPATING THE UNEXPECTED AS A FOCUS OF PUBLIC POLICY	1
1. Natural Hazards as Public Policy Problems	3
Introduction	3
Natural Hazards as Candidate Problems	4
Characteristics of the Public Policy System	8
Overview of Policy Assisting Study Approaches	10
An Integrative Model	14
Conclusion	24
References	25
2. Natural Hazards Characteristics and Mitigations	27
Earthquake	27
Landslides	30
Expansive Soil	35
Riverine Flooding	37
Storm Surge	38
Tsunami	40
Tornado	41

Hurricane	42
Severe Wind	43
Mitigation Strategies	43
Mitigation Strategies in Developing Countries	55
References	56
3. Public Policy Approaches to Management of Natural Hazards	58
The Matrix of Policy Authority	58
Types of Hazard-Related Public Policies	60
U.S. Federal Natural Hazard Policies and Programs	61
State Land Use Policies	80
State Coastal Zone Regulations	85
Building Code Policy and Authority	87
International Differences in Public Policies toward Natural Hazards	94
Conclusion	95
References	95
PART II. NATURAL HAZARDS RISK ASSESSMENT AND MITIGATION ANALYSIS	99
4. Methodologies for Hazard Analysis	101
Introduction	101
Risk Analysis of Natural Hazards	102
Hazard—Exposure—Vulnerability Estimation	107
Cost Analysis Methods	162
Mitigation Cost Estimates	163
Cost Feasibility Analysis	170
Analysis of Social Impacts	173
Conclusion	186
References	186
5. Natural Hazard Exposure and Loss Analysis	191
Introduction	191
Natural Hazard Effects	193
Natural Hazard Loss Analysis (1970–2000)	197
Referent Effects and Problems	234
Cost Escalations in Catastrophic Losses	237
Federal Liability for Natural Hazard Losses	238
Interstate Tax Transfers Produced by Federal Liability for Natural Hazard Losses	248
Interstate Tax Transfers Produced by Other Federal Policies	249

Conclusion	256
References	261
6. Natural Hazard Mitigation Costs and Impacts	263
Introduction	263
Estimate of Losses for Year 2000	263
Alternative Mitigation Strategies	266
Loss Reduction Analysis	282
Cost Analysis	293
Economic Payoffs from Major Mitigation Groups	311
Social Payoffs from Major Mitigation Groups	315
Conclusion	318
References	321
7. Catastrophic Natural Hazard Occurrences	322
Introduction	322
Approach to Scenario Development	322
Camille II	323
San Francisco Earthquake II	341
Other Scenarios	351
References	352
PART III. NATURAL HAZARDS POLICY PLANNING AND ADMINISTRATION	355
8. Policy Makers, Stakeholders, and Candidate Public Problems	357
The Plight of the Policy Maker	357
Stakeholders in Natural Hazard Policy	359
Candidate Public Problems	368
Establishing Priorities	381
Federal Role	383
Conclusion	388
References	389
9. Constraints on Public Hazards Management Policy Making	391
Introduction	391
Legal Constraints	391
Sociopolitical Constraints	397
Value Constraints	408
Administrative Constraints	413
Economic Constraints	417

Federal Constraints on State and Local Decision Making	417
Conclusion	420
References	424
10. Public Policy Alternatives	427
The Policy Options	427
The Policy Plan	430
Action Possibilities for the Federal Government	440
Action Possibilities for State Governments	456
Action Possibilities for Local Units of Government	458
Action Possibilities for Private Entities	460
The Problem of Future Policy Making	462
References	464
Index	467