

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

**FRAYING COASTAL EDGES:**  
**COASTAL HAZARD ADJUSTMENT**  
**AND**  
**SUSTAINABLE MANAGEMENT**

A thesis presented in partial fulfilment of the requirements  
for the degree of  
Master of Philosophy  
(Resource and Environmental Planning)  
at  
Massey University

Sandra Gaye Proctor

1996

## ABSTRACT

This thesis investigates the development appropriate natural hazard policy and adjustment in New Zealand, through a topic evaluation of the proposed coastal hazard zone methodology presented in Gibb (1994). The thesis is structured around the four contexts: institutional, physical, socio-economic and cultural, that are considered appropriate in the decision-making process about natural hazard policy and adjustment.

The review of literature about managing natural hazards provides the attributes which aid in the formulation of natural hazard policy and adjustment. This literature is augmented with attributes taken from the growing body of sustainability literature. These attributes are then modelled into a theoretical policy and adjustment model, supplemented by checklist. The model developed reflects the paradigm shift to a contextual mode of thinking. This contextual mode of thinking means that a wider range of contexts needs to be considered when developing policies and adjustments.

The review of hazard management in New Zealand highlights the fact that the requirements of the Resource Management Act 1991 (the Act) forces planners to be contextual in their approach to natural hazards. This thesis intends to provide further guidance on how this contextual approach should be undertaken. The key findings of the thesis indicate that natural hazards planning should be considered in the wider arena of resource management planning, with policies and adjustment undertaken fulfilling a broader range of coastal management objectives than the narrow objective of adjustments to natural hazards. The contextual approach to natural hazards planning means that planners and local authorities need to obtain better information to inform their management role under the sustainable management concept. The thesis has concluded that the current pre-occupation on the need for a consistent national approach could be ineffectual because the institutional, physical, socio-economic and cultural variations around New Zealand's coastline precludes emphasis on developing a single methodology for adjustments to natural hazards.

## ACKNOWLEDGMENTS

Well here it is, the completed thesis!!!!!! Finally this long haul is over. I said it would take a year but one year and one month it had to be. Now I am out of here, and on my way out I must say a heartfelt thanks to many people.

First and foremost to my supervisor on this thesis journey, Dr. D. J. Rosier, Department of Planning, Massey University. Without your help, guidance and pestering Jo, I do not think I would have got this thesis off the ground, finished and bound.

I wish to thank the Department of Planning, Massey University for the help they gave, especially Rachel Summers for dealing with the #\*!?!? computer problems that plagued this thesis.

Outside this academic world, I wish to thank all my friends who have urged me on and given support throughout. Special thanks to my flatmate Cheryl (Bez), who put up with my grumps and made me laugh. Without you my 'something sweet' cravings would never have been fulfilled.

An extra special thanks goes to my Mum and Dad, without your support, particularly financially, I do not think I would have made it. To the rest of my family, especially Christine (thanks for the bed) thank you and now I'll get a real job and come and see you.

Finally to Brian, my number one inspiration to finish. Through the ups and downs we have made it and now I'll come and live in Wellsford!!!!!!!

## TABLE OF CONTENTS

Abstract	i
Acknowledgments	ii
Table of Contents	iii
List of Figures	vi
List of Tables	vii
List of Acronyms	viii
Glossary	ix
<b>Chapter One    PROBLEM AND METHODS</b>	<b>1</b>
1.1    Coastal Environment Challenges	3
1.1.1    Overall Challenges	4
1.1.2    Institutional Challenges	7
1.1.3    Physical Challenges	9
1.1.4    Socio-Economic Challenges	9
1.2    Problem Statement	9
1.3    Research Objectives	12
1.4    Limits to Study	13
1.5    Methodology	14
1.5.1    Regional Council Selection	16
1.5.2    Semi-structured Interviews	16
1.5.3    Interview and Submission Data Analysis	18
1.5.4    Topic Evaluation	19
1.6    Chapter Outline	19
<b>Chapter Two    THEORETICAL CONTEXT OF RESEARCH</b>	<b>21</b>
2.1    Historical Review of Natural Hazards Research	21
2.2    Literature Review Findings	22
2.3    Natural Hazards Research Essential Attributes	34
2.3.1    Behavioural Paradigm Essential Attributes	34
2.3.2    Structural Paradigm Essential Attributes	39
2.3.3    Contextual Paradigm Essential Attributes	42
2.4    Natural Hazard Adjustment in a Sustainability Regime	46
2.4.1    Sustainability in the Institutional Context	47
2.4.2    Sustainability in the Physical Context	50
2.4.3    Sustainability in the Socio-Economic Context	50
2.4.4    Sustainability in the Cultural Context	50
2.5    Sustainable Policy and Adjustment Development Model	51

Chapter Three	<b>THE NEW ZEALAND CONTEXT</b>	<b>54</b>
3.1	Pre Resource Management Act 1991 Coastal Hazard Planning	54
3.2	The Contexts of New Zealand Coastal Hazard Planning	57
3.2.1	The Institutional Context	58
3.2.1.1	Local Government Act 1974 and Amendments	58
3.2.1.2	Resource Management Act 1991 and Amendments	59
3.2.1.3	Building Act 1991	68
3.2.2	The Physical Context	69
3.2.2.1	Ecology	70
3.2.2.2	Processes	73
3.2.2.3	Elements	75
3.2.3	The Socio-Economic Context	75
3.2.4	The Cultural Context	78
3.3	Sustainable Policy and Adjustment Development in New Zealand	84
Chapter Four	<b>TOPIC EVALUATION OF GIBB METHODOLOGY</b>	<b>88</b>
4.1	Gibb's Methodology	91
4.2	Implications for the Preparation of Policy Statements and Plans	93
4.2.1	Submissions about Gibbs' Methodology	106
4.2.1.1	Institutional Context	106
4.2.1.2	Physical Context	110
4.2.1.3	Socio-Economic Context	114
4.2.1.4	Cultural Context	115
4.2.2	Interview Responses to Gibbs' Methodology	116
4.2.2.1	Institutional Context	116
4.2.2.2	Physical Context	118
4.2.2.3	Socio-Economic Context	119
4.2.2.4	Cultural Context	119
4.2.3	General Comments about the Methodology	120
4.3	Conclusions	121
Chapter Five	<b>CONCLUSIONS AND THE WAY FORWARD</b>	<b>124</b>
5.1	Principle Thesis Findings	124
5.2	Limitations of Research and Research Methodology	126
5.3	Suggestions for the Improvement of the Preparation of Policy Statements and Plans	127
5.4	Directions for Future Research	130
Appendix One:	Photographs of Raumatangi Beach and Himitangi Beach	132
Appendix Two:	Newspaper Clippings - Wairarapa	138
Appendix Three:	Interview Questions	139
Appendix Four:	Section 35 of the Act	140
Appendix Five:	Fourth Schedule of the Act	141

Appendix Six:	Section 32 of the Act	142
Appendix Seven:	New Zealand Coastal Policy Statement Policies	143
Appendix Eight:	Maori Mythology	144
Appendix Nine:	Submitters to Gibb (1994)	146
Appendix Ten:	Gibb (1994) Recommended Standards and Information Requirements	147
Appendix Eleven:	Gibb (1994) Broad Information Requirements	148
References		160

## LIST OF FIGURES

1.1	Physical and Plan Boundaries in the Coastal Environment	2
1.2	Coastal Management Challenges	5
1.3	Types of Coastal Development	6
1.4	Management Regimes Affecting the New Zealand Coastal Environment	11
1.5	Thesis Methodology	15
1.6	Interview Regional Council Location	17
1.7	Thesis Structure	20
2.1	Contextual Models of Decision-making	33
2.2	Resources and Hazards from Nature and Humans	35
2.3	The Decision Process of Adjusting to Floods	38
2.4	Theoretical Policy and Adjustment Development Model	52
3.1	The Jurisdiction of Act of Parliament over Land and Sea Boundaries, Territories and Zones around the Coastline of New Zealand	55
3.2	Relationship between Policy Statements and Plans produced under the Act	63
3.3	New Zealand Specific Policy and Adjustment Development Model	86
4.1	Analytical framework for Topic Evaluation of Gibb (1994)	89
4.2	Theoretical Boundary Conditions of the Nearshore Zone	91



**LIST OF TABLES**

1.1	Theoretical Range of Adjustments to Coastal Hazards	10
2.1	Review of Natural Hazards Literature 1971 - 1994	23
2.2	Theoretical Policy and Adjustment Development Checklist	53
3.1	The Physical Coastal Context of New Zealand	71
3.2	Socio-Economic Uses and their Effects	77
3.3	New Zealand Specific Policy and Adjustment Development Checklist	87
4.1	Gibb (1994) Standardised Coastal Hazard Zone Formula	93
4.2	Submissions to Gibb (1994) - Stage One	94
4.3	Submissions to Gibb (1994) - Stage Two	102
4.4	Interview Responses to Gibb (1994)	104

**LIST OF ACRONYMS**

AEE	Assessment of Environmental Effects
BA	Building Act 1991
BOP	Bay of Plenty
CEHZ	Coastal Erosion Hazard Zone
CFHZ	Coastal Flooding Hazard Zone
CHZ	Coastal Hazard Zone
CLHZ	Coastal Landslide Hazard Zone
CWHZ	Coastal Wind Erosion Hazard Zone
DOC	Department of Conservation
DP's	District Plans
EIA	Environmental Impact Assessment
LGA	Local Government Act 1974
LIM	Land Information Memorandum
MFE	Ministry for the Environment
MHWS	Mean High Water Springs
NZCPS	New Zealand Coastal Policy Statement
NZPTD	New Zealand Planning Tribunal Digest
NZRMA	New Zealand Resource Management Appeals
PIM	Project Information Memorandum
RMA	Resource Management Act 1991
RP's	Regional Plans
RPS	Regional Policy Statement
TVNZ	Television New Zealand

## GLOSSARY

*Atua*: god, spirit, supernatural being

*Hapu*: sub tribe

*Iwi*: tribe

*Kai*: doer of word (prefix)

*Kaitiaki*: (vb) to guard, to protect  
(noun) guardian, protector

*Kaitiakitanga*: the act of guardianship

*Mahinga mataitai*: cultivation of seafood

*Mana whenua*: authority to speak and act with respect to a particular part of the land

*Mana*: authority, power, prestige, influence

*Manaakitanga*: hospitality

*Mauri*: spiritual life force

*Ranagatiratanga*: the exercise of chiefly authority, power

*Taonga*: property, treasure, artefact, relic

*Tapu*: restricted, sacred

*Tauranga waka*: canoe anchorage

*Tiaki*: to guard, look after

*Tikanga*: customary practices, cultural correct customs and practices

*Toko taunga ika*: pole fishing grounds

*Urupa*: cemetery

*Waahi tapu*: cemetery, reserved ground

*Whakapapa*: genealogy

*Whanau*: family, extended family

*Whanaungatanga*: familial relationships