

Contents

	Page
Abstract	iii
Acknowledgments	v
Contents	vi
List of Tables	viii
List of Figures	ix
Chapter 1: Introduction	
1.1 Background	1
1.2 Objectives	7
1.3 Literature Review	7
1.4 Study Design and Data	9
Chapter 2: Methodology	
2.1 Computer Programs	11
2.2 Statistical Methods	11
Chapter 3: Preliminary Data Analysis	
3.1 Time series plots	17
3.2 The frequency distributions of the marine fish catch	23
3.3 Comparison of the marine fish catches by day, month and year	26
Chapter 4: Regression Analysis and Forecasting	
4.1 Linear regression models of marine fish catches by day, month and year	42
4.2 Trend+seasonal models of monthly marine fish catches	51
4.3 Forecasting the marine fish catches	57

	Page
Chapter 5: Conclusions and Discussion	
5.1 Conclusions	63
5.2 Discussion and Limitations	66
5.3 Future Research	69
References	71
Vitae	73

List of Tables

Table	Page
1.1 Top ten fish-catching countries of the world, 2000	2
1.2 Annual catches and export earnings in Thailand: 1989-2000	3
1.3 Total catch at fishery ports in Thailand in 1990 and 2000	4
1.4 Total catch at fishery ports in Thailand by type of fish	6
1.5 Total value of catch at Pattani Fishery Port in 1999-2003 by type of fish	7
4.1 Linear regression model for cube root of mackerel catch	43
4.2 Linear regression model for cube root of other food fish catch	44
4.3 Linear regression model for cube root of squid catch	45
4.4 Linear regression model for cube root of scads catch	46
4.5 Linear regression model for cube root of trash fish catch	47
4.6 Linear regression model for logarithms of shrimp catch	48
4.7 Linear regression model for logarithms of lobster catch	49
4.8 Linear regression model for logarithms of crab catch	50
4.9 Trend+seasonal model for square roots of mackerel catch	51
4.10 Trend+seasonal model for square roots of other food fish catch	52
4.11 Trend+seasonal and reduced models for square roots of squid catch	53
4.12 Trend+seasonal model for square roots of scads catch	53
4.13 Trend+seasonal and reduced models for square roots of trash fish catch	54
4.14 Trend+seasonal and reduced models for logarithms of shrimp catch	55
4.15 Trend+seasonal and reduced model for logarithms of lobster catch	56
4.16 Trend+seasonal and reduced model for logarithms of crab catch	57

List of Figures

Figure	Page
1.1 Fishing catchment area of Thailand	2
1.2 Distribution of total catch at fishery ports in Thailand in 1990 and 2000	5
3.1 Daily catches of mackerel and other food fish from Pattani Fishery Port: 1999-2003	18
3.2 Daily catches of squid and scads from Pattani Fishery Port: 1999-2003	20
3.3 Daily catches of trash fish and shrimp from Pattani Fishery Port: 1999-2003	21
3.4 Daily catches of lobster and crab from Pattani Fishery Port: 1999-2003	22
3.5 Frequency distributions before and after cube root transformation of daily catch weights of five marine fish types from Pattani Fishery Port: 1999-2003	23
3.6 Frequency distributions before and after natural logarithm transformations of daily catch weights of three marine shellfish types from Pattani Fishery Port: 1999-2003	24
3.7 Frequency distributions before and after square root transformation of monthly catch weights of five marine fish types from Pattani Fishery Port: 1999-2003	25
3.8 Frequency distributions before and after natural logarithm transformations of monthly catch weights of three marine shellfish types from Pattani Sea Port: 1999-2003	26
3.9 Comparison of mackerel (top panel) and other food fish catches by day of week	27
3.10 Comparison of daily catches of squid (top panel) and scads by day of week	28
3.11 Comparison of trash fish catch by day of week	29
3.12 Comparison of shrimp catch by day of week	29
3.13 Comparison of lobster catch by day of week	30

Figure	Page
3.14 Comparison of crab catch by day of week	30
3.15 Comparison of mackerel (top panel) and other food fish by month	31
3.16 Comparison of squid (top panel) and scads catch by month	32
3.17 Comparison of trash fish catch by month	33
3.18 Comparison of shrimp catch by month	34
3.19 Comparison of lobster (top panel) and crab catch by month	35
3.20 Comparison of mackerel catch by year	36
3.21 Comparison of other food fish catches by year	36
3.22 Comparison of squid catch by year	37
3.23 Comparison of scads catch by year	37
3.24 Comparison of trash fish catch by year	38
3.25 Comparison of shrimp catch by year	38
3.26 Comparison of lobster catch by year	39
3.27 Comparison of crab catch by year	39
3.28 Marine fish and shellfish catches by day of week	40
3.29 Marine fish and shellfish catches by month	40
3.30 Marine fish and shellfish catches by year	41
4.1 Fitted model for forecasting the mackerel catch at Pattani Fishery Port	58
4.2 Fitted model for forecasting the other food fish catch at Pattani Fishery Port	58
4.3 Fitted model for forecasting the squid catch at Pattani Fishery Port	59
4.4 Fitted model for forecasting the scads catch at Pattani Fishery Port	60
4.5 Fitted model for forecasting the trash fish catch at Pattani Fishery Port	60
4.6 Fitted model for forecasting the shrimp catch at Pattani Fishery Port	61

Figure	Page
4.7 Fitted model for forecasting the lobster catch at Pattani Fishery Port	62
4.8 Fitted model for forecasting the crab catch at Pattani Fishery Port	62
5.1 Model checking for forecasting the marine fish at Pattani Fishery Port	68