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ABSTRACT

This thesis describes the active structures of Myanmar and its surrounding regions, and the earthquake geology of the major active structures. Such investigation is needed urgently for this rapidly developing country that has suffered from destructive earthquakes in its long history. To archive a better understanding of the regional active tectonics and the seismic potential in the future, we utilized a global digital elevation model and optical satellite imagery to describe geomorphologic evidence for the principal neotectonic features of the western half of the Southeast Asia mainland. Our investigation shows three distinct active structural systems that accommodate the oblique convergence between the Indian plate and Southeast Asia and the extrusion of Asian territory around the eastern syntaxis of the Himalayan mountain range. Each of these active deformation belts can be further separated into several neotectonic domains, in which structures show distinctive active behaviors from one to another.

In order to better understand the behaviors of active structures, we focused on the active characteristics of the right-lateral Sagaing fault and the oblique subducting northern Sunda megathrust in the second part of this thesis. The detailed geomorphic investigations along these two major plate-interface faults revealed the recent slip behavior of these structures, and plausible recurrence intervals of major seismic events. We also documented the ground deformation of the 2011 Tarlay earthquake in remote eastern Myanmar from remote sensing datasets and post-earthquake field investigations. The field observation and the remote sensing measurements of surface ruptures of the Tarlay earthquake are the first study of this kind in the Myanmar region.
# TABLE OF CONTENTS

Acknowledgements ........................................................................................................................... iii
Abstract................................................................................................................................................ vi
Table of Contents............................................................................................................................. vii
List of Illustrations ........................................................................................................................... xii
List of Tables ...................................................................................................................................... xvi

Chapter 1
Introduction ..................................................................................................................................... 1

Chapter 2
Active Tectonics and Earthquake Potential of the Myanmar region....................... 4
Abstract................................................................................................................................................. 4
Introduction......................................................................................................................................... 5
Methodology........................................................................................................................................ 6
Neotectonics of the Myanmar region.............................................................................................. 9
The Indoburman range...................................................................................................................... 9
Coco-Delta domain.......................................................................................................................... 10
Ramree domain................................................................................................................................. 12
  Deformation front and active structures in the accretionary prism........................................ 13
  Dextral strike-slip faulting in the Indoburman range................................................................. 14
  Active faults and folds east of the Indoburman range............................................................. 15
Dhaka domain ................................................................................................................................ 17
  Chittagong-Tripura fold belt (CTFB)....................................................................................... 19
  The high Indoburman range ...................................................................................................... 23
  East flank of the Indoburman range and beyond.................................................................... 24
Naga domain .................................................................................................................................... 25
The Sagaing domain ...................................................................................................................... 27
  The southern section of the Sagaing fault................................................................................ 29
    Bago segment......................................................................................................................... 29
    Pyu segment.......................................................................................................................... 30
    Nay Pyi Taw segment .......................................................................................................... 31
    Meiktila segment ................................................................................................................ 31
    Sagaing segment ................................................................................................................ 32
  The Northern section of the Sagaing fault.............................................................................. 33
    Tawma and Ban Mauk segments......................................................................................... 34
    In Daw and Mawlu segments............................................................................................ 35
    Shaduzup, Kamaing and Mogang segments...................................................................... 36
The Shan-Sino domain ................................................................................................................. 38
Chapter 3
Earthquakes and slip rate of the Southern Sagaing fault: insights from an offset ancient fort-wall, Lower Myanmar (Burma) ..........................................................113

Abstract............................................................................................................................................ 113
Introduction.................................................................................................................................... 114
Active tectonics of the southern Sagaing fault and surrounding area ................................ 116
Structural overview of southern Myanmar .............................................................................. 116
Southern Sagaing fault........................................................................................................... 117
1930 May Pegu earthquake and 1930 December Pyu earthquake ......................................... 118
Offsets along the Pegu section .............................................................................................. 119
Offset ancient structure.......................................................................................................... 120
The Payagyi ancient fortress .............................................................................................. 120
Estimation of offsets........................................................................................................... 122
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offset reconstruction</td>
<td>125</td>
</tr>
<tr>
<td>Paleoseismologic excavation in the ancient fortress</td>
<td>126</td>
</tr>
<tr>
<td>Sedimentary units in the trench</td>
<td>126</td>
</tr>
<tr>
<td>Fault traces on the southern trench wall</td>
<td>130</td>
</tr>
<tr>
<td>Discussion</td>
<td>131</td>
</tr>
<tr>
<td>The age of ancient fortress</td>
<td>131</td>
</tr>
<tr>
<td>Late Holocene slip rate along the Southern Sagaing fault</td>
<td>132</td>
</tr>
<tr>
<td>Seismic potential and behavior of the southern Sagaing fault</td>
<td>134</td>
</tr>
<tr>
<td>Conclusion</td>
<td>138</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>139</td>
</tr>
<tr>
<td>Reference</td>
<td>139</td>
</tr>
</tbody>
</table>

**Chapter 4**

Permanent upper-plate deformation in western Myanmar during the great 1762 earthquake: Implications for neotectonic behavior of the northern Sunda megathrust

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>156</td>
</tr>
<tr>
<td>Introduction</td>
<td>157</td>
</tr>
<tr>
<td>Active tectonic context</td>
<td>159</td>
</tr>
<tr>
<td>Sea-level indicators</td>
<td>160</td>
</tr>
<tr>
<td>Biological indicators</td>
<td>161</td>
</tr>
<tr>
<td>Oysters</td>
<td>161</td>
</tr>
<tr>
<td>Coral microatolls and coral heads</td>
<td>162</td>
</tr>
<tr>
<td>Erosional coastal features</td>
<td>163</td>
</tr>
<tr>
<td>Shoreline angles</td>
<td>163</td>
</tr>
<tr>
<td>Sea notches</td>
<td>164</td>
</tr>
<tr>
<td>Wave-cut platforms</td>
<td>165</td>
</tr>
<tr>
<td>Coastal emergence</td>
<td>166</td>
</tr>
<tr>
<td>Ramree Island</td>
<td>166</td>
</tr>
<tr>
<td>Northern Ramree Island [Kyauk-Pyu area]</td>
<td>166</td>
</tr>
<tr>
<td>Central Ramree Island</td>
<td>168</td>
</tr>
<tr>
<td>Southern Ramree Island</td>
<td>169</td>
</tr>
<tr>
<td>Eastern Ramree Island</td>
<td>171</td>
</tr>
<tr>
<td>Summary of Ramree Island</td>
<td>172</td>
</tr>
<tr>
<td>Cheduba Island</td>
<td>173</td>
</tr>
<tr>
<td>Northwestern Cheduba Island [Ka-Ma village]</td>
<td>173</td>
</tr>
<tr>
<td>Southwestern Cheduba Island [Ka-I area]</td>
<td>175</td>
</tr>
<tr>
<td>Eastern Cheduba Island [Kan-Daing-Ok area]</td>
<td>177</td>
</tr>
<tr>
<td>Northeastern Cheduba Island [Man-Aung Town area]</td>
<td>179</td>
</tr>
<tr>
<td>Northwestern Cheduba Island [Taung-Yin area]</td>
<td>180</td>
</tr>
<tr>
<td>Summary of Cheduba Island</td>
<td>180</td>
</tr>
<tr>
<td>Discussion</td>
<td>181</td>
</tr>
</tbody>
</table>
Recovering co-seismic uplift from the emergence measurements ................. 181
   Non-tectonic water-level change................................................................. 181
   Interseismic deformation........................................................................... 183
   Possible later uplift events....................................................................... 184
   The uplift pattern of the 1762 earthquake............................................... 185
   The significance of the upper plate structures......................................... 185
   The source of the 1762 earthquake......................................................... 187
   Earthquake recurrence intervals.............................................................. 189

Summary and conclusions ........................................................................... 191
Acknowledgments .......................................................................................... 192
References ........................................................................................................ 193

Chapter 5
Surface Ruptures of the Mw 6.8 March 2011 Tarlay Earthquake, Eastern Myanmar .................................................. 223

Abstract ........................................................................................................ 223
Introduction ..................................................................................................... 224
Field Observations ........................................................................................ 227
   Logistics, scope of reconnaissance and methods ..................................... 227
   Field measurements.................................................................................. 228
      Kya Ku Ni............................................................................................. 228
      Pu Ho Mein ........................................................................................ 229
      Tarlay .................................................................................................. 230
      Eastern end of the rupture ................................................................. 232
Remote sensing observations ....................................................................... 233
      Kya Ku Ni and further west.............................................................. 233
Discussion ...................................................................................................... 235
   Compilation of results............................................................................. 235
      The rupture length of the 2011 Tarlay earthquake ......................... 236
      Preservation of offset features......................................................... 237
      Seismic potential of the rest of the Nam Ma Fault........................... 238
Conclusions ................................................................................................. 239
Data and Resources ..................................................................................... 240
Acknowledgments ........................................................................................ 240
References ...................................................................................................... 241

Chapter 6
Shallow rupture of the 2011 Tarlay earthquake (Mw 6.8), Eastern Myanmar .... 261

Abstract ........................................................................................................ 261
Introduction ..................................................................................................... 262
The Nam Ma Fault and the 2011 Tarlay Earthquake .................................. 263
InSAR data ..................................................................................................... 264
The slip distribution of Tarlay earthquake ................................................................. 265
Discussion ..................................................................................................................... 269
  Characteristics of the surface rupture ................................................................. 269
  Shallow slip deficit ............................................................................................... 271
  Inferred recurrence interval on the Tarlay segment ........................................... 272
Conclusions ................................................................................................................. 273
Data and Resources .................................................................................................... 274
Acknowledgement ...................................................................................................... 274
Reference..................................................................................................................... 274

Appendix 1
Supplementary material of chapter 2 Active Tectonics and Earthquake Potential of the Myanmar region .............................................................. 285

Appendix 2
Supplementary material of chapter 3 Earthquakes and slip rate of the Southern Sagaing fault: insights from an offset ancient fort-wall, Lower Myanmar (Burma) ................................................................. 293
LIST OF ILLUSTRATIONS

Chapter 2
1. Major tectonic elements of the Myanmar region and the extreme variation in rainfall that influence preservation of tectonic landforms. .......................................................... 80
2. The overall neotectonic map that we mapped from various dataset and the neotectonic domains that we proposed in and around the Myanmar area. ......................... 82
3. (a) Major active faults within the Coco-Delta domain. (b) Structures along the deformation front include a series of anticlinal structures very close to the trench. (c) Seindaung fault and other dextral faults along the eastern flank of the southern Indoburman range. ................................................................. 83
4. (a) Major active faults within the Ramree domain. (b) The detail bathymetry of the Ramree lobe, showing clear feature of imbricated faults and anticlines. (c) The marine terraces at the western side of the Cheduba Island. (d) The step-like alluvial fans north of the Ramree Island, showing the plausible periodic sea-level changes during the growth of the fan. ............................................................. 84
5. The fault extents and the major offset features along the Thahtay Chaung fault, within the Indoburman Range. .................................................................................. 85
6. The active faults and anticlines of the Dhaka domain. ........................................... 86
7. Geomorphological features of the Churachandpur-Mao fault at two different locations reflect clear dextral motions along the fault. ......................................................... 87
8. Fault and drainage map in the southern part of the Kabaw valley shows no young offset features along a strike-slip element of the fault. ............................................. 88
9. Map and cross sections of the Naga thrust fault system. ........................................ 89
10. The fault segments and historical earthquakes along the central to southern part of the Sagaing fault. .................................................................................................. 90
11. The fault segmentation at the northern Sagaing fault. ........................................ 91
12. The distribution of active faults and historical earthquakes within the Shan-Sino domain between the Sagaing fault and the Red River fault. ........................................ 92
13. Selected examples of the geomorphological expression of active faults of the Shan-Sino domain, ........................................................................................................ 93
14. Tectonic geomorphological expressions of select locations along the Nanting fault. ....................................................................................................................... 94
15. Tectonic geomorphological expressions of the Menglian, Jinghong and Mengxing faults. ......................................................................................................... 95
16. Tectonic geomorphology along parts of the right-lateral Wuliang Shan fault and Lancang fault system .............................................................................................. 96
17. Geomorphological expression of particularly informative parts of the right-lateral Kyaukkyan fault system and the Mae Ping fault zone ........................................ 97
18. Schematic cross sections through two domains of the northern Sunda megathrust show the geometry of the megathrust and hangingwall structures in the Coco-Delta domain and the Ramree domain ......................................................... 98
19. Schematic cross sections through two domains of the northern Sunda megathrust show the geometry of the megathrust and hangingwall structures in the Dhaka domain and the Naga domain ......................................................... 99
Chapter 3

1. Active tectonic framework and recent earthquake history of south-central Myanmar (Burma).................................................................................................................. 143
2. Landforms of the Payagyi ancient fortress, 16 km north of Bago......................................... 145
3. Survey profiles across the northern fortress wall............................................................. 146
4. Stratigraphic columns of the four pits dug through the base of the fortress wall............. 147
5. Fort-wall geometry after restoration by removal of post-fortress sedimentation and erosion.............................................................................................................................. 148
6. The schematic model shows the relationship of the Sagaing fault rupture to the sedimentation on the downthrown side near the northern fortress wall. ................. 149
7. A sequential restoration of the fortress wall offset........................................................ 150
8. Map of the southern wall of Trench 1 .............................................................................. 151
9. The comparison of fault slip-rate estimations along the Sagaing fault averaged over different time spans........................................................................................................... 152
10. Two fault-slip scenarios for the southern Sagaing fault.................................................. 153

Chapter 4

1. The map of Cheduba (Man-Aung) and Ramree Islands above the Sunda megathrust offshore the western coast of Myanmar ......................................................... 197
2. Natural sea-level indicators and their relationships with the tidal levels in the area of Cheduba and Ramree Islands................................................................. 199
3. The patterns of marine terraces, current drainages and tidal flats show the eastward tectonic tilting in northern Ramree Island over the past several thousand years................................................................. 200
4. Photograph and line sketch of site KPU-15 .................................................................... 201
5. The patterns of modern drainages and marine terraces of the central-western coast of Ramree Island show an eastward tilt. ............................................................. 202
6. Field survey sites at the central-western Ramree coast.................................................. 203
7. The different geomorphic characteristics of the southwestern and southeastern Ramree coast indicate the long-term uplift and eastward tilt of southern Ramree Island ................................................................. 204
8. Three topographic profiles at southwestern Ramree Island show ~1.5 m of land-level change of T1 after mid-16th century................................................................. 205
9. Photograph and line sketch of an inferred mid-Holocene wave-cut notch and wave-cut platform on the southeastern coast of Ramree Island. ................................. 206
10. Map and a topographic profile of marine terraces near the village of Ka-Ma at the western coast of Cheduba Island .................................................................................. 207
11. Map and a topographic profile of marine terraces near the village of Ka-I at the southern tip of Cheduba Island .............................................................. 208
12. Map of the topographic profiles and sample locations on the marine terraces along the eastern coast of Cheduba Island ......................................................................... 209
13. Topographic profiles north and south of the village of Kan-Daing-Ok ................... 210
14. Marine terraces at the northeastern tip of Cheduba Island and the elevation difference between the modern and uplifted beach berm ........................................ 211
15. Map and a topography profile of marine terraces in the northern part of Cheduba Island ....................................................................................................................... 212
16. A cartoon that shows the contributions of various processes to sea-level history of the past several hundred years ................................................................. 213
17. A compilation of measurements of 1762 uplift values, from our surveys and 19th-century documents .......................................................... 214
18. Three profiles of net post-1762 uplift drawn perpendicular to the megathrust ........ 215
19. A comparison of trench-perpendicular uplift patterns of several well-documented megathrust earthquakes and the 1762 event ........................................... 216
20. A cartoon diagram shows the co-seismic uplift pattern and long-term deformation pattern produced by three different scenario fault ruptures .......................... 217
21. Plausible 1762 fault-slip patterns beneath the central and southern profiles across Cheduba and Ramree Islands ........................................................................ 218
22. Range of nominal recurrence intervals for 1762-like earthquakes, based on the relationships between the long-term uplift rate and the interseismic subsidence rate at the southwestern corner of Cheduba Island (Ka-I area) .... 219

Chapter 5
1. The neotectonic context of Myanmar and adjacent regions .................................. 244
2. Map of the active faults around the Nam Ma Fault, based on geomorphological analysis of optical imagery and SRTM topography ................................................ 245
3. The surface rupture distribution and the field survey locations for the 24 March 2011 Tarlay earthquake along the westernmost section of the Nam Ma Fault ...... 246
4. Map of the westernmost mapped fault rupture crossing paddy fields west of Kya Ku Ni village ........................................................................................................ 248
5. Photographs of the fault rupture in the paddy fields southwest of Kya Ku Ni ....... 249
6. Map view of the area surrounding Pu Ho Mein village, showing where we documented ground failure ................................................................. 251
7. Photographs from three locations in the valley near Pu Ho Mein that may have experienced sinistral tectonic rupture ......................................................... 252
8. Map of sites inspected in the vicinity of the Tarlay Township, showing several locations of left-lateral offset, which coincide with other ground-failure locations along the Nam Lam River ............................................................. 253
Chapter 6
1. The location map of March 2011 Tarlay earthquake (Mw 6.8) near the Myanmar-Laos border................................. 276
2. Detailed mapping of the Tarlay segment at the westernmost section of the Nam Ma fault, based on the 90-meter SRTM and 15-meter Landsat imagery................................................................. 277
3. ALOS L-band InSAR (a & b) and pixel-tracking analysis results (c)................................................................. 278
4. The range offset (RAO) for descending track 486 (a) and the prediction from our preferred finite fault model (b). (c) to (e) shows the ground deformation along three different profiles across the rupture......................................................... 279
5. The original InSAR and the pixel-tracking data, the resampled dataset, the modeled results and the residuals between observations and models ........................................ 280
6. (a) The reduced chi-square plot as a function of the regularization weighting parameters. (b) to (e) Different realizations of models. ................................................................. 281
7. (a) Comparison between field measurements, the upper 600 m fault slip, and the near-fault deformation measured from the AZO pixel tracking analysis along the Tarlay segment. (b) The distribution of fault-slip along the Tarlay segment. (c) The comparison of the normalized slip potency from our preferred model and other earthquake events. ......................................................... 282

Appendix 1
S1. The coverage map of the remote sensing dataset that used in this study. .................. 290
S2. Neotectonic map of Myanmar (Burma)........................................................................ 291
S3. The plate motion vector diagram along the western Myanmar coast..................... 292
## LIST OF TABLES

### Chapter 2
1. Significant earthquakes within the study area since the late-19th century ................. 103
2. Summary of maximum fault offset in the Sino-Shan domain fault system............... 106
3. Scaling relationships for fault length and magnitude that used in this study. ......... 107
4. Proposed Major Seismic Structures of Myanmar and surrounding countries ........ 108

### Chapter 3
1. Analytical results of all of the samples dated in this research............................. 154
2. Earthquake and damage record from different source near Bago from 875 C.E. to May-1930 C.E................................................................. 155

### Chapter 4
1. Radiocarbon ages obtained in this study.................................................... 220
2. U-Th Compositions and $^{230}$Th Ages for Fossil Coral Samples of Myanmar by MC-ICP-MS................................................................. 221
3. Net uplift in Ramree and Cheduba Islands Inferred From Sea Level Indicators .... 222

### Chapter 5
1. Field measurements of the surface rupture of the 24 March 2011 Tarlay earthquake. ........................................................................................................ 259

### Chapter 6
1. ALOS PALSAR data used in this study.......................................................... 287

### Appendix 1
S1. Table S1. Indian-Burma plate convergent rate along the northern Sunda megathrust from various plate rotation models .................................................... 284

### Appendix 2
S1. Table S1. Stories of the May 1930 earthquake from local villagers near the city of Bago (Pegu).......................................................................................... 294
S2. Table S2. Field photographs of small offsets along the Sagaing fault ............... 299
S3. Table S3. Original description of the temporary palace near the Payagyi pagoda from U Kala’s Maha-ya-zaun-gyi (“Great Chronicle”).............................................. 300