



Coastal Resource Assessment for Surf Tourism in Thailand

Steven Andrew Martin

**A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of
Master of Business Administration in Hospitality and Tourism Management**

(International Program)

Prince of Songkla University

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บทคัดย่อ

วิทยานิพนธ์ฉบับนี้อยู่บนกรอบของการสำรวจวิจัยสิ่งแวดล้อมทางกายภาพของประเทศไทย การศึกษานี้มีวัตถุประสงค์เพื่อสำรวจและประเมินทรัพยากรชายฝั่งทะเลอันดามันสำหรับการเล่นกระดานโต้คลื่นซึ่งรวมไปถึงต้นกำเนิดของคลื่น ชนิดของคลื่นและสถานที่ซึ่งมีความเชื่อมโยงกับภูมิภาคและสภาพภูมิประเทศของชายฝั่ง ผู้วิจัยได้รวบรวมข้อมูลและทบทวนวรรณกรรมเกี่ยวกับการจัดการทรัพยากรชายฝั่ง การเล่นกระดานโต้คลื่นในประเทศไทย รวมทั้งงานวิชาการที่เกี่ยวข้องกับการท่องเที่ยวด้านกระดานโต้คลื่น นอกจากนี้ผู้วิจัยได้รวบรวมข้อมูลในเชิงสังคมศาสตร์โดยการสัมภาษณ์เชิงลึกนักเล่นกระดานโต้คลื่นทั้งชาวไทยและชาวต่างชาติ รวมไปถึงประชาชนท้องถิ่น จากการสำรวจสถานที่ที่เหมาะสมสำหรับนักท่องเที่ยวที่ต้องการเล่นกระดานโต้คลื่นพบว่า ทรัพยากรธรรมชาติของประเทศไทยนั้นค่อนข้างจะมีจำกัด นอกจากนี้ยังมีปัญหาคุณภาพของน้ำทะเล ความปลอดภัยในทะเลความสม่ำเสมอของคลื่น คุณภาพของคลื่นและความยากในการเข้าถึงสถานที่อันห่างไกลในช่วงมรสุมตะวันตกเฉียงใต้ การวิจัยชิ้นนี้ได้ค้นพบว่าแม้ธุรกิจท่องเที่ยวด้านการโต้คลื่นในประเทศไทยนั้นยังอยู่ในระดับที่เพิ่งจะเริ่มต้นหากมีศักยภาพและโอกาสที่จะพัฒนาเพื่อให้เกิดความยั่งยืนได้ งานวิจัยฉบับนี้ได้ขยายความเข้าใจทั่วไปของการเล่นกระดานโต้คลื่นในประเทศไทยและเสนอข้อคิดเห็นเกี่ยวกับการจัดการและอนุรักษ์ทรัพยากรชายฝั่งสำหรับการเล่นกระดานโต้คลื่น

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ABSTRACT

Framed as an exploratory research of Thailand's physical environment, this study identifies and assesses the natural surfing resources of the Andaman Coast, including the sources, types and locations of waves in relationship to the regional and coastal topography. Underpinning the research is the collection and review of the literature on coastal resource management, surfing in Thailand, and the scholarly works pertaining to surf tourism. From a social science standpoint, personal interviews with Thai and foreign resident surfers, tourists, and members of local communities were carried out. The investigation locates a wide range of areas suitable for surf tourism and indicates that Thailand's natural resources are somewhat limited and coupled with issues of water quality, ocean safety, regularity and quality of surfing waves, and the accessibility to remote coastal areas during the southwest monsoon. The study finds that surf tourism in Thailand is at a stage of infancy, has potential, and affords an opportunity to develop sustainably. The research advances the overall understanding of surfing in Thailand and offers a series of recommendations for the coastal resource management and conservation of surfing areas.

Key words: surf tourism, coastal resource, coastal assessment, Andaman, Phuket, Thailand

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LIST OF ACRONYMS

AFD	France Development Agency
AUSAID	Australian Cooperation Agency
ASR	Artificial Surfing Reef
CHARM	Coastal Habitats and Resources Management
CORIN	Coastal Resources Institute (Prince of Songkla University)
CRM	Coastal Resource Management
DANIDA	Danish Cooperation Agency
DMCR	Department of Marine and Coastal Resources
DNP	Department of National Park, Wildlife and Plant Conservation
DOF	Department of Fisheries
FIT	Free Independent Travelers
GIS	Global Information System
GTZ	German Cooperation Agency
ICZM	Integrated Coastal Zone Management
IRD	French Research Institute (Cooperative w/Chulalongkorn University)
IUCN	International Union for the Conservation of Nature
MoNRE	Ministry of Natural Resources and Environment
MOTS	Ministry of Tourism and Sports
MPA	Marine Protected Area
MNP	Marine National Park
NOAA	National Oceanic and Atmospheric Administration
NAREBI	Natural Resources and Biodiversity Institute
ONEP	Office of National Environmental Policy and Planning
ONESB	Office of the National Economic and Social Development Board
PBRC	Phuket Boardriders Club
SAMPAN	Strengthening Andaman Marine Protected Areas Networks
SEPF	Socio-Economic Policy and Forecasting Unit
TAT	Tourism Authority of Thailand

LIST OF ACRONYMS (CONTINUED)

TSS	Thailand Surf Series
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
WWF	World Wide Fund for Nature (Thailand Country Program)

CHAPTER 1

INTRODUCTION

While the tropical resort island of Phuket and the vast Andaman Coast are renowned for exotic beaches and a dynamic tourism economy, very little is known about surfing in Thailand. Nonetheless, in recent years recreational surfing has rapidly grown in popularity; it has also gained attention in the domestic and international media, especially the internet. In contrast, the Andaman littoral remains virtually unexplored for surfboard riding. Through a series of comprehensive assessments, this research identifies Thailand's coastal surfing resources and advances the understanding of recreational surfing on Thailand's Andaman Coast. For practical reasons, the Gulf of Thailand is only briefly covered in this research (see Appendix A).

In point of fact, the Andaman's continental coastline is more than 736 kilometers long (Alpha Research, 2007), not including Phuket and numerous islands and coral reef areas. Consequently, this research was framed into complimentary areas of study: one a systematic exploration the littoral as a surfing frontier; the other an investigation into the dimensions of surfing and surf tourism in Thailand. Through an interdisciplinary approach, surf tourism (traveling for the sake of surfing) is addressed within the context of sustainability under the following theoretical framework: a physical-geographic structure, including the exploration, discovery, and assessment of natural resources; and a social science structure, including stakeholder perspectives on ocean safety and coastal management. From theoretical to practical, this investigation is intended to be of interest to surfers, environmentalists, tourism academics, and hospitality and tourism stakeholders in Thailand.

Introduction to the study

This research brings the discussion of coastal surfing resources to light; it presents a case that indeed these resources exist and identifies a range of related issues in order to open a pathway for the conservation of the resource for future generations. From an institutional standpoint, Thai and international organizations can integrate and benefit from this research. As an initial examination, two areas of research within the broad environment of Thailand were rationalized: the survey and assessment of coastal surfing resources in order to determine the plausibility of developing surf tourism; and the

viewpoints of stakeholders through unstructured and semi-structured interviews. Using Phuket Island as a base, this research was conducted from April 2007 through July 2010.

The 2004 Indian Ocean tsunami

The 2004 Indian Ocean tsunami was a powerful impetus behind the coordination and implementation of a variety of complex management schemes focused on the Andaman region; it put a global spotlight on the many issues surrounding coastal resource management in Thailand. Not-for-profit organizations from around the world brought funding and manpower to monitor and promote conservation efforts along the coast and to assist in the rebuilding of the physical infrastructure and the cultural livelihoods of the local inhabitants. Protection strategies were developed for any number of coastal resources, including mangrove forests, sea grass beds, and coral reefs. However, surfing areas have yet to be considered in the context of coastal conservation and management in Thailand, and it is in this context that the following study is positioned.

Introduction to Surfing

Surfers are individuals who ride waves and have deep encounters with the natural environment; and surfing is the sport of riding the surf, especially on a surfboard. It comes from the Hawaiian and Tahitian legacy as an ancient tradition, and hardwood surfboards made in the fifteenth century can be examined in the Bishop Museum in Honolulu today. Such boards were made from various hardwoods, including the endemic Hawaiian *Koa* tree. Walker (2005) attests to the Hawaiians' deep and spiritual connection to the sport:

Primarily through chants, ancient Hawaiian histories and traditions preserve great surfing love stories, surfing prayers, surfing heiau [temples], surfing priesthoods, competitions, and many legendary surfers... surfing has been a part of our history for thousands of years, and when you surf you have that connection, you connect spiritually and physically to all the elements around you, this is a part of you, it's a Hawaiian thing (Walker, 2005: 580).

Hawaiian legends tell of men chanting to the sea in praise of good surf and royalty (Ali'i) competing in surfing competitions. At various surfing sites the ancient

Hawaiians built temples and prayed for favorable surfing conditions, such as at the *Kuemanu Heiau* archeological site at Kahalu'u Beach Park, Hawaii. However, Christian missionaries, who judged surfing to be morally wrong, outlawed the sport in 1821 and 'christianized' various sites by building churches alongside the ruins. Although the activity of surfing nearly vanished from the Hawaiian culture, it was revived in the 1920s by Hawaiian surfer and Olympic gold medalist swimmer Duke Kahanamoku (1890–1968). According to interpretation signage at Kahalu'u, the surfing temple was restored in 1986 by the County of Hawaii. Surfers once again make offerings at the *Kuemanu Heiau* and pray for good waves. Kahalu'u is the island of Hawaii's most prolific area for surf tourism.

Figure 1.1 *Kuemanu Heiau* Archeological Site at Kahalu'u Beach Park, Hawaii



Source: Author (January, 2001)

Introduction to Surfing in Thailand

Foreign travelers in the 1980s introduced the sport to Phuket and occasionally left their surfboards behind, and by the 1990s a handful of Thais were surfing. By the turn of the twenty-first century a new generation of young Phuket surfers had come of age and the sport was popular among this particular group. On September 25, 1999, Thailand's first surfing contest was held Kata Beach in Phuket. Fostered in part by employees from *Cobra*, the world's largest surfboard manufacturing company which is located in Chon Buri (near Bangkok), the contest has remained an annual event. By 2007, the 'Phuket Surfing Contest' at Kata Beach had grown to include more than one-hundred and fifty competitors from thirty-five countries. The contest is supported by community

volunteers, the local surfing clubs, the Kata-Karon Municipality, the Kata-Karon Hotel Association, and a number of local businesses (Nadon, 2008 personal communication).

Consequent to the turn of the twenty-first century, several private surf clubs and organizations began to form in the Phuket area. These include the Phuket Boardriders Club, the Kata-Karon Surf Club, and the Kamala Go Surfing Club. Club members have been instrumental in the promotion and development of surfing in Phuket.

Spawned by the Phuket Boardriders Club in 2009, a new era in Thai surfing began with the commitment of a three year sponsorship by Quiksilver Inc., funding from the TAT, and the formation of the *Thai Surf Series* (TSS), which consolidated three annual contests under one organizer with a strategy to promote regional ties in Asia, especially with Indonesia and Malaysia (Aiyarak, 2009 personal communication). As surfers from overseas now visit Thailand, Phuket is legitimately an emerging surf tourism destination during the southwest monsoon season (May through October). This new market has kindled entrepreneurial spirit among the Thais in recent years, evident by the increase in board rental enterprises which appeared on Phuket surf beaches in 2008 and 2009.

Currently, there are approximately two-hundred and fifty surfers in Phuket, including Thai nationals and foreign residents (Nadon, 2009 personal communication), a number which has grown significantly from about thirty surfers in 2002 (Aiyarak, 2009 personal communication). Figure 1.2 shows Thai surfers at the 2008 Phuket Surfing Contest, Kata Beach.

Figure 1.2 Thai surfers at the 2008 Phuket Surfing Contest, Kata Beach



Source: Author (September, 2008)

1.1 Statement of the Problem

As the growth of surfing and the development of this new tourism product are clearly imminent in Thailand, this research is an appropriate step toward understanding the broad issues surrounding its growth. This research is relevant as Thailand faces a number of environmental challenges along the Andaman seaboard and surfing could prove beneficial to such awareness and to individuals, communities, and the tourism industry.

The situation leading to the research problem stems from a lack of understanding concerning recreational surfing in Thailand in juxtaposition with the broad environment. Buckley (2002a) identifies that surfing environments have a limited capacity to support sustainable use, yet the popularity of surfing among Thais, foreign residents and tourists in Thailand is on the increase. In this context, the knowledge on surfing in Thailand has yet to expand to a degree beneficial to all stakeholders.

The researcher has identified the background to the statement of the problem in the following contexts: the physical environment wherein natural surfing resources cannot be protected or conserved unless they are documented and assessed; and the social environment, wherein perspectives on local water quality, water safety, coastal management, and sustainable tourism cannot be drawn until surfing areas are documented and assessed. Therein, the impetuses to conduct this study are presented in the course of two headings: the reasons for the research; and the research questions. The former are general and the latter are specific.

The reasons for the research

- Thailand's coastal resources, in the context of surfing and surf tourism, are not well understood.
- A methodical assessment of recreational surfing resources for academic purposes had never been conducted.
- As Thailand is a world-renowned tourism destination famous for its beaches and diving, it is reasonable that surf tourism could be a viable option for Thailand, if indeed there were appropriate surfing areas and enough wave activity.
- The southwest monsoon season (which generates wave activity) is synonymous with the *low season*, and surf tourism may pose a solution

and forward-thinking approach to the low image, low hotel occupancy consequence of seasonality.

- Anecdotal evidence indicates that surfing and surf tourism in Thailand are imminent and in a state of genesis, affording an opportunity for research.
- Public concern regarding surf-related drowning in Phuket is a regular topic in the Thai media.
- Public concern regarding water quality during the southwest monsoon season is a regular topic in the Thai media.
- The researcher possesses the necessary background and resources to undertake the research, including previous field experience and access to new and rich sources of information.

The research questions

- Are there adequate waves for surfers?
- Are the waves and conditions suitable for surf tourism in Thailand?
- Are there sufficient and appropriate amenities for surf tourists?
- What are the observable environmental conditions? What are the safety concerns, such as rip currents, water quality or other identifiable hazards?
- Can surfing resources be assessed and documented: what types of waves and ocean conditions occur along Thai coastlines?
- Can the assessment of the Thai coastline form a baseline to establish the manner and nature of the resource and offer evidence for future discussion on recreational surfing and surf tourism in Thailand?
- Have recent events (such as the 2004 Indian Ocean tsunami) had residual effects on the physical environment and coastal resource management, and if so, what are they?
- Who are the stakeholders? What role might stakeholders and the governments play in conservation of the resource?
- Can the monsoon be rebranded as a 'surf season', and if so, what are the implications and consequences?

1.2 Literature Review

This section summarizes and explains prior writings and publications related to the research problems and research questions and serves as background to the study; it explores a diversity of theories and related research. Care has been taken to convey the original meaning implied by each source. Research positions were derived from the results of the literature review as well as from the researcher.

Herein, the review begins with the coastal resource literature, which serves as a gateway to understanding the coastal environment and the issues surrounding its management. Secondly, the review incorporates all available materials specific to the sport of surfing in Thailand. Thirdly, the review includes the comprehensive collection and review of surf tourism research literature identifying the themes, theories, and trends in the field of study.

Three broad areas of literature review

Three areas of literature are determined most relevant for review:

- The academic materials related to coastal resource management and sustainable tourism, including those reflecting coastal issues in Thailand.
- The literature related to surfing in Thailand, albeit non-academic (save for several graduate research papers in lead of this thesis).
- An assemblage of a relatively new body of research developed over the past decade related to surf tourism, which the researcher signitures as 'surf tourism research literature'.

1.2.1 Coastal Resource Management and Sustainable Tourism

Literature and background on Coastal Resource Management (CRM) and Sustainable Tourism are presented in the following sequence:

- Coastal zones
- Coastal Resource Management (CRM)
- Integrated Coastal Zone Management (ICZM)
- Sustainable tourism
- Tourism and coastal resources in Thailand

- CRM in Thailand
- The Andaman Coast
- Tin mining on the Andaman Coast
- Coastal resource and tourism in Phuket in the 1980s
- The 2004 Indian Ocean tsunami and coastal research
- Coral reefs and other coastal resources in Thailand
- International organizations operating on the Andaman Coast in 2010
- Thai CRM organizations
- Mapping of Thai coastal resources

Coastal zones

The ‘coastal zone’ or the ‘littoral’ are the spatial areas where the land meets the sea; they are dynamic, diverse, and in a constant state of flux. From Latin ‘*litoralis*’, the coast is the intertidal zone, or the area between the high water mark which is rarely inundated to shoreline areas that are enduringly submerged. The Organization for Economic Cooperation and Development (OECD, 1993) suggests that a coastal area is by itself not a line, but a ‘band’ in terms of the nature of environment, the interactions of marine and coastal processes, and various management needs. Thus the coast is a complex system expanded on two axes: one is parallel to the shore (longshore); and one is perpendicular to the shore (on/off shore) (ibid.).

Coastal Resource Management (CRM)

Coastal Resource Management (CRM) refers to the study and supervision of the littoral, whereby ‘coastal resource’ is a broad term reflecting the mounting interests in the coastal environment. CRM, as a field of study and in practice, takes into account the myriad viewpoints of any number of stakeholders; it considers the interconnectedness of the various ecosystems and encourages cooperation among individuals, communities, and countries. In a wide sense, coastal resource management represents globalization whereby all countries with marine environments share a common and interrelated ocean. Myles (2009) suggests that CRM organizations around the world should prepare for the diverse challenges that impact coastal destinations, including global warming and climate change, beach safety and security, disaster management, clean water, coastal migration, and coastal industrialization.

Coastal zones constitute a dynamic area of natural change and of increasing human use; they contain rich resources used to produce goods and services and are home to considerable commercial and industrial activities. Consequently, human activities originating from the littoral impose an inordinate amount of pressures on the natural environment (land and sea) as well as on human-kind and their cultural systems. In this context, CRM assumes the theory of ‘sustainability’ and is inherently tied to the issues surrounding nature conservation, recreational activity, and coastal defense. The National Oceanic and Atmospheric Administration identifies the intricate task of balancing ecosystem health with human use in the context of the ocean and CRM, including, but not limited to: “aquaculture, climate change, cumulative impacts, habitat, hazards, marine debris, ocean resources, public access, public involvement, special area plans, and water quality” (NOAA, 2010).

A current trend in coastal resource management is an integrated approach, whereby the interconnected natures of coastal ecosystems are well thought-out amid the implications of human actions. Olsen and Christie (2000) identify that the interconnected issues which coastal management programs address are remarkably similar across a wide range of societal and geographic settings. In broad terms, they are expressions of anthropogenic change to coastal ecosystems brought by intensifying pressures from human activities that are expressed as:

- The degradation or destruction of important coastal habitats (wetlands, coral reefs, seagrass, estuaries) and the resulting loss of biological diversity;
- The decline of estuarine-dependent fish and shellfish populations and their associated fisheries;
- Declining near-shore water quality and changes to the volume, quality, and pulsing of freshwater inflows to estuaries;
- The inappropriate silting of shorefront infrastructure and their subsequent high vulnerability to the impacts of floods, storms, and erosion/accretion processes;
- Reduced access for traditional users and the public to the shore, wetlands, and fishing grounds (ibid.).

Underlying various mandated and voluntary measures is the realization that the natural environment is not static but is itself constantly undergoing change, and that there is a certain hesitation to take full responsibility for introducing sustainability practices. Therein, industries need to develop flexible operational management regimes and enterprises that are responsive to change (Pizam, 2010). The fundamental goal of understanding and managing coastal resources includes the need to balance the intensifying human activities with the changes to ecosystem qualities that they bring. It is currently popular to articulate the goal by casting CRM as a vehicle for progressing toward more sustainable forms of coastal development (Olsen & Christie, 2000). While there is a rich history of traditional use of coastal space and coastal resources around the world, responsible usage and management are often neglected when contemporary markets and associated societal behaviors contrary to traditional use and management increase (ibid).

Integrated Coastal Zone Management (ICZM)

The concept of ‘Integrated Coastal Zone Management’ (ICZM) was built upon the coastal resource management concept by broadening the scope in the context of an ‘integrated approach’, whereby myriad aspects of the coastal zone, including geographical and political boundaries, are incorporated in an endeavor to realize sustainability. Table 1.1 identifies the elements of ICZM in terms of integration:

Table 1.1 Elements of ICZM in Terms of Integration

context of integration	elements of ICZM
all elements of management	from planning and design through implementation, i.e. construction and installation, operation and maintenance, monitoring and feedback, evaluation over time.
all stakeholders	all aspects of the management process.
among disciplines	ecology, geomorphology, marine biology, economics, engineering, political science, law.
management resources	agencies and entities involved.
programs	various sectors, including fisheries, energy, transportation, water resources management, disposal of wastes, tourism, and natural hazards management.
programs and plans	economic development, environmental quality management.
responsibilities for various tasks	among the levels of government - local, state/provincial, regional, national, international - and between the public and private sectors.

Source: Adapted from Bower and Turner (1996)

‘Integration’ in ICZM suggests an interdisciplinary and interrelated course of action to promote sustainable management of coastal zones; it infers the long-standing stability of environmental, economic, societal, cultural and recreational aims bounded by the limits of coastal resources. The Commission of the European Communities (2000) identifies the principles ICZM:

Integrated Coastal Zone Management (ICZM) is a dynamic, multi-disciplinary and iterative process to promote sustainable management of coastal zones. It covers the full cycle of information collection, planning (in its broadest sense), decision making, management and monitoring of implementation. ICZM uses the informed participation and co-operation of all stakeholders to assess the societal goals in a given coastal area, and to take actions towards meeting these objectives. ICZM seeks, over the long-term, to balance environmental, economic, social, cultural and recreational objectives, all within the limits set by natural dynamics. “Integrated” in ICZM refers to the integration of objectives and also to the integration of the many instruments needed to meet these objectives. It means integration of all relevant policy areas, sectors, and levels of administration. It means integration of the terrestrial and marine components of the target territory, in both time and space (The Commission of the European Communities, 2000: 25).

Research indicates that the level of integration may reflect the level success that ICZM achieves in a given area. Bower and Turner (1996) suggest the hypothesis that “There is a positive correlation between the degree of integration achieved and the probability of achieving the estimated benefits.” In theoretical and spatial contexts, the Commission of the European Communities (2000) advocate that ICZM is based on broad and holistic perspectives (thematic and geographic) of coastal zones which are influenced by a myriad of inter-related forces related to hydrological, geomorphological, socio-economic, institutional and cultural systems:

- Successful planning and management of the coastal zone must eschew piecemeal decision making in favor of more strategic approaches that look at the bigger picture, including indirect and cumulative causes and effects.
- There is a need to accept the inalienable long-term interdependence between maintaining the integrity of natural and cultural systems, and the provision of economic and social options.
- The close links (through both human and physical processes) between the marine and terrestrial components of the coastal zone imply the need for consideration of both the marine and terrestrial portions of the coastal zone, as well as the river basins draining into it (Commission of the European Communities, 2000).

Sustainable Tourism

To ensure sustainability in the face of the broad spectrum of tourism environs, a conceptual definition by the United Nations World Tourism Organization (UNWTO, 2004) is focused on three dimensions, specifically the environment, economics, and socio-cultural:

Sustainable tourism development guidelines and management practices are applicable to all forms of tourism in all types of destinations, including mass tourism and the various niche tourism segments. Sustainability principles refer to the environmental, economic and socio-cultural aspects of tourism development, and a suitable balance must be established between these three dimensions to guarantee its long-term sustainability (UNWTO, 2004).

By design, sustainable tourism is an industry committed to making a low impact on the environment and local culture, while generating income and employment for local people. Sustainability implies the protection and conservation of resources for future generations, as opposed to current unconstrained depletion (Pizam, 2010). The aim of sustainable tourism is to ensure that development is a positive experience for all stakeholders, such as the local people, the tourism companies, and the travelers and

vacationers to whom products are geared for. In this way, sustainable tourism may take into account the culture, politics, and economy of the community and country in a multitude of aspects. The UNWTO (2004) suggests that stakeholders should incorporate the following course of action as the guiding principles of sustainable tourism:

- Make optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural heritage and biodiversity.
- Respect the socio-cultural authenticity of host communities, conserve their built and living cultural heritage and traditional values, and contribute to inter-cultural understanding and tolerance.
- Ensure viable, long-term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed, including stable employment and income-earning opportunities and social services to host communities, and contributing to poverty alleviation.

In the context of sustainable beach tourism, Myles (2009) suggests that the custodianship of the coastal and marine environment is a global imperative:

Beaches are a key tourism attraction for destinations around the world... In terms of their geomorphology, beaches are considered the most dynamic environments on earth. Successful beach tourism provides a destination with a huge competitive advantage, but it requires robust partnerships across stakeholders to protect the natural resource and use it in the most sustainable way. Clean water and safety features are the two key critical success factors for successful beach tourism development and promotion (Myles, 2009).

As aforementioned, successful sustainable tourism requires the informed participation of all relevant stakeholders. On one hand, the development of sustainable tourism needs strong political leadership which can ensure wide participation and consensus building through the constant monitoring of impacts as an incessant process, along with introducing the necessary preventive and corrective measures; on the other hand, sustainable

tourism needs to maintain a high level of tourist satisfaction and ensure a meaningful experience to the tourists, raising their awareness about sustainability issues and promoting sustainable tourism practices amongst them (UNWTO, 2004; 2010).

Tourism and coastal resources in Thailand

At the time of writing, there was no research literature building the connection between ICZM and surf tourism in Thailand, save for preliminary studies by the author (Martin & Assenov, 2008; Martin, 2009; Martin, 2010a).

The World Bank (2006) reported that the exploitation of Thailand's marine and coastal resources during the past four decades has harmed the environment and affected livelihoods. While the Royal Thai Government, local community groups, and NGOs have undertaken measures to protect and rehabilitate natural habitats, more effective administration and greater cooperation among key stakeholders is needed to ensure a sustainable management of these resources to protect and conserve them for current and future uses. Marine and coastal resources under pressure from tourism are outlined in Table 1.2.

Table 1.2 Environmental Impacts from Tourism on Coastal Habitats in Thailand

tourism-related activities and events	environmental impacts
changes in freshwater runoff and sedimentation from construction and development.	increased salinity levels impact mangroves; increased sedimentation rates degrade mangroves, sea-grass beds and coral reefs.
harbor maintenance and boat anchoring.	destruction of submerged and fringing vegetation; damage to coral reefs from anchors.
increased freshwater demand.	water shortages and increased groundwater usage, possibly resulting in land subsidence and increased erosion.
increased waste generation, sewage, and wastewater disposal.	pollution of near-shore waters.
land clearing for construction.	damage or loss of wetlands, mangroves, and other coastal habitats.
overfishing to supply restaurants.	unsustainable fishing practices.
placement of buildings and other structures on the beach or in coastal waters.	changes in sedimentation patterns increase erosion and elevate risks during natural disasters.
sand mining for beaches and construction.	increased erosion in other areas.
walking and collection of souvenirs (e.g., on reefs).	physical damage to reefs and removal of organisms beyond sustainable limits.

Source: Adapted from Thailand Event Monitor (2006)

Coastal Resource Management in Thailand

Lemay and Hale (1991) note that coastal resources in Thailand are a part of the natural resource base that is supporting the economic development now taking place in Thailand's coastal zone. A significant quantity and scope of research is available on coastal resource management in Thailand, and the researcher was able to locate hundreds of academic papers and related materials, especially those addressing the aftermath of the 2004 Indian Ocean tsunami. Given the breadth and depth of this body of literature, the review presented herein is only an introduction to related issues and topics pertaining to the historical background and general management of coastal resource management in Thailand.

United Nations Environment Programme (UNEP, 2005) identifies that coastal zone management in Thailand was first attempted in the 1980s with the establishment of the Coastal Development Division under the Department of Land Development. Lack of guidance on how to integrate the work of the division with the other government agencies, however, led to closure of the division (*ibid.*). Meanwhile, major developments have taken place in the coastal areas, making coastal zone management more a tool for resolving land use conflicts than a tool for holistic planning that takes into account the needs of all stakeholders (*ibid.*). At the time of writing, classification of coastal areas in the context of coastal management in Thailand is somewhat precarious as jurisdiction of areas may overlap alongside ongoing issues for the planning, legislation, administration, and governing of specific areas. In 1993, marine national parks were delineated from terrestrial national parks (Marine National Park Division, 2002). At the national level, areas are widely classified as Marine National Parks (MNPs), Marine Protected Areas (MPAs), and Biosphere Reserves. Furthermore, status of these areas may range from those which are official, to those which are operational, to those being 'proposed' or in a state of 'surveying' (Setapun, 2001).

The Andaman Coast

The Andaman Coast has been a dynamic focus for academic research and discussion for some time. Subject matter includes, but is certainly not limited to, tourism development, industrial development, fisheries, aquaculture, water quality, environmental degradation, pollution, coastal erosion, mangrove deforestation, tin mining, and the 2004 Indian Ocean tsunami. In a wide sense, the literature reveals three destructive events in Thai history related to environmental degradation on the Andaman Coast: two were a result of

human activity and one was a result of natural calamity. The former were tin mining which degraded seawater quality and damaged coral reefs in Thailand (Ruyabhorn and Phantumvanit, 1988; Changsan, 1988; Wolkersdorfer, 2005) and tourism (World Bank, 2006; SEPF, 1988); the latter was the 2004 Indian Ocean tsunami.

Tin mining and tourism

Tin mining on the Andaman Coast took place on land and at sea and has been cornerstone to the regional economy for hundreds of years. In the advent of tourism in the region, Tisdell et al. (1992) suggest that probably the single most important tradeoffs in Phuket is that between the tin and tourism industries. The study identifies that the supply curve of tin from Phuket is relatively elastic, while that of tourism is correspondingly inelastic (*ibid.*). This is to say that comparably, converting an area from tourism to tin mining requires less time and energy than it takes to convert a tin mining area into a tourism area. In contrast, the Laguna Phuket resort complex (a cluster of seven hotels) at Bang Tao, Phuket represents that it is indeed possible to revive a polluted mining area for tourism.

Coastal and maritime tin mining

While a number of techniques were employed to extract tin from the land, maritime tin mining was especially distinctive to the Phuket and Phang Nga coast. Primarily, three types of mining vessels were engaged: large bucket dredges, suction dredges, and the much smaller driver-guided suction boats which were modified from fishing boats and used in the exploitation of near-shore deposits (Changsan, 1988).

Discussion on near-shore maritime tin mining and related effects on water quality on Phuket and Phang Nga provinces is somewhat unique to the region given that the first tin mining operation in the world to use marine vessels for dredging ore from the sea bed commenced in Phuket (when Captain Edward Thomas Miles invented a tin mining boat in 1909) (Sukavaj, 2008). Between 1975 and 1985, the tin mine economy stagnated into a negative growth rate, yet in 1985 there were still 513 tin mines and 183 tin/tungsten mines in Phuket (SEPF, 1988). Changsan (1988) reports that in 1981 there were 6,000 driver-guided suction boat operating on the Phang Nga Coast (see Appendix G). With the decline of the mining sector, the government began to look at tourism as an alternative viable source of income. As early as 1973 the Tourism Authority of Thailand

(TAT) announced plans to develop Phuket into a major center of tourism (Sukavaj, 2008), essentially shifting the economy of the island from tin to tourism.

Coastal resource and tourism in Phuket in 1988

In January 1988, the Socio-Economic Policy and Forecasting Unit (SEPF) at Chulalongkorn University completed an in-depth study on coastal resources and tourism in Phuket for Thailand's Office of National Environment Board (NEB). The study surveyed the littoral of Phuket with consideration toward the implementation of tourism planning and infrastructure as a substitute for a previously critical economy, namely tin mining. Fisheries (including aquaculture) and agriculture (mainly rubber, coconut, and pineapple) were found to be complimentary to tourism inasmuch as they provide seafood and produce for hotels and restaurants on the island.

Of significance to the current research, the Chulalongkorn University report classifies the various types of coastal resources in Phuket as "the beaches, islands, capes and bays and the fishing sites" (SEPF, 1988). Discussed in the context of tourism, the SEPT study assesses the coastal resources of Phuket from geographical, spatial, and logistical points of view, while placing the leading prospects for development alongside beach safety and environmental issues. Coastal ecological issues include water quality, sources of pollution, coral reefs, and conservation; beach issues include crime and hazardous ocean conditions (*ibid.*).

In 1988, surf tourism *per se* had yet to be recognized as a market segment in tourism literature, thus the SEPF report makes no mention of the sport whatsoever; rather it describes and discusses surf beaches, such as Surin Beach as, "too steep and too rough during the adverse climated conditions (*sic.*) to ensure safe swimming and ocean activities" (SEPF, 1988). Although the report identifies Surin Beach as "not very suitable for any water activities" due to a history of documented drowning, it does bring to light the inherent safety issues at Phuket surf beaches during the monsoon season when waves are most frequent. Safety issues are a reoccurring theme in the SEPT literature alongside issues of beach littering and pollution. Similarly, Martin (2009; 2010a) identifies issues of safety, litter and pollution in the Thai littoral as a negative impact on surf tourism. The SEPF (1988) asserts that littering on the beach through carelessness is one of the causes of beach pollution. In addition, the problems associated with waste disposal at hotels, bungalows, and restaurants are acknowledged.

The 2004 Indian Ocean tsunami and coastal research

The level of devastation in the six Andaman provinces varies significantly depending upon a number of natural parameters including bathymetry, slope, elevation and presence of natural barriers, as well as man-made factors such as coastal land-use and development. In account of the whole host of factors behind the magnitude of the tsunami-related damage in Thailand, the United Nations Environment Programme (UNEP, 2005), suggests that if anything positive can be gained from the disaster, it is clearly the opportunity it offers for Integrated Coastal Zone Management (ICZM). The tsunami event is behind a considerable growth in research focused on the Thailand's Andaman Coast (see the forthcoming section regarding international organizations operating on the Andaman Coast in 2010). In regard to mental health, research in coastal areas indicates that among tsunami survivors in southern Thailand, elevated rates of symptoms of post-traumatic stress disorder (PTSD), as well as anxiety and depression, continued among individuals and communities in the region long after the event (Griensven, et al., 2006; Thienkrua, et al., 2006).

Coral reefs and other coastal resources

Widespread damage to Andaman coastal reefs occurred as a result of the 2004 Indian Ocean tsunami. However, well before the tsunami the depletion of coral in Thailand had been occurring. Causes included pollution from tin mining and other sources, hotel construction, and private and commercial coral collection. Imposition of legal control measures were enacted in the 1980s by the Thai authorities to curtail the coral trade, yet the SEPF (1988) reported that "backdoor trade" in corals, on both small and large scale, continued.

Lemay and Hale (1991) note that baseline studies in 1988 indicate Thailand has lost extensive and valuable coral reef areas during the previous two decades with serious and negative implications for fisheries and tourism, suggesting that coral reefs have scenic and recreational values which are subject to heavy tourism pressures. One of the major anthropogenic causes is increased tourism activities, which have resulted in localized cases of disturbance and damage to coral reefs. Seenprachawong (2002) considers that damages to coral reefs are caused by man as well as by natural forces.

Through measuring the ratio of live to dead corals in the Andaman Sea, The World Bank (2006) reported while 5% were in an excellent state, 12% were good,

33% fair, 27% were bad, and 23% were very bad. This suggests that 50% of the reefs are in a bad to very bad state.

Thailand's foremost coastal resources are fisheries, mangrove forests, sea-grass beds, and coral reefs. In the past decade, largely due to uncontrolled economic activities, all of these have come under the threat of degradation or depletion. For example, between 1961 and 1993, Thailand's mangrove forests were reduced from 367,000 hectares to less than 168,500 hectares when these areas were converted to other uses, such as mining, settlement sites, ports and roads, salt ponds and most significantly, marine shrimp aquaculture. Fisheries on the Thai coast include those which are offshore, those inshore, and the aquaculture projects occurring on land (ibid.).

As aforementioned, the literature on Andaman coastal resources is prolific and this is due in part to the 2004 Indian Ocean tsunami. The World Bank (2006) prepared a detailed report on the status, trends, pressures, institutional capacity, and challenges regarding the management of coastal resources of greater Thailand. Tables 1.3 to 1.5 offer an overview of the many issues faced in CRM planning in Thailand.

Table 1.3 Coastal Resources of Thailand: Pressures

context	demands on coastal resources
extractive industries and sand mining	mineral mining and oil and gas production are important uses of natural resources for Thailand; effective pollution control for all extractive industries is needed; sand mining needs to be monitored to avoid increased erosion.
fisheries and aquaculture	fish stocks are not managed sustainably; total catch in Thailand has grown the least compared to other countries; catch per unit effort is decreasing while the amount of trash fish per catch remains high; shrimp farming needs effective management and monitoring.
illegal activities	illegal and unregulated activities represent significant losses and pose a threat to the sustainable management of resources.
marine transportation	the number of ocean going vessels is increasing; port operations and marine transportation continue to be sources of pollution, including from the coating on vessels, the transportation of invasive species, and accidents resulting in oil spills.
population and economic growth	thirteen million people, nearly a quarter of the Thai population, live in the 22 coastal provinces (not including Bangkok); economic and population growth in the coastal provinces are higher than the national average; manufacturing is a major industry and has grown rapidly over the past five years.
tourism and recreation	tourism in the coastal areas continues to grow and revenue is substantial (10 percent of the national GDP stems from tourism and supporting industries); environmental impacts, however, are also substantial and need to be addressed; tourism revenue may be used for environmental protection.
urban and industrial development	development has led to increased demands for freshwater and urban and industrial waste; reliable data on waste generation and treatment are needed.

Source: Adapted and modified from World Bank (2006), Thailand Environment Monitor

Table 1.4 Coastal Resources of Thailand: Status & Trends

resource	current status and trends
climate change	global climate change and a resulting rise in sea level are expected to have a strong impact on Thailand's coastal areas; Bangkok is a hotspot area.
coral reefs	over 80 percent of reefs along the Andaman Coast and over 50 percent of reefs along the gulf of Thailand are in a "fair", "bad" or "very bad" condition and are at risk of continued degradation.
endangered species	dugongs continue to be killed for meat or die as a result of inappropriate and destructive fishing practices; dugongs, whale sharks and sea turtles need stepped up protection and law enforcement.
erosion and natural hazards	each year, 600 kilometers of coastline experience erosion levels greater than one meter; erosion is causing a loss of land and utilities and affecting local communities; natural hazards also frequently occur and can cause severe damages.
fisheries and aquaculture	Thailand's productive coastal habitats play important roles in the fisheries sector and for coastal aquaculture; in 2003, marine fisheries catch was 2.7 million tons and coastal aquaculture was 0.7 tons, together worth about THB 112 billion; the production of aquaculture has been growing, shrimp farming has reached its area limit, and marine fish stocks are under threat.
freshwater supply	freshwater in the coastal areas is limited and average water demand in most regions exceeds average water storage; the use of groundwater as a freshwater source needs to be carefully monitored to avoid land subsidence.
mangroves	the decline in mangrove coverage, mainly a result from the conversion of mangroves to shrimp farms, has stopped; replanting efforts are ongoing, but the biodiversity value of replanted areas remains unknown; overall status of mangroves in Thailand is better than in other countries in the region.
sea grass beds	sea grass beds in Thailand remain healthy; local threats remain.
water quality and beaches	water quality in select locations is degraded or severely degraded and red tides are yearly events in Thai waters; beaches in general are in good condition.
wetlands	coastal wetlands are under threat; special protection is granted to ten coastal RAMSAR sites

Source: Adapted and modified from World Bank (2006), Thailand Environment Monitor

Table 1.5 Coastal Resources of Thailand: Institutional capacity

institutional context	capacity and management
coastal and marine area management	where designated, thailand's marine protected areas are managed reasonably well; only about 6.8 percent of all reefs, however, are under good mpa management.
community partners	communities increasingly play a role in the management of resources. especially in the south, community organizations, civil society organizations, and ngos are active partners for resource management.
financial resources	budget allocations are complex; potential exist for the use of economic instruments.
national and sector policies	overlapping and outdated policies and regulations remain the barrier for effective implementation of an integrated management approach; coordination among agencies is needed.

Source: Adapted and modified from World Bank (2006), Thailand Environment Monitor

Significant challenges faced by Thailand include preventing coastal erosion, establishing sustainable fisheries, stepping up the oversight and monitoring of development activities, increasing local capacity and participation, and strengthening the institutional framework to establish integrated management (ibid).

International organizations operating on the Andaman Coast in 2010

The 2004 Indian Ocean tsunami was an unprecedented event which affected Andaman coastal resources as never before anticipated; it also brought the establishment of a new and progressive era for coastal resource management and the coordination among stakeholders to the Andaman Coast. The Thai government, along with governments and non-governmental organizations (NGOs) from around the world began to assess the damages, study the effects, launch new programs aimed at conservation, and develop new policies and funding strategies. In this context, the impact of the tsunami was not only on the physical environment; it also impacted institutional establishments. International aid organizations involved in coastal resource management in post-tsunami Thailand include but are not limited to the following examples listed in Table 1.6.

Table 1.6 International CRM Organizations Operating on the Andaman Coast

Acronym	Organization
AFD	France Development Agency
AUSAID	Australian Cooperation Agency
BOBLME	Bay of Bengal Large Marine Ecosystem Project
CHARM	Coastal Habitats and Resources Management
DANIDA	Danish Cooperation Agency
GTZ	German Cooperation Agency
IRD	French Research Institute (Cooperative w/Chulalongkorn University)
IUCN	International Union for the Conservation of Nature
SAMPAN	Strengthening Andaman Marine Protected Areas Networks
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
WWF	World Wide Fund for Nature

Source: Author

Thai coastal resource management organizations

Placed under the jurisdiction of various Thai ministries, key organizations involved in the discussion on coastal management in Thailand include but are not limited to the examples shortlisted in Table 1.7.

Table 1.7 Shortlist of Thai Governmental Bodies Linked to CRM

Acronym	Organization
CORIN	Coastal Resources Institute (Prince of Songkla University)
DMCR	Department of Marine and Coastal Resources
DNP	National Park, Wildlife and Plant Conservation Department
DOF	Department of Fisheries
NAREBI	Natural Resources and Biodiversity Institute
NEB	National Environmental Board
ONEP	Office of National Environmental Policy and Planning
PMBC	Phuket Marine Biological Center
TAT	Tourism Authority of Thailand

Source: Author

The Ministry of Natural Resources and Environment oversees a number of departments related to CRM in Thailand. Milintawisamai (2000) provides four organizations under the jurisdiction of the ministry which are broadly responsible for coastal resource management. Table 1.8 outlines the roles of the governmental branches related to CRM.

Table 1.8 The Ministry of Natural Resources and Environment and CRM

department	area of responsibility
Department of Environmental Quality Promotion	promote the value and significance of conservatory nature in conservation area and environmentally protected area and conduct research to protect environment and conserve natural resources
Department of Marine and Coastal Resources	formulate and amend managerial policy and planning in order to perform marine and coastal resources rehabilitation and conservation for sustainable uses; encourage research on marine and coastal resources in order to support conservation and rehabilitation including those are rare and endangered flora and fauna
Office of the Natural Resources and Environment Policy and Planning	propose conservation areas and environmentally protected areas to the National of Environment Board; collaborate in the development of the Natural Environment Conservation Plan; and report on the Natural Environment Conservation Plan development
Pollution Control Department	Investigate and control the quality of environment in the study area. Follow up and investigate activities that may impact on the environment

Source: Adapted from Milintawisamai (2000)

Mapping coastal resources

Mapping coastal resources is inherent to the ICZM process; it is at the core of the documentation and assessment of the resources in question. At the time of writing, a number of organizations, including governmental and non-governmental, employ map making and Geographic Information System (GIS) in the ICZM process. According to the National Oceanic and Atmospheric Administration (NOAA, 2009), spatial representations of coastal issues, namely maps, have long been a critically important tool for CRM. Maps allow for a clearer understanding of an endless variety of coastal issues from population growth to sea level rise to ways that people use coastal resources for recreation and livelihood (ibid.).

CRM agencies often specialize in organizing and depicting spatial information through the use of a Geographic Information System (GIS). The Geo-Informatics Center of Thailand suggests for the implementation of integrated coastal zone management (ICZM) in Thailand to undertake an “overall stocktaking to analyze which major actors, laws, and institutions influence the management of our coastal zone”; and recommends to place ICZM in the context of systematic geography through the use of cartography, GIS and remote sensing (Yumuang, 2010). For example, the Pollution Control Department of Thailand (PCD) has developed comprehensive and operational coastal environment database which serves as a foundation for the classification of coastal environment information in GIS. This allows for the department to collect and collate the existing coastal environment data within the department and from other organizations, and to analyzing how these bodies integrated with each other and identify the gaps, overlaps and opportunities (Tridech, Simcharoen & Chongprasith, 2000).

Cartography and GIS are tools to address environmental problems, pressures and threats to the natural resources and environments of the coastal zone, including social and economic characteristics (Yumuang, 2010). NOAA (2009) put forward the concept of ‘participatory mapping’, whereby individuals, communities, non-governmental organizations, and the government are encouraged to engage in the coastal mapping process. Participatory mapping is tool that can simultaneously serve to create opportunities for stakeholder participation, capture important new information, and help participants make better coastal management decisions; it recognizes the benefits of local and indigenous knowledge sources (ibid.).

1.2.2 Surfing Thailand in the Literature

The following is a review of the literature related to surfing in Thailand. Preliminary searches conducted by the author in 2006 indicated that published literature on surfing in Thailand was particularly limited. Therefore, the researcher formerly set out to locate anything at all written on the topic, published or otherwise. Approximately seventy-five percent of the current and extant literature was written or published during the three-year course of study encompassed in this thesis. In the absence of complete literature on surfing in Thailand, each source was of some significance, and it is in this context that this short literature review on surfing in Thailand is framed. Identifying that surfing in Thailand is a somewhat novel and twenty-first century phenomenon, this review serves as a record, as referenced in the literature and media, for future research on the development of recreational surfing and surf tourism in Thailand.

Locating the literature

The methods to locate the literature were comprehensive. First and foremost, the researcher searched the internet each week from April 2007 to January 2010 using any number of key words and search strategies. Secondly, the researcher reviewed local newspapers. Thirdly, communication with Thai and foreign resident surfers was carried out in order to locate relevant literature. In this way, this short research serves to achieve the history and collective knowledge of surfing in Thailand as identified in the literature retrieved from two broad areas of the media: published and unpublished printed materials, and those found on the internet, namely the electronic sources. The former is listed in Appendix B, Annotated Chronology of Surfing Thailand Literature; the latter is listed in Appendix C, Online Resources for Surfing in Thailand.

The researcher is connected to the development of the literature in three ways: (1) primary author of the extant academic literature for surfing in Thailand (Martin & Assenov, 2008; Martin, 2009; Martin, 2010a, b); appearance as a subject in the literature (Riku, 2008; Fein, 2010); and (3) the primary source of various press releases in the electronic media in service to the Phuket Boardrider's Club.

The following is a moderately exhaustive listing on the published and unpublished literature on surfing in Thailand. Although other works do exist, the researcher was yet unable to locate them at the time of writing. The forthcoming description of the literature serves as a chronology, beginning with the oldest works and ending with the most

recent. In order to keep the concise nature of this listing, scattered mentions related to surfing that appeared in *The Phuket Gazette*, *The Nation*, and *The Bangkok Post*, among others, have not been listed as these articles were mainly press releases from the local surf clubs announcing dates or the results of the local surf contests. However, at the researcher's discretion, one article from the Andaman Post and one article from the Phuket Gazette have been included for review.

Milestones in the literature

Thompson (1991) was first to propose exploring and evaluating the surfing potential of Thailand as a new tourist resource, suggesting to “open up areas for surfboard riding in Thailand.” The Australian surfer and water sports retailer's unpublished proposal submitted to the TAT office in Phuket marks the first mention of surfing and surf tourism in the literature. The proposal was to be a cooperative effort with *Sawadee* magazine in 1992.

Some 15 years after Thompson's 1991 unpublished proposal came the first informative magazine article to illustrate Phuket surfing history. The article *Soul Surfer* was published (in Thai) in the April edition of Bangkok's MARS (2006) magazine. As the first published magazine article on surfing in Thailand, MARS (2006) marks a genesis for surfing in Thailand in the media. Prior to the MARS piece, the Andaman Post (2003) had an article on the Phuket Boardrider's Club, and Warshaw (2005) offered a short yet detailed description on surfing in Thailand and its history.

In 2007 and 2008, international surf travel media companies produced articles on surfing in Thailand, and both Japanese and American writers came to Phuket. Japanese surf magazine “On the Board” (2007) published *Surf in Thailand* featuring sharp images Japanese surfers on Thai waves and “Nalu” Magazine (Riku, 2008) published a lifestyle article on two contemporary Phuket surfers, Kata Beach local Jumnong Tongooni and Hawaii surfer and Phuket foreign resident Steven Martin. In contrast to these Japanese articles, Kew (2008) offers a much different image surfing in Thailand for the California-based and globally marketed surf magazine “Transworld Surf.” In line with the new age style of Transworld Surf Magazine, the article reports the oddities of the Thai surf tourism experience, citing inevitable encounters with monsoon rains, stormy seas, tsunami warnings, airplane crashes, transsexuals, and prostitution.

In 2008, surf tourism was officially recognized in Thailand with the booklet *Surfing in Phuket* published by the Tourism Authority of Thailand (TAT). The

twenty-six page professionally-photographed booklet is a milestone in terms of a publication on surfing in Thailand; it is an acknowledgment that the surfing craze has hit Thailand “with a punch” (TAT, 2008).

Martin and Assenov (2008) and Martin (2009) offered the first peer-reviewed academic study on surfing in Thailand. *Beach & Coastal Survey: What Future for Surf Tourism in Thailand* is an exploratory research assessing Thailand’s coastal condition and resource in the contexts of surfing and surf tourism, and included a study on surf tourist activity at Kata Beach through personal interviews (Martin & Assenov, 2008). Martin (2009) followed with *Re-thinking the Monsoon: Sustainable Surf Tourism in Thailand*, offering interdisciplinary perspectives on the scope of physical and cultural resources for surf tourism in Thailand alongside identifiable social and environmental issues. This research included observations on water quality and an analysis on the beach trash carried ashore during the southwest monsoon.

The Greater Phuket Magazine has published three articles promoting surf tourism in Phuket spotlighting the sport, and selling it as adventure tourism (Gow, 2008; Hesse, 2008; Sarmkast, 2009). In “Catching the Wave,” Gow (2008) brings to light the increasing popularity of the sport with a fun in the sun approach, yet significant to the safety issue to be discussed in this thesis, the article mentions that many tourists arriving in Phuket are unaware of the surf and suggests that novices take surf lessons and warns of “unbelievably strong currents”(ibid.). In “Extreme Sports,” Hesse (2008) promotes adventure tourism along the Andaman coast and includes one page on how/where to take a surf lesson in Phuket. In the following year, Sarmkast (2009) provides a cover shot of Quiksilver’s Jake Patterson doing ‘radical’ maneuver. And although the cover shot marks the first time for surfing in Thailand to be on the cover of an independent travel magazine, and the first time a professional surfer to be on the cover of a Thai magazine, the magazine offered no literary content on surfing.

The inclusion of Thailand in the “2009 Stormrider Guide Volume Three” is a definitive moment for surfing Thailand in the literature; it is a clear indication that surfing in Thailand is recognized by the international surfing community. The surf guide provides the attributes and conditions of the Andaman coast (see Table 1.9) and the following synopsis:

About 500km (310mi) from the Andaman & Nicobar islands, Thailand’s west coast, south of Ranong, boasts the

best potential and considering the WSW dominant swell direction and the shadowing effect of Sumatra, there is obviously more swell potential to the north. However, wind exposure and coastal topography forces most surfers south towards Phuket. SW groundswells can squeeze through the gap between Great Nicobar Island and the northern tip of Sumatra. During the SW monsoon, 6ft seas are typical with many rain squalls. The surf is a combination of windswell from storms in the Andaman Sea and groundswell from the Southern Ocean. It's actually quite consistent during the monsoon, with 2–4ft (0.6–1.2m) almost every day from June to September. The northern Andaman Sea is influenced by an upwelling process that brings in high saline waters. Tides are semi-diurnal with spring heights of up to 2.4m (8ft) and neap data down to 0.9m (3ft) (Sutherland, 2009).

Table 1.9 Thailand Surf Characteristics

SURF STATISTICS	J	F	M	A	M	J	J	A	S	O	N	D
dominant swell	-		SW -W		SW -W		SW -W		SW -W		-	
swell size (ft)	0		1		2		2-3		1-2		0	
consistency (%)	0		10		50		60		30		0	
dominant wind	NE -E		NW -NE		SW -W		SW -W		SW -NW		NE -E	
average force	F3		F2-F3		F3-F4		F3-F4		F3		F3	
consistency (%)	58		44		45		45		59		44	
water temp (C)	27		27		29		28		28		28	

Source: Adapted from Sutherland, Ed. (2009)

Over the years there have been several dozen mentions on surfing in Thailand in the *Gazette*, mostly related to the surfing contests. In 2009 the newspaper took a leading role in reporting on the surfing contests, including on-camera interviews with Quiksilver representatives Paul Hutson and Jake Patterson which were aired in their TV programming. The Phuket Post has had articles on the surfing contest in recent years, but not to the extent of the Phuket Gazette. In 2009 they published several articles following the success of Anissa Flynn in the girls division of the Thai Surf Series.

The publication of the Thailand Surfrider Magazine marks the debut of Thailand's first-ever surf magazine. The magazine includes an article titled *Coastal Resource and Surfing in Thailand* (Martin, 2010a), which investigates coastal resource issues surrounding surfing, including beach trash and the conservation of surfing areas; the magazine offers a surf guide and advertisements from global surf clothing manufacturing companies. The release of the magazine may indicate a new page on the development of surfing in Thailand.

The April 2010 edition of The Phuket Gazette feature story "Surf's up, drownings down, as low season waves roll in" by Fein (2010) is a report on the water safety research by the author of this thesis, whereby interviews of a variety of surfers indicate that they regularly assist swimmers in the surf. The research specifies that surfers are rescuing swimmers during the surf season in Phuket. It is the first-ever research on the surf-related rescue experiences of Thai and foreign resident surfers, as well as surf tourists in Phuket (see Appendix D).

Contribution of the surfing Thailand literature

The researcher located 20 articles on surfing in Thailand and identifies that the growth in popularity of surfing in Thailand and the associated literature are hardly a decade old. These works represent the birth of a new body of literature, the 'Surfing Thailand' literature. In addition, the surfing Thailand literature can be included in the global surfing and surf tourism literature. The majority of the literature was produced in 2008 and 2009, and is definitively linked to travel and tourism. The surfing Thailand literature originates mainly from travel magazines, surf magazines, travel guides, and the TAT among others, and illustrates the novelty and commercialization of surfing in Thailand.

The three previous studies by the researcher are the only academically orientated research conducted on surfing in Thailand. After Thompson (1991), Martin and Assenov (2008) mark the second piece of writing to identify the potentialities of a coastal exploration for "surfboard riding in Thailand." Martin and Assenov (2008) and Martin (2009) were first to systematically undertake an exploration of the Thai littoral for surfing.

Notably, throughout the literature there is little mention of the safety issues associated with surf beaches (namely rip-currents and risk of drowning) and those inherent to the adventure sport of surfing, save for the study published in *The Phuket Gazette* by the researcher (Fein, 2010). Similarly, information on the type and quality of the surfing

environments is nearly absent in the literature (such as water quality) save for Martin (2009). Therefore, this review of the surfing Thailand literature circuitously identifies areas for further research, including the significance of the safety issues, the documentation of coastal surfing resources, and an overview of the wider physical environment.

Online resources for surfing in Thailand

The electronic sources are more eclectic than the aforesaid printed literature and a stream of surfing information has come out of Thailand through the internet. Generated primarily through the surf clubs themselves, an anomaly of articles in the web-based surf media followed the 2009 Quiksilver sponsorship of the inaugural *Thailand Surf Series*. Media releases were posted to prolific surf media companies, including but not limited to *Surflife*, *Surfers Village*, and *Global Surfers*. Essentially, surfing in Thailand was irreversibly put on the map for the global surf community. As a contribution to the knowledge of surfing in Thailand, the researcher has identified fifteen relevant electronic sources and provides insightful details for these media sources. Although the current research is focused primarily on the physical environment, the researcher identifies the social phenomena surrounding surfing and surf tourism in Thailand through attention to the electronic media in order to establish the eminent growth of the sport.

The Phuket Boardriders Club website offers club history, happenings, images, and surf contest news. This site has the club's mission statement and news archives of events, such as professional surfer Bethany Hamilton's visit in support of the 2004 tsunami victims, some of which were surfers or the family of surfers from Kalim Beach. Thai Surf Series (.com) was launched in 2009 by Phuket Boardrider president Chanin Aiyarak in favor of gaining support from the surf clothing manufacturer Quiksilver for all 3 surfing contests held in Phuket. Previous to the 2009 Thailand Surf Series, the Phuket Surfing Contest (.com) was the official 2007 and 2008 web site for the annual 'Phuket Surfing Contest' at Kata Beach headed up by surfer Wallop Nadon, president of the Kata-Karon Surf Club.

Saltwater Dreaming (.com) was the first web site dedicated to surfing in Thailand. Surin Beach surf shop owner and web site administrator Rick Gamble offers collective knowledge on specific surf sites including those on the Gulf of Thailand. At time of writing, this site offered the most information and descriptions of surfing areas in Thailand.

As of January 2010, a search for “Thailand” on the home page of global media company Surflife (.com) retrieved some 30 relevant press releases or information related to surfing in Thailand. The majority were sent out through the Phuket Boarders club to support the surf events and local surfers. As of January 2010, a search for “Thailand” on Surfers Village (.com) locates a half dozen press releases related to the Quiksilver 2009 surf events and the Thai Surf Series, while a search for “Thailand” on Global Surfers (.com) locates their surf spot guide for Thailand listing ten surf breaks as well as their forum with some 30 entries. The Wanna Surf (.com) atlas lists and describes 25 surf spots for Thailand and provides a brief introduction to the weather phenomena required to have waves in the Andaman. International surf forecasting company Magic Seaweed (.com) provides the surf report and forecast information for Phuket, including detailed seasonal conditions, tide data, and historic records.

Phuket Surf (.com) is a surf rental shop at Kata Beach which offers web site with board rentals and lessons given by local Kata Beach surf crew (the “Kata Krew”) and is a haven for many expatriates as a place to store their surfboards during the monsoon season. The Pakarang Surf Shop (.com), launched by Oregon surfer Matt Blauer, was the first website promoting the Kho Lak area, explicitly Laem Pakarang (Cape Coral).

A 2007 blog titled ‘Surfing Phuket’ contained original and detailed descriptions of surfing in Thailand, including information on the Gulf of Thailand. However, at the time of writing, this blog was no longer posted. In 2007, the definitive ‘Phuket.com’ added surfing to their information base and brought it up to the mark in 2009. Similarly, ‘Phuket.net’ has added several pages of general information on surfing in 2008.

Review of the online resources for surfing in Thailand

The online resources for information on surfing in Thailand discussed herein are not an exhaustive account; rather they were determined by the researcher to be the sixteen most germane resources. In review of the online information on surfing in Thailand, and through tracking news bulletins and current events in the media, the research identifies that most of the news is homegrown, and originates from the surfing clubs and contest marketing opportunities particular to Phuket. Linkages between the surf clubs and contest promotions with various local and international media companies are behind this observable fact. Furthermore, tourist information and news sites, such as Phuket.com, have

followed suit in adding surfing and surf-beach information with the obvious implication to promote tourism during the southwest monsoon season.

The web-based media has sparked considerable publicity for surfing in Thailand. Starting in approximately 2007, mentions of surfing began to appear on any number of travel and tourism web sites selling Thailand as a tourism destination. Notably, there is scattered information to be found on the internet of surfing in Thailand and in many cases it is repetitive. The media generated by the development of the 'Phuket Surfing Contest', the auspice and inauguration of the 2009 Quiksilver Thailand Surf Series, and the media linkages fostered by the Phuket Boardriders Club, have forged a new image of surfing in Thailand in the Thai and global media almost overnight. The review of online resources serves to document the development of this identifiably unique media regarding surfing in Thailand.

Other media on surfing in Thailand

Other existing relevant media on surfing Thailand are TV reports covering the surf competitions, including Andaman TV and the Phuket Gazette TV. There are also several DVDs circulating among local surfers which were produced by friends and supporters of the Phuket Boardriders Club. Some of this material was used to gain financial support to promote and manage the 2009 Thai Surf Series from the surf clothing company Quiksilver Inc.

Surf-related drowning in the press

With the search for the surfing Thailand literature on the internet came unanticipated and related topics, such as surf-related drowning in Phuket. Furthermore, articles appearing in The Phuket Gazette, The Nation, Bangkok Post, foreign newspapers, as well as on various websites (such as Phuketwan.com), blogs, and forums have offered discussion on surf-related drowning in Phuket. This literature and media served as impetus toward developing discussion on ocean safety and surf tourism. This has resulted in negative image of the surf season, and serious criticisms of tourism safety in Phuket. However, across the tourism websites which promote surfing in Thailand, there are few mentions of the safety issues associated with surf beaches (such as rip-currents and risk of drowning). The researcher identifies that there is a gap in the tourism media regarding safety at surf beaches.

1.2.3 Surf Tourism Research Literature

A surge in surf tourism research published in the recent decade and the need to investigate the background of surf tourism applicable to this research provides the impetus for the collection and review of relevant material. Surf tourism research literature is an outgrowth of research literature related to the activity of surfing framed by the discipline of tourism. Although surf tourism is a globally expanding market segment, very little is known about the field of study. Scarfe, Healy and Rennie (2009) suggest twelve overall categories of research-based surf literature: coastal management, physical processes, modeling, Artificial Surf Reef (ASR) Sediments, ASR design, ASR monitoring, ASR construction, surfers and waves, sociology, industry, economics/tourism, and biomechanics. Thus surf economics and tourism research are identified as a developing category the surf research literature.

The researcher proposes ‘surf tourism research’ as an independent field of study and located 67 related studies. Of practical intention, surfing literature conspicuous with the discipline of sociology and exclusive of tourism are not included. Similarly, surf research within the physical sciences is for the most part excluded, such as the body of research on artificial surfing reefs (the ‘ASR’ literature). However, the topic of surf break management, such as Scarfe, Healy and Rennie (2009), and Scarfe, Healy, Rennie and Mead (2009) have been included for discussion. The following literature review includes 67 pieces of research for analysis; it examines surf tourism through the eleven themes which serve to define the field in context to the current research:

- Defining the field of study
- The Mentawai Archipelago
- Surfing as a commodity
- Identifying the value of surfing
- Surfing as a coastal resource
- Graduate studies on sustainable surf tourism
- Water quality and surfing
- Conservation of coastal surfing resources
- Trend analysis of the research
- Interdisciplinary nature of the research
- Concluding thoughts and gaps in the literature

Defining the field of study

Among the earliest research conducted on surf tourism, Augustin (1998) explored the advent of surf-related sports on the French Atlantic, especially the development of surf resorts in the three southernmost provinces, which were attributed principally to an emerging trend in ‘freedom-loving activities’, and where surfing events are a key determinant spawned by the members of surf clubs and the synergies it inspired among the sponsors, the media, and the local communities. Augustin (ibid.) identifies the early development of surfing in France as a new sport activity recognized and supported in hospitality and tourism and viewed as a sure commercial bet given the driving forces of territorial dynamism, regional self-promotion, and the creation of a new image for coastal resorts. The study distinguishes that surfing events are corollary to the growth phenomena and are driven by surf clubs, corporate sponsors, media linkages, and especially in the case of France, supported by the regional government. Furthermore the research provides insight to four areas of surfing and town planning: 1) the tendency to create new seaside sites with the added impetus of surfing; 2) the surf resort concept; 3) the growth of surf clubs; 4) the significance of undeveloped and difficult to reach sites.

Fluker (2003) presented the significance of, and definition for, surf tourism in order to identify areas of further research. The study identified that as of 2002, extensive query for surf tourism research yielded no results. Consequently, Fluker (ibid.) consigns traveling for the sake of surfing onto a traditional concept of tourism to produce a definitive characterization for surf tourism:

Surf tourism involves people travelling to either domestic locations for a period of time not exceeding 6 months, or international locations for a period of time not exceeding 12 months, who stay at least one night, and where the active participation in the sport of surfing, where the surfer relies on the power of the wave for forward momentum, is the primary motivation for destination selection (Fluker: 6).

However, surf tourism was developing as a sub-discipline within other areas of tourism since 1999. As the field of surf tourism developed, studies have endeavored to define the field and its place in context with other aspects of tourism. For example, Orams (1999) provides the history and development of tourism in the marine

environments and mentions surf tourism as a relevant component of marine tourism, identifying that “Surfing has had a massive influence on the image of marine activities, and forms a world-wide recreational activity participated in by millions.” Orams (*ibid.*) notes that surfing extends well beyond the enthusiasm for the activity itself, having far-reaching influences as a result of image, surf clothing, and movies. In the context of sport tourism, Poizat-Newcomb (1999) examined the dynamics of surfing in Puerto Rico, finding that the sport provides stewardship and positive ties for the island’s history, economy, and developmental strategies; the study traces the evolution of surf tourism as a positive element within Puerto Rico, exploring the issues of conservation, ecology, territoriality, the dichotomy among surfers and boogie boarders, and the government’s limited attention to the market segment. Jennings (2007) offered discussion on fresh water and marine tourism with focus on boating, sporting, adventure, and sustainability, offering a market profile on surfing, noting that the sport of surfing is technologically driven in the vanguard of movements concerned with water quality. Buckley and Carter (2007) overviewed the surf tourism sector structure as a component of adventure tourism as segmented into eight categories: activity, equipment, accommodation, statistics, access, community, experience, and environmental management.

Buckley (2002a) marked a new page in the surf tourism research literature with an in-depth study into the Indo-Pacific region with a focus on surf tourism planning, management, and policy. Key issues identified include crowding at surf sites alongside the subject of quota and permit allocation. Through a case study on the Mentawai Archipelago, Indonesia, recreational capacity is assessed through field survey of the physical area by classifying surf breaks in conjunction with proposing cash flow scenarios, management systems, and potential investment of land-based resorts. The research identifies that prior to 2002, there had been very little practical or theoretical investigation into surf tourism and therefore research, analysis and insight were found to lag behind the growth and changes in the industry itself -- thereby establishing the significance of the surf sector in tourism research and development analysis.

Buckley (2002b) investigated the appearance of commercial surf tourism, bringing it into focus as an emergent and significant global industry, identifying that the impacts, including environmental, socio-cultural, and economic, depend on how particular islands manage their natural and human resources. The research found that client response to crowding, together with increased pressure on natural or cultural host environments,

provided an immediate and financially measurable indicator of capacity and such thresholds were generally low and could be reached very rapidly; it also identified that surf tourism destinations differ significantly in regards to relations between tour operators, local access to surf breaks, and approaches to capacity management. The study recommended ‘practical politics’ regarding capacity management of Mentawai surfing resources for both conservation and social welfare.

The Mentawai Archipelago

At the turn of the twenty first century, surf destinations in developing countries, such as the Mentawai Archipelago, Indonesia, which are rich in natural surfing resources, began to gain the attention of regional governments and the global media. This region has become among the most prolific surf tourism destinations and has become the most researched surfing location on the planet. In addition to the aforementioned studies, Ponting, McDonald and Wearing (2005) offered *De-Constructing Wonderland: Surfing Tourism in the Mentawai Islands, Indonesia* which showed that the distribution of wealth generated through foreign tourists accessing local resources is inequitable and unsustainable, such as foreign surf-tour operators, the media, and surf wear manufacturers not benefiting the local populations, governments, and NGOs. Ponting (2006) identified how the global surf media has rapidly transformed the economically depressed region of the Mentawai Archipelago, Indonesia, into the most desired surfing tourism destination on Earth with little regard for the host communities which are for the most part disconnected from the potential economic benefits.

Persoon (2003) explored the relationship between the logging industry, surf tourism, and the indigenous peoples of Siberut Island, Mentawai Archipelago, Indonesia and found that local communities have suffered from decades of mistreatment by outside forces, and that surf tourism may indeed be another chapter of such exploitation. Ponting (2009) discusses Indonesia’s Mentawai Islands in circumstance with identifiable stakeholders and land issues, politics and policies, allegations of corruption, and the management and licensing of tour operations amidst the boom of the regional surf tourism economy. Issues of carrying capacity management and land issues are discussed amidst the 2003 government legislation (called Perdah 16) to allow exclusive rights to tour operators (ibid.)

Surfing as a commodity

The ‘commodification’ of surfing is a reoccurring theme in the literature. From a sociological perspective, surf travel was portrayed as a lifestyle choice through early surf films and the media. Reed (1999) looked at the social construction of surfing in the contexts of commodification, gender, mobility, and nature in media depictions of the surfing lifestyle, offering a discourse on the history and meaning of surf travel in the framework of colonization, social resistance, and globalization of the surfing subculture. Through a critique of the film *The Endless Summer*, Ormrod (2005) identified surf tourism as emanating from California and spreading to the global stage, indentifying the commodification of surfing, particularly in the context of surf exploration, romance, and the youthful consumers. Buckley (2003) offered a study of the surfing industry which identifies sponsorship of qualified surfers as an effective marketing exercise which persuades customers to buy the sponsors’ products through high exposure in specialist magazines and websites.

Ponting (2007) identified surf tourism as a highly commodified global industry where management models may ignore local communities, citing that conflicts over the world’s best surf breaks have erupted between surf tourism entrepreneurs and destination communities. Ponting (2009) offered *Projecting Paradise: the Surf Media and the Hermeneutic Circle in Surfing Tourism*, which identified how the imagery of perfect un-crowded surf in paradisiacal tropical destinations has been the dominant theme in the surf media, exploring tourism demand through the symbolic elements of surfing tourist space, which drives a multi-billion-dollar global surf industry. Wearing and Ponting (2009) explored the contrasts among commodified and de-commodified tourism in the context of volunteerism, offering a case study of surf tourism in the Mentawai where on one hand high-paying surf tourists offer no support for local communities, and on the other hand volunteer tourists do a great deal to support local communities.

Identifying the value of surfing

The socioeconomics of surfing has emerged as a leveraging tool to recognize the value of surfing areas and for the protection of coastal surfing resources.

In support of the case for domestic tourism, Tilley (2001) evaluated the ‘Pleasure Point’ surfing area in Santa Cruz, California through ‘Travel Cost Modeling’, estimating how often, how long, and how far surfers travel, and how much money surfers

spend on surfing each year in order to provide the dollar value of the unique surfing areas in order to better recognize their benefits accordingly. Nelson, Pendleton and Vaughn (2007) published *A Socioeconomic Study of Surfers at Trestles Beach*, a study which characterized the domestic demographics, visitation patterns, and expenditures of surfers who visit Trestles Beach in San Clemente, California. The research identified that a considerable number of surfers used the area and contributed a surprising amount of revenue to the local community.

Lazarow (2007) identifies surfing as a major recreational and economic activity by exploring human interaction with coastal environs focused mainly on several locations in Australia. Similarly, Lazarow, Miller and Blackwell (2007) offered *Dropping in: A Case Study Approach to Understanding the Socioeconomic Impact of Recreational Surfing and its Value to the Coastal Economy* which explored the value of recreational surfing in Australia and the United States in order to improve decision making for coastal environments, especially in the context and need to consider negative impacts on surf breaks and the natural environment that may occur as a result of planning, development, and coastal protection works.

Additionally, Lazarow, Miller and Blackwell (2008) published *The Value of Recreational Surfing to Society*, a study centered on observed market expenditure and nonmarket valuation, describing the socio-economic value of surfing and demonstrating the significant economic, social, and cultural importance of surfing amenity alongside the need to consider negative impacts resulting from development or coastal protection works on surf breaks and the natural environment. The study introduced a typology of ‘surfing capital’ as a means of identifying market and non-market aspects of surfing areas and includes a wide range of physical and social categories. Table 1.10 identifies the interdisciplinary aspect of surfing capital.

Lazarow and Tomlinson (2009) recognize the significance of the Gold Coast beaches for surfing and other forms of recreation, including their significance as a coastal protection buffer between the highly urbanized land and the ocean, as a place of recreation for residents, as a regional tourism industry with vital economic importance to the city, and as a valuable environmental habitat.

Table 1.10 Typology of Surfing Capital

Item	Description	Natural or Human Impact
Wave quality	Dominant local view of how the wave breaks. Both beauty and physical form become assessable.	Construction of coastal protection/amenity structures (e.g., groynes, seawalls, piers, seawalls, river walls, breakwaters, artificial reefs)
Wave frequency	„Surfable“ waves measured against an accepted standard.	Sand management (e.g., beach fill, dredging, sand bar grooming)
Environmental	Environmental or biophysical conditions that may mitigate against a surfers“ physical health.	<ul style="list-style-type: none"> - Biological impacts (e.g., water quality or nutrient loading) -Climate change/variability (e.g., temperature change, sea level rise, less or more storms less or more often) -Amenity of the surrounding built and natural environment -Marine predators (e.g., sharks)
Experiential	Societal conditions surrounding the surfing experience.	<ul style="list-style-type: none"> -Legislation/regulation that might grant, restrict, or control access (e.g., community title, private property, payment strategies, craft registration, proficiency requirement, policing) -Code of ethics (i.e., road rules for the surf) -Signage & education strategies -Surf rage, aggression, intimidation -Self-regulation/localism/lore -Mentoring, sharing, physical activity, challenge, joy and laughter, well-being, community spirit self-fulfillment -Local aesthetic

Source: Lazarow, Miller, and Blackwell (2008)

In the context of international tourism, Pendleton (2002) explored the valuation of coastal tourism, including ‘slow tourism’ whereby expatriates may influence the market. Although focused on the hotel market, the research considers the draw factors to coastal Rincon’s tourism market, such as surfing, diving, and fishing. Murphy and Bernal (2008) recognized the impact of surfing on the local economy of Mundaka, Spain, as one of the region’s leading economic sources and the consequences of the partial destruction of the area’s best surfing destination resulting in the cancelation of international surf competitions and the discernible loss of tourism revenue.

In a brief research paper which identifies a series of studies on surf tourism in various countries around the world, *The Socioeconomics and Management of Surfing Areas: International Case Studies from Mexico, Spain, California and Australia*, Nelson, Lazarow, Bernal, Murphy and Pijoan (2007) offered evidence from three continents which indicated the rising popularity of surfing as an economic contribution to local communities, especially in regard to coastal management decisions and environmental conditions, such as

the negative impacts due to changes in water quality. With contributing authors from Surfrider Foundation and Save the Waves Coalition, the research marks a relationship between the not-for-profit sector and surf tourism research.

The value of surfing to the Australian economy has come to the forefront of coastal assessment studies, especially on the Gold Coast. For example, the AEC Group (2009) prepared *Surf Industry Review and Economic Assessment* for the Gold coast City Council which offered statistical information supporting surfing's economic contribution to the Gold Coast, identifying it to represent nearly ten percent of the local economy's total output. The study placed surf tourism at the forefront of the surf industry, ahead of wholesale trade, retail, and manufacturing. Similarly, Tourism New South Wales (2009) put forth the 2009 Tourism Authority Action Plan: *Tourism NSW's Action Plan to Consolidate the State's Position as Australia's Premier Surf Destination – Catching the Wave*, an action plan set up to capitalize on the region's competitive advantage and positioning as a surf tourism destination, presenting a market overview and segmentation, and identifying target audiences, strategic directions, capacities, and the economic implications of surf schools, surf events, and consumer engagement. The purpose of Tourism NSW's Surf Tourism Action Plan is to "consolidate the State's position as Australia's premier surf destination, increase its share of the Australian surf tourism market, and to assist in growing surf tourism to coastal regions" (ibid.). The research was built on previous Tourism NSW reports from 2007 and 2008.

Surfing as a coastal resource

Lazarow and Castelle (2007) produced a management research report called the *Kirra Wave Study* which investigated physical processes and options leading to the potential improvement of surf quality at Australia's Kirra Beach and the surrounding surf breaks whilst maintaining coastal integrity, especially in the consideration of surfing as a major recreational and commercial activity in the Gold Coast area which receives 75,000 visitors daily. The research explored the stakeholder engagement process (community, industry, and government), seeking to improve surfing amenity in the context of economic, management, and liability considerations (ibid.) The study was a reaction to a combination of engineering works which had altered natural coastal processes in the area and negatively affected how the waves break at the surfing site.

In a Master of Science thesis in oceanography/coastal zone management by Kelly (2008), *Coastal recreation values in Brevard County: Saltwater fishing and surfing*, Florida's economy was identified to have had strong ties to natural coastal resources, and while coastal ecosystems provided benefits to society, especially recreational opportunities, coastal values were not well understood. The study indicated that coastal management and public policy decisions should consider the total economic value of host ecosystems.

Green (2008) prepared the United Kingdom Government Corepoint report, which identifies the significance of the physical, ecological and socio-economic context and of area-specific activities, which reported on the human and physical environments of the Cornwall seaboard and offered insight for coastal management through exploring eleven beaches for water-based leisure activities, especially the carrying capacity for surfing and surf schools.

Scarfe (2008) presents the argument for the physical science behind coastal management of surfing areas and builds a case for surf break management and conservation, and although the term 'surf tourism' does not appear in the research, the case presented for the value, scarcity, and conservation of the resource using scientific data and steers the field toward the physical sciences. In *Sustainable Management of Surfing Breaks: Case Studies and Recommendations*, Scarfe, Healy, Rennie and Mead (2009) noted that as the social, economic, and environmental benefits of surfing breaks are realized, surfers are increasing integral to the integrated coastal zone management course of action. Scarfe, Healy and Rennie (2009) discussed the literature of surfing, especially as it relates to artificial reef and coastal engineering in the context of recreational surfing and coastal management practices in *Research-Based Surfing Literature for Coastal Management and the Science of Surfing – A Review*. As aforementioned, the research suggests twelve overall categories of research-based surf literature: coastal management, physical processes, modeling, artificial surf reef (ASR) sediments, ASR design, ASR monitoring, ASR construction, surfers and waves, sociology, industry, economics/tourism, and biomechanics. Thus surf economics, surf tourism, and coastal management research were identified as developing the category the surf research literature (ibid.)

Martin and Assenov (2008) presented *Beach and Coastal Survey: What Future for Surf Tourism in Thailand*, the first ever research on surf tourism in Thailand. The study centers on an independent coastal survey to discover and inventory Thailand's natural coastal surfing resources as the foundation for further surf tourism research. Martin

(2009) offered *Rethinking the Monsoon: Sustainable Surf Tourism in Thailand* which put forward an interdisciplinary approach to establishing the scope of physical and cultural resources for surf tourism in Thailand alongside identifiable social and environmental issues, namely water quality and safety issues (ibid.)

Slotkin, Chambliss, Vamosi and Lindo (2009) presented *Surf tourism, artificial surfing reefs, and environmental sustainability*, which places the discussion of surf tourism in context with the artificial surf reef (ASR) literature and ties surf tourism to coastal management in both physical and social science perspectives. Although the ASR literature was not included in the current literature review, it is inherently tied to surfing as a coastal resource and the protection and conservation of shoreline areas. ASR literature began in the mid 1990's and is continuative until today.

Graduate theses on sustainable surf tourism

Graduate studies related to surf tourism have contributed to the growth of the field of study through research in a number of disciplines. Much of research at the graduate level was thematically tied to the issue of sustainable tourism. The following eight graduate-level theses centered specifically on surf tourism are evidence to the call for sustainability and emergent issues in the decade-old field of study.

The first-ever master thesis on sustainable surf tourism was Ponting (2001); it was among the first research to study the issues surrounding the management of the Mentawai islands and to focus on the private tourism operators, the government, and the host communities involved. Exploring environmental, economic, and social dimensions, Ponting (ibid.) investigates a myriad of management issues faced by the region amidst 'neo-colonial' advances of the surf tourism industry in contrast with impoverished local communities; the research seeks to identify the stakeholders and to address the high levels of leakage of the economic benefits of surf tourism away from host communities.

In the research *Western Surf Tourism in the Traditional Fishing Village of Taghazout, a Sustainable Development?*, Hageman (2004) considered local residents and surf tourism in Taghazout, Morocco, exploring ecological, economical, and socio-cultural considerations spanning four decades. Hageman (2006) investigated pro-poor surf tourism on the Indonesian island of Lombok, indicating that although this unique market segment faces obstacles, surf tourists have a high level of spending on local products, as well as a dynamic concern for social and natural environments.

The 2004 master thesis *Sustainable Issues facing the Costa Rica Surf Tourism Industry* (Tantamjarik, 2004) examined the environmental, socio-cultural, and economic issues related to infrastructure, crowdedness, pollution, the government's role, local community involvement, and visitors experience, identifying that crowding and pollution as the most commonly cited concerns.

Krause (2007) completed a master thesis in anthropology: *Surf Tourism in Costa Rica: Anthropological Perspectives*, a study centered on touristic activity at Jaco and Hermosa beaches in Costa Rica, identifying that surfers are pathfinders into territories that lack an existent tourism infrastructure, and that they may indirectly set in motion a process of development and foreign investment into areas that are ill-prepared for large numbers of visitors.

Frood (2007) investigated the potential costs and benefits of surf tourism and discusses surf tourism as a possible contributing form of sustainable development for Indonesia. The research contributes an action plan for sustainable surf tourism in Indonesia in light of 'surf tourists scouring the globe' to relevant stakeholders and suggests the motivation for researchers and governments must be to find solutions for the sustainable development of surf tourism destinations (ibid.)

Mach (2009) explored the need for ecotourism principles in international surf culture, offering a history of surf subculture and surf tourism, recommending for the promotion of local protectionism in early surf tourism development by engaging stakeholders to understand that indeed they have a vested interest in protecting areas. The study suggest that sustainable development should shift from a strict environmental focus include a community focus whereby an informed civil society and social entrepreneurs are the keys to linking surfing tourism towards sustainability.

Several doctoral dissertations on surf tourism include Ponting (2008) *Consuming Nirvana: An Exploration of Surfing Tourist Space*, which explored the social construction of surfing tourist space in the Mentawai Islands through developing conceptual tools to ensure local communities are empowered to control their destiny as global surf capital extends its reach, including the ownership of property rights in the natural surf resources of waves and related tourism facilities. Ingersoll (2009) explored Hawaii's heritage in the field with *Seascape Epistemology: Decolonization within Hawaii's Neocolonial Surf Tourism Industry*, which collects oceanic literacy into an archive and argues that such epistemology is empowering for Native Hawaiians as it validates Hawaiian

ways of theorizing, conceiving and constructing knowledge in genealogical, cultural, political, and spiritual relationships with the sea, identifying the diverse aspects of the surf tourism industry in Hawaii.

Water quality and surfing

Water quality is a significant concern for surf tourism, appearing as a reoccurring theme in the literature. For example, Tantamjarik (2004) confers that sewage pollution, pesticides and trash leaching in Costa Rica is a waterway polluter and surfers feel a major concern about these because they pose health risks for marine life and ocean users. Litter on beaches was also noted as a problem (ibid.) Jennings (2007) discusses the example of *Surfers Against Sewage* (SAS), a not-for-profit organization founded by surfers who campaign for clean and safe recreational waters. Jennings (ibid.) identifies that the organization's use of media-catching images and proactive arguments based upon commissioned and published research has brought validity and success to conservation advocacy for clean water at surfing beaches. Nelson, Lazarow, Bernal, Murphy and Pijoan (2007) note that as surfers are fully immersed in the ocean, they are very particularly sensitive to changes in environmental conditions and coastal pollution and water quality can negatively impact surfing. Lazarow, Miller and Blackwell (2007, 2008), identify the relevance of environmental issues including water quality, such as the biophysical conditions that may mitigate against a surfers' physical health (see Table 1.6 regarding the 'Surfing Capital' schema as aforementioned in this literature review). Martin (2009) presents a case for water pollution issues in Thailand through interviews with surf tourists, reviewing the history of the tin mining industry, and by indentifying the sources of marine debris on Thailand's Andaman Coast through interviews with surfers and analysis of plastic bags.

Conservation of coastal surfing resources

Conservation of natural surfing resources has emerged in Australia with research including that of Hugues-Dit-Ciles, Findlay, Glegg and Richards (2005) *An Investigation into the Nature of Surfing Tourism and its Potential Environmental Impacts on Relatively Pristine Environments: Gnaraloo, Western Australia, a Case Study*. The study explored the development and management of surf tourism in wilderness areas and its potential impacts on the natural environment. Farmer and Short (2007) put forth

Australian National Surfing Reserves – Rationale and Process for Recognizing Iconic Surfing Locations, which provided background and examination for an Australian surfing reserve system based on the premise of surfing as an Australian cultural heritage and a means to long-term preservation of world-class surfing sites.

Trend analysis of the research

The author suggests that research can be framed into three periods: the early period (1997–1999); the formative period (2000–2006); and the progressive period (2007–2009). The early period (1997–1999) marks the first works which were largely descriptive, social science based, and identify surf tourism as a new field of research. Hall (1997) recognizes the significance of an international surfing competition on a rural community in Western Australia. Augustin (1998) discusses the development of land-based resorts around surfing in France while Poizat–Newcomb (1999a, b) distinguishes the early stage surf tourism development in Puerto Rico. Along with Reed’s discussion on the commoditization of surf travel (1999), the research carried out before the turn of the twenty-first century indicated that the global reach of surf tourism was eminent well before the development of academic inquiry into the field.

The formative period (2000–2006) defines the nature of the literature. Buckley (2002a, b) identifies that prior to 2002, there had been very little practical or theoretical investigation into surf tourism and therefore research trails well behind the growth and changes in the industry itself. Fluker (2003) offers a definition for ‘surf tourists’ and identifies areas for further research. Indonesia’s Mentawai Archipelago emerges as a key research location (Ponting 2001; Buckley 2002a, b; Persoon, 2003; Ponting, McDonald & Wearing 2005). Over a seven-year period field research was carried out in the Mentawai Archipelago, Indo-Pacific islands (which includes the Mentawai islands), the United States, South Africa, Puerto Rico, Morocco, Costa Rica, the United Kingdom, and Western Australia. Ponting (2000) collected primary data from the Surf Travel Company which provided Dolnicar and Fluker (2003a, b; 2004) with data for their subsequent quantitative studies. Ponting (2001) produced the first-ever master thesis on sustainable surf tourism management and Buckley (2002a, b) pinpointed surf tourism management as a key area of research. Thus during this formative period, surf tourism research expands across the globe and research by graduate students involve a variety of disciplines.

The progressive period (2007–2009) is identified by a flurry of research, both at the graduate level and at the journal level, with over half of the total literature being produced in just three years. In 2007 alone, 15 studies encompassing 12 countries were produced. In total, between 2007 and 2009, 36 studies were conducted and new areas of study emerge. This period is earmarked by socioeconomic studies (Nelson, Pendleton & Vaughn, 2007; Nelson, Lazarow, Bernal, Murphy & Pijoan, 2007; Lazarow & Castelle, 2007; Lazarow, 2007; Lazarow, Miller & Blackwell, 2007; Lazarow, Miller & Blackwell, 2008; Lazarow & Tomlinson, 2009) and the emergence of physical sciences in the discussion of surf break management (Scarfe, 2008; Scarfe, Healy & Rennie, 2009; Scarfe, Healy, Rennie & Mead, 2009). Farmer and Short (2007) proposed the conservation of surfing areas in Australia through the formation of ‘surfing reserves’ as protected areas in the government legislature.

The 2007–2009 period ushered a new era in graduate studies aimed at surf tourism, encompassing the completion of four master theses (Krause, 2007; Frood, 2007; Kelly, 2008; Mach, 2009) and two doctoral dissertations (Ponting, 2008; Ingersoll, 2009). Ponting (2008) produced the first ever dissertation dedicated to surf tourism which was centered on spatial and management issues; while Ingersoll (2009) offered an epistemological approach to Polynesian knowledge and the integrity of surfing (from a cultural point of view) as a base upon which ‘tourism’ is placed. In addition, Scarfe (2008) presents a dissertation defending the case for surf break management and conservation, and although the term ‘surf tourism’ does not appear in the research, the case presented for the value, scarcity, and conservation of the resource using scientific data and steers the field toward the physical sciences. These dissertations identify the interdisciplinary nature of the developing surf tourism field. The close of the century witnessed the first-ever comprehensive government action plan for the definitive promotion of surf tourism (Tourism New South Wales, 2009), an examination into recreational surfing and action plan for the eastern Australian province of New South Wales.

For the most part, the social science argument came in the early and formative periods, while the physical science argument came in the progressive period (ASR literature notwithstanding. ASR literature is among the earliest related research). Furthermore, the international tourism discussion came in the early and formative periods, while the domestic tourism argument came for the most part in progressive period, especially with valuation studies of surf sites and various government examinations and

assessments. Prolific topics in the literature include management, the valuation of surfing areas, conservation of surfing areas, and surfing events.

Interdisciplinary nature of surf tourism research

The literature reviewed herein reflects the interdisciplinary nature of surf tourism in context not only within tourism as a professional field, but within sociology, economics, and coastal studies in terms of ecology, environment, management, and conservation. From academic and developmental perspectives, as the research increased, it expanded in scope and crossed disciplines. This is identifiable at the graduate research level by the diversity of disciplines represented in an array of unpublished theses and dissertations, and in book chapters and academic journals, wherein surf tourism research includes the following fields of study: sport tourism, adventure tourism, marine tourism, water-based tourism, sustainable tourism, coastal tourism, tourism marketing, tourism management, recreational management, travel industry management, coastal zone management, and tourism planning. Disciplines of study include urban and regional planning, human geography, anthropology, economics, sociology, socioeconomics, ecology, and oceanography.

Concluding thoughts and gaps in the literature

Emergent trends in the literature include the call for management in the context of sustainability and conservation, the recommendation of recognizing the economic benefits of surfing breaks, and the need for protection of surfing areas where coastal management decisions are made. Among the research community there is an evident call to conserve vulnerable natural surfing resources around the world. The literature identifies that indeed natural coastal surfing resources are paramount to the development of surf tourism. Indeed, coastal surfing resources are required as a baseline for the activity of surfing and the value of the resource should be observed through research and understanding which recognizes the value in both domestic and international tourism. Identifying, managing, and conserving surfing resources are at the base of related discussion of surf tourism.

Among the research community there is an evident call to take care of vulnerable surfing resources around the world. Buckley (2002b) identified that surf tourism lags behind the growth and changes in the surfing industry, thereby establishing the significance of the surf sector in tourism research. Much of the existing research is on

prolific surf tourism areas in Australia, Indonesia, and the United States, and this suggests an opportunity to conduct research in new and less trendy or prolific areas. Furthermore, issues of surf safety are all but absent in the literature.

1.3 Objective of the Study

The objectives of this research include the direction of the study and clarify the research focus in terms of foreseeable benefits, inquiry, and illumination. This research is intended to locate the facts on coastal resources for surf tourism in Thailand and present them in a manner that benefits society, government, and the environment; it is anticipated to aid in the process of making informed decisions regarding the conservation of Thailand's natural surfing resources. As a key objective, this research inventories and documents surfing areas; it assesses the identifiable issues of water quality and water safety. The research seeks explanation, clarification, and new perspectives on recreational surfing and surf tourism in Thailand. Thus the motivation for this research is not purely academic; rather it seeks to foster illumination to a previously unexplored aspect of recreation and tourism in Thailand. The following objectives are listed in methodological consequence corresponding to this study:

- Identify the demand and awareness of surf tourism in Thailand.
- Explore Thailand's Andaman Coast and assess natural surfing resources.
- Assess potential damages to natural surfing resources resulting from the 2004 Indian Ocean tsunami.
- Document and assess natural surfing resources as a proviso for surf tourism.
- Document and assess natural surfing resources as a proviso for conservation.
- Offer elucidation to the identifiable issues of water quality.
- Offer elucidation to the identifiable issues of water safety.
- Construct a body of information on coastal resource and surf tourism for the Kingdom of Thailand and the touristic academy.

1.4 Significance of the Study

This research is a public documentation and resource of the literature on surfing in Thailand, especially focused toward surfing resources; it opens a pathway for the

integration of recreational surfing into the coastal planning and management process. As the first-ever in-depth field report on surfing areas in Thailand, it provides foundational documentation to benefit decision makers in the Thai government, society, and other stakeholders; it opens a discussion on an entirely new tourism market and exposes the related complexities. Identifying surfing areas as a valuable coastal resource in Thailand has the potential to advance the conservation of surfing areas, especially in the onset of coastal development and engineering that affect coastal surfing resources.

The basis for this study is straightforward: surfing and surf tourism are occurring on Phuket and to lesser extent on other provinces in Thailand, yet preliminary inquiry found that prior to Martin and Assenov (2008) and Martin (2009) this topic had not appeared in the touristic academe. As Thailand is a country with a prolific tourism economy, an assessment of Thailand's coastal areas surfing resources was chosen as logical topic for tourism research. This research fosters a better understanding of the natural coastal resources related to surfing in Thailand; it serves to inventory the resource and to address the overall issues of conservation and management for the following reasons:

- It identifies the stakeholders and documents their perspectives.
- It buttresses a supposition that indeed waves for surfing can be found to some extent in all Andaman Coast provinces.
- It documents coastal surfing resources and related issues on the Andaman Coast.
- It provides evidence that surf tourism has potential and evaluates the potential.
- It addresses the wider implications of environmental issues.
- It contributes to the overall knowledge of surfing and the surf tourism economy and ecology for Thailand.
- It contributes to the overall global knowledge in the touristic academy, particularly surf tourism as a field of study.
- It identifies the possible benefits of developing surfing activities, including those that support the conservation of natural resources.
- It proposes how surf tourism can be guided toward sustainability.
- It presents an appropriate surfing resource management strategy for Thailand.

1.5 Scope of the Study

The scope of the study is focused on Thailand's Andaman Coast, specifically on the natural coastal resources through beach and coastal assessment. However, temporal boundaries to the study are two-fold: those of physical environs and geographic limits; and those of social significance. The former include natural resources, which are finite, quantifiable, and well suited for description; the latter include topics less static, which are open to social science analysis, and well suited for inquiry and explanation. The research area is broad and encompasses the surfing environs of Thailand's Andaman Coast through a series of assessment studies comprising physical and tangible locations of the littoral alongside identifiable issues of water quality and water safety. Although the researcher conducted coastal assessments for The Gulf of Thailand from 2007–2009, for practical and logistical reasons, the current research and discussion presented herein adheres to the topic of Thailand's Andaman Coast (see Appendix A for a synopsis of The Gulf of Thailand).

Scope of Time

The study period was from April 2007 to July 2010. As the surf season along Thailand's Andaman Coast normally begins sometime in April and ends sometime in October (with potential shoulder season activity), field research was conducted during three consecutive surf seasons along the Andaman Coast.

Scope of Geography

General statistics found herein were verified through *Thailand in Figures* (Alpha Research, 2007) and other sources. The Andaman Coast is the western seaboard of Thailand and the prominent locale in this study; it is key region for surfing activity in Thailand.

The Andaman Sea is contiguous to the Indian Ocean; the Gulf of Thailand is contiguous to the South China Sea and the Pacific Ocean. Thus peninsular Thailand is sandwiched between two seas and two very different coastlines exist in one country. Furthermore, the Gulf of Thailand has both a west-facing coast and an east-facing coast. While the Andaman coast has the resort island of Phuket, The Gulf of Thailand has the resort island of Ko Samui.

Thailand is 513,115 square kilometers, about the size of Spain; whereas Phuket, a focal point of this thesis, is 539 square kilometers, about the size of Singapore. Thailand is the fifty-first largest country in the world and the twentieth largest in population; it is the hub of continental Southeast Asia. Contiguous to Thailand are Cambodia, Laos, Myanmar, and Malaysia: The Kingdom of Cambodia to the east; Lao People's Democratic Republic and Socialist Republic of Vietnam, to the north and east; Union of Myanmar to the north and west; and Malaysia to the south. The People's Republic of China (PRC) lies not far to the north, just beyond the territories of the Golden Triangle.

Apart from the many islands in Thai waters, the country's mainland coastline covers 2,614.4 kilometers: the Andaman Coast is 739.6 kilometers and the Gulf of Thailand is 1,874.8 kilometers. Additionally, there are 500 islands in Thailand which together account for another 500km of coastline (Tridech, Simcharoen & Chongprasith, 2000). The narrowest land bridge between these oceans is the Kra Isthmus (from the estuary of the Kra River to the Bay of Sawi near the city of Chumphon) which is just 44 kilometers wide.

The Andaman Coast is comprised of six provinces: Ranong (93.2 kilometers); Phang Nga (216.2 kilometers); Phuket; Krabi (166.2 kilometers); Trang (119.2 kilometers); and Satun (144.8 kilometers). Given the longitude of the Andaman Coast (between 98 degrees to 100 degrees), it is sheltered by Sumatra from the large surf normally associated with the Indian Ocean.

Phuket, a focal point in this research, is the only island province; it is earmarked as an island dominated by a tourism culture. The increase and spatial expansion of the hotel capacity on the island of Phuket went from 555 rooms in 1975, to 18,959 rooms in 1994 (Gormsen, 1997), to 36,822 rooms in 2007 (Tourism Authority of Thailand, 2007). At the time of writing, Phuket supports more than 620 hotels, with an estimated five million visitors from over forty countries each year (ibid).

Thailand's climate is tropical and monsoonal. Rain, wind, and waves regularly approach the Andaman Coast from the west during the southwest monsoon from April through October. Conversely, rain, wind, and waves regularly approach the Gulf of Thailand from the east with the northeast monsoon from November through March.

Figure 1.3 illustrates continental South East Asia and the six provinces of Andaman Coast Thailand.

Figure 1.3 Continental South East Asia



Source: Author

1.6 Definition of Terms

This section provides operational definitions for words and expressions specific to the thesis at hand. Terminology related to surfing is found in any number of areas, from colloquial speech to those oriented in the disciplines of study, including the social sciences alongside the physical and natural sciences. For example, and relevant to this research, definitions encompass those used in toponymy, oceanography, meteorology, coastal studies, coastal management, and the environment sciences.

Administration and management of the littoral encompasses two broad terms: Coastal Resource Management (CRM) (the study and supervision of the littoral); and Integrated Coastal Zone Management (ICZM) (the multi-disciplinary and interactive process employed to promote sustainable management of coastal zones).

Toponyms on the Andaman littoral reflect a myriad of languages, including Thai and those from Malayo-Polynesian languages. The following are common Thai place names found throughout this research:

■ Hat: Beach	■ Pakarang: Coral
■ Ao: Bay	■ Khao: Mountain
■ Laem: Cape	■ Klong: Canal
■ Ko: Island	■ Mu Ko: Archipelago

Relevant to this thesis are types of surfing, including body surfing, body boarding, board surfing, stand up paddling (SUP), tow-in surfing, kite surfing, and windsurfing. Similarly, the types of surfers and surf tourists corresponding to the various forms of wave riding and travel behaviors deserve clarification.

Scientific language and the methods applied to surfing have produced a new interdisciplinary ‘surf science’ or ‘surfology’, such as when hard sciences are used to research how, when, where and why the waves break. These terms may include those related to the disciplines of meteorology and oceanography.

Types of surf areas, called ‘surf breaks’ are the specific locations in the sea where a wave breaks and surfing recurrently occurs. When a wave enters shallow water, it eventually breaks. The various ways a wave can break is related to the suddenness with which it releases its energy. Different types of waves are suited to different types surfers based on wave steepness, and the degree of vertical slope on the open face of the wave; the

steeper the wave is, the more vertical the face, hence the more dangerous and challenging the ride.

Surfers are commonly understood to have their own vocabulary and surf jargon to describe their natural and social environs. For example, when a wave is ‘rideable’ it may be called ‘surfable’.

A shortlist of terminology related to surfing and this thesis includes the following subject areas: types of surfing and surfers, meteorology and oceanography; types of surfing areas; types of waves; surf jargon; and ocean safety. Details are listed alphabetically.

Types of surfing and surfers

- Body boarding: a small board used to ride wave while laying down.
- Body surfing: surfing on one’s body; riding a wave without a board.
- Kite surfing: using the wind as a source of power while standing on a small board.
- Stand-up paddling (SUP): a large surfboard propelled and surfed while standing up.
- Surf (n.): generally defined as the swell of the sea that breaks upon the shore, or the splash and sound of breaking waves.
- Surf (v.): to ride waves in any of the capacities above.
- Surf tourism: traveling for the purpose of surfing (see literature review for discussion on surf tourism).
- Surf tourist: a tourist who travels with surfing as the primary motivation (Ponting, 2008).
- Surfing tourist: a tourist that goes surfing (Ponting, 2008). Also called an “incidental surf tourist” or a tourist engages in surfing activities while on vacation (Martin & Assenov, 2008).
- Surfing: the sport of riding the surf, especially on a surfboard.
- Tow-in surfing: when a personal watercraft is used to tow a surfer into a wave.
- Windsurfing: riding wind or wind and waves while standing on a board with a mast. Also called ‘sailboarding’.

Meteorology and oceanography

- Bathymetry: the two-dimensional shape of the sea-floor, resulting in different water depths at different positions (Butt and Russell, 2007).
- Backwash: Following the up-rush of water onto a beach after the breaking of a wave, the seaward backrush occurs (Bowditch, 1995).
- Fetch: fetch length, is a term for the length of water over which a given wind has blown.
- Groundswell: deep-water ocean swells generated by low pressure systems and arrive at the coast as 'long period swell'.
- Littoral: the intertidal zone, or the area between the water mark which is rarely inundated to shoreline areas that are permanently submerged.
- Long-period swell: fast-moving swells generated by strong storm systems which are capable of travelling great distances. Normally identified as having more than 14 seconds between wave crests.
- Monsoon: name for seasonal winds; in India, the term is popularly applied to the south-west monsoon and also the rains that it brings (Butt and Russell, 2007).
- Shot-period swell: slow-traveling swells generated by steady winds capable of travelling relatively short distances. Normally identified as having less than 12 seconds between wave crests.
- Swell (ocean swells): waves traveling in the open sea.
- Swell window: the openness of a coastline to receive waves from a particular direction.
- Wave period: the time taken between the passing of one wave crest and the next (Butt and Russell, 2007). Also called 'swell interval'. Normally describes 'short period' or 'long period' swells.
- Windsea: a mixed-up sea containing waves of many different heights, wavelengths and directions; waves still being generated by the wind (Butt and Russell, 2007).
- Windswell: waves generated by local weather systems (often high-pressure systems) which arrive at the coast as 'short period swell'.

Three types of surfing areas (Warshaw, 2005)

- Beach break: the type of waves that take shape over a sandy beach and are dependent on sand bars. Beach breaks are more mutable and unpredictable than surf found at point breaks or reef breaks.
- Point break: the type of wave that breaks around a point of land, and is generally long, evenly tapered, and predictable.
- Reef break: the type of wave that is centered on a permanent high spot in the underwater topography [a reef] almost always formed by either rock or coral.

Three general classes of breakers (Bowditch, 2007)

- Plunging breaker: tends to curl over and break with a single crash (good for surfing).
- Spilling breaker: A wave that breaks gradually over a considerable distance.
- Surging breaker: peaks up, but surges up the beach without spilling or plunging.

Ocean safety

- Backwash: when waves which arrive at a beach and then ‘bounce’ off the shore whereby their energy return to the sea. Normally associated with high tides and steep beaches.
- Longshore current: currents that run parallel to the beach, inside of the surf zone (most common along straight beaches) (Bowditch, 1995).
- Rescue: when an individual, acting as a lifesaver, whether civilian or professional, performs a rescue or assists another person (referred to as a victim) to safety in the aquatic environment.
- Rip currents: strong near-shore ocean currents which pose a danger to swimmers and surfers; a river-like flow of water returning to the open sea.

Classification of cyclonic activity in Thai waters (WMO, 2007)

- Tropical depression up to 33 knots (59 km/hr)
- Tropical or Cyclonic storm 34–63 knots (60–119 km/hr)
- Cyclone 64 knots (119 km/hr) or more

Types of surf tourists in Thailand (Martin & Assenov, 2008)

- **Hard surf tourist:** A surfer traveling to Thailand for the sole purpose of surfing, including those who come for a surf vacation or a competition. Such an individual would likely have high motivation and deep experience. See definition for surf tourist (Ponting, 2008).
- **Soft surf tourist:** A surfer who comes to Thailand with surfing as an objective of, but not a primary motivation for, his or her travel. Such an individual would likely be competent in surfing. See the previously listed definitions for 'surf tourist' and 'surfing tourist' (Ponting, 2008).
- **Incidental surf tourist:** An individual with little or no prior knowledge of surfing in Thailand, but while visiting the beach on vacation observes others engaging in the activity and takes a spontaneous decision to participate. See definition for surfing tourist (Ponting, 2008).

Surf jargon

- **Surfable:** When a wave can be ridden by a surfer, such as the moment the wave breaks or when a variety of environmental conditions are met conducive to the activity of surfing. *Antonym:* unsurfable.

CHAPTER 2

METHODS

Distinguishing the natural resource for surfing in Thailand forms the basis of the research method. Given the limited body of research involving surfing in Thailand, an exploratory approach was adopted to investigate and assess coastal surfing resources; it considers both recreational surfing and surf tourism. Therein, the research engages an inductive approach whereby the original and methodological approach was based upon the researcher's knowledge, supposition, and prior research results. In this context, the researcher conducted a variety of assessment studies leading to the detailed description of coastal surfing resources prospect to their sustainability and long-term management. Given the increase in recreational surfing and surf tourism along Thailand's Andaman seaboard over the previous decade, the research is assumed relevant to Thailand's hospitality and tourism industry.

The research methods evolved over time into an interdisciplinary study whereby the exploratory research adopted an assessment study of the physical 'surfing capital' including the contiguous issues related to the natural environment, such as water quality and marine debris, and the frequency and quality of surfing waves in various coastal regions. Social implications include water safety issues, such as surf-related drowning reported in newspapers and the researcher's personal experience of encountering distressed swimmers in the water. The query also includes the coastal degradation and psychological impact resulting from the 2004 Indian Ocean tsunami.

The research methods are presented in the following sequence.

- Dialectic of the methodological process.
- Tourism as interdisciplinary study.
- Description and approach to the study.
- The research design.
- Qualitative and experiential methods: exploratory research; social science data collection; printed and electronic materials; adaptive approach; participant observation; communication and collaboration; participatory mapping; interdisciplinary approach; quantification of data; brief of evidence of the researcher.

2.1 Dialectic of the Methodological Process

The methodology evolved and adapted to the Thailand context as relevant topics emerged to form a dialectal process which identified resource limitations and problems running counter to the original thesis.

Whereas the thesis approach was centered on the assessment of Thailand's surfing resources in the face of the rapid development of the sport (i.e. the prospect or promise of coastal surfing resources), an anti-thesis emerges in the context of limited natural surfing resources, access to the resources, water quality issues (including marine debris and pollution) and safety issues (including drowning related to wave activity during the surf season). The thesis and anti-thesis reconcile in the context of sustainability and conservation. The synthesis forms a framework to explore the impact of the research findings in relation with social and physical host environments, including the conservation of surfing areas.

The dialectic of the research process matured into an interdisciplinary study. Although the research identified considerable natural and manmade resources for surf tourism and a positive potential for tourism economy and imagery, an anti-thesis emerged in view of significant environmental, health, and water quality issues with a potentially negative imagery. The synthesis steers the research methodology toward a discussion on sustainable development through the conservation of surfing areas, community education, and for the future research of the physical environment and social elements.

Thesis:	The prospect of coastal resources for surfing in Thailand
Anti-thesis:	Resource limitations; environmental degradation; safety concerns
Synthesis:	Sustainability; conservation
Dialectic:	Prospects vs. challenges for recreational surfing in Thailand

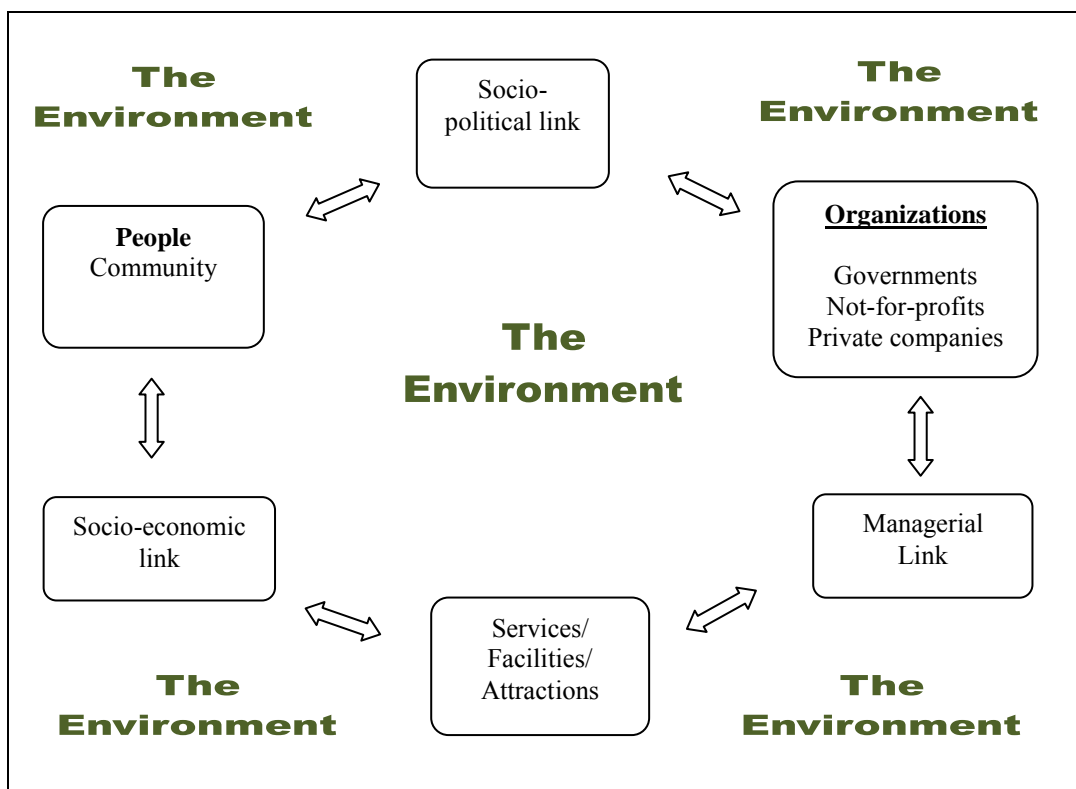
2.2 Tourism as Interdisciplinary Study

Veal (2006) suggests that leisure and tourism exists in an interdisciplinary framework whereby the physical environment is the baseline for all touristic activities (Figure 2.1). Although the current study is centered on the physical environment, people and the community are inherent to the discussion, especially at the conservation level as stakeholders, governments, and not-for-profit organizations serve as custodians of the resource.

Veal (ibid.) provides the following conceptual representation of the world within which hospitality and tourism exists, and which may assist in placing the various disciplinary approaches into perspective – consisting of five main elements:

- People
- Organizations
- Services/facilities/attractions
- The linkages between these three; and
- The physical environment within which everything takes place

Figure 2.1 Interdisciplinary Framework for Leisure and Tourism



Source: Adapted from Veal (2006)

The physical surfing environment

As identified in the literature review, Lazarow (2008) introduced a typology of ‘surfing capital’ as a means of identifying market and non-market aspects of surfing areas and includes a wide range of physical and social categories. The interdisciplinary aspect of surfing capital in this thesis is focused primarily on three aspects of the physical environment: (1) wave quality as a physical form; (2) wave frequency or

consistency ('surfable' waves measured against an accepted standard); and (3) environmental or biophysical conditions that may mitigate a surfers' physical health, such as water quality.

2.3 Description and Approach to the Study

The following research is exploratory in nature and descriptive in style. The researcher systematically explored coastal areas (those predetermined through monitoring weather patterns, surf forecast charts, and communication with other surfers) by land and sea, kept detailed field notes, and generated hand-drawn maps of each area. Methods were centered on the documentation and discovery of surfing sites, establishing the quality of water and waves, determination of potential hazards and safety issues, and the acknowledgement of the built environment and amenities (including hotels, infrastructure, and accessibility). This research process included the weighing up and ordering of findings and the return to field sites for clarification.

The methods were extensive in breadth and depth. In breadth the research considers the entire Andaman coast of Thailand; it identifies and considers many topics related to the study. In depth it develops detailed methodologies tailored to fit preliminary findings; it presents comprehensive data for specific research areas. Encompassing nearly 800 kilometers of coastline, the study was geographic in scope, built upon the author's fieldwork, and focused on inventorying and evaluating the country's surfing areas.

Thailand as the primary research site came progressively for a number of reasons, including the accessibility of new and rich sources of field data. Considering Thailand's tourism atmosphere and infrastructure (including well-developed roads), it was an inviting and favorable research area where indeed the researcher was able to carry out independent exploratory research in various provinces on the Andaman Coast. During the study, the researcher had the opportunity for participant observation at surfing areas and to participate as a competitor and judge at surfing competitions. Lastly, the researcher was based at Prince of Songkla University, Phuket Campus, affording access to academic materials; opportunities abounded to discuss the research among scholars across faculties and disciplines of study, and to participate in on-campus conferences.

2.4 The Research Design

Veal (2006) identifies three broad approaches to research in the leisure and tourism field: descriptive research; explanatory research; and evaluative research. As leisure and tourism are relatively new disciplines of study, Veal (ibid.) identifies that “there is a need to map the territory” and describes such research as “exploratory” as it seeks to discover and describe. In an explanatory context, tourism research identifies “how or why things are as they are” as a proscriptive tool.

Initially, a surf tourism survey was conducted to distinguish if surf tourism was indeed prevalent in Thailand (see section 2.5, social science data collection) and the data was incorporated in Martin and Assenov (2008). The literature review indicated that previous studies on surf tourism around the world targeted locations where prolific surf tourism was occurring and eminent, such as Indonesia, Australia, and Costa Rica. Thailand however, at the time of writing, was at a very early stage of development and literature on surfing was particularly limited.

The methodology for the coastal surfing assessment was different from that of previous studies on surf tourism. For example, whereas the Mentawai Archipelago offers a wave-rich, amenity-poor destination, where boat-based tourism dominates the business seascape, Thailand is amenity-rich, wave-poor destination (comparatively), where land-based resorts and infrastructure dominate the coastal landscape. In Thailand, where very little surfing occurs outside Phuket, the discovery, assessment, and description of surfing areas on the Thai littoral offered rich new opportunities to collect primary and original data.

To the researcher in the field, the Andaman coastline is expansive and visibly well-deserving of assessment and description. However, the Thai littoral has never been systematically charted or assessed for recreational surfing areas as coastal resources. Given the identifiable significance of surf tourism, as established by the literature review, the inventory of surfing areas is recognized as foundational to identifying the country’s potential for surf tourism. Therefore, the research design and methodology employed a series of assessment studies on Thailand’s coastal and marine resources in the context surf tourism appropriate and framed to the Thai context.

2.5 Qualitative and Experiential Methods

Exploratory approach

Although Phuket is the key location for surfing in Thailand, the research is not focused exclusively on Phuket. During the researcher's preliminary fieldwork, it was determined that indeed there were other areas in Thailand suitable for surfboard riding and this comprehensive exploratory research was conceived. At the prospect of identifying and charting surf sites on the entire Andaman Coast, a three-year (three surf-season) coastal survey and mapping campaign was conducted. The greater part of data and map design stem from the researcher's field observations, including those gained from surfing and exploring coastal areas by surfboard. As an exploratory research, the process was systematic:

- Explore the littoral and identify potential surfing areas.
- Document findings with detailed field notes, photography, and hand-drawn maps.
- Organize and analyze information gathered in the field.
- Make assessments and generate descriptions and maps.
- Return to surf sites for clarification of data.
- Identify relevant topics and categories for discussion.
- Present findings in summaries, tables and maps.

Social science data collection

Conducted in September 2007, a surf tourist survey was undertaken, whereby a questionnaire designed by the researcher served to guide structured interviews with 42 surf tourists at Kata Beach, Phuket (see Appendix E). The survey was initiated to establish a set of general statistics on surf tourist behavior, attitude, experience, and overall perception of surfing in Thailand. In the years following, interviews were conducted with three groups of surfers, including local Thais, foreign residents, and tourists regarding their knowledge of surfing areas and related issues. These individuals included surf club members and surf shop owners and employees. In this way, the researcher was able to put together a body of collective information. Social science data was collected primarily through interviews through a mixture of approaches with a diversity of stakeholders:

- 42 structured interviews (surf tourist survey).
- 48 unstructured conversations with Thai and foreign resident surfers.
- 119 unstructured conversations with surf/surfing tourists.
- 33 structured interviews with members of the community, government, and corporate sectors.

Printed and electronic materials

Printed materials used in the survey and charting phases of the research including a comprehensive selection of printed maps and charts were gathered and consulted, including those from public and governmental sources, including official hydrographic charts. Furthermore regional yachting guides were referenced, namely the *Andaman Sea Pilot* and *Sail Thailand*. Electronic data sources included the use of Google Earth and a myriad of surf forecasting sites offering regional data, including the Thai Meteorological Department, Surfline, Magic Seaweed, Bouyweather, Ocean Weather, and Wind Guru. Websites providing surfing information on Thailand were also referenced, including Saltwater-dreaming.com, Phuket.com, Wannasurf.com, Globalsurfers.com, and other sources.

Adaptive approach

Throughout the three-year study period the research methodology incorporated a spontaneous and adaptive approach as the researcher developed a network of informants over time. Many informants were met during the first year of exploratory research and the research methodology developed over time as it incorporated new sources of information into the study. Furthermore, during the period of research there was a surge in events related to the study, such as the surf contests which gained corporate sponsorship in 2009 from Quiksilver. Other unanticipated sources of data came from the media, such as newspaper articles, including articles related to beach cleanup activities, water safety issues, and surf-related drowning in Phuket.

Participant observation

The researcher engaged in participant observation by surfing whenever possible, and through participating and serving as a surf contest official at all three annual surfing competitions occurring in Phuket (The Kalim Surfing Contest, The Kamala Beach

Surfing Contest, and the Phuket Surfing Contest at Kata Beach) for three consecutive years (2007–2009). The participatory approach allowed the researcher access to members of the surfing community and new sources of information.

Communication and collaboration

Communication and collaboration included other surfers in order to compare conditions between locations at a given point in time. For example, cell phone communication with Pakarang Surf Shop owner Matt Blauer during periods of wave activity were frequently conducted to compare surfing conditions, wave heights, and water quality at different locations between Phuket and Phang Nga provinces. Overall, observations were measured on an agreed scale and communication was done by telephone, email, and face-to-face meetings.

Participatory mapping

As aforementioned, mapping coastal resources is intrinsic to the ICZM process; it is at the core of the documentation and assessment of the resources in question. Spatial representations of coastal issues, namely maps, have long been a critically important tool for CRM (NOAA, 2009).

Dynamics in the development of methodology included mapping as an outgrowth of the research design. This is to say that mapping was initially a field methodology, whereby hand-drawn sketches served to document surfing areas. However, field sketches evolved into a product and result of the study through a progression of revisions leading to the graphic design of detailed maps for publication in the research. From an institutional point of view, the researcher employed a ‘participatory mapping’ approach (NOAA, 2009), whereby the information (and to some extent primary data, i.e. latitude and longitude of surfing areas) independently produced in this study are made available ICZM organizations operating in the region. Although this research was unable to employ GIS (Geographic Information System) technology per se, the study is a criterion for the collection of data on surfing sites in the context of ICZM and GIS. Additionally, photographing surfing areas was part of the documentation and map-making process; it provided a means for the recordation, review, and assessment of surfing areas.

Interdisciplinary approach

A wide variety of disciplines of study were incorporated into the research design, mainly those in physical geography and oceanography, including cartography, meteorology, climatology, bathymetry, ecology, and coastal studies and processes. Social science topics were also developed and integrated into the interdisciplinary approach of the research.

The researcher arrived at several categories (approaches to the study) through personal experience, interviews, and literature review. These categories provide a framework for the description and result of the beach and coastal assessment for the physical and social environments. The host environment is described in terms of the coastal resources with the following criteria chosen for data collection, assessment, and description:

- Surf resources, including waves, winds, and locations
- Natural environment, including beaches and reefs
- Water quality, including pollution and marine debris
- Safety issues, including ocean currents and drowning
- Built environment, including amenities
- Governance and access

Quantification of data

Attempting to quantify the physical surfing resources and associated conditions poses challenges, and the following general aspects require consideration in the research approach. First, ocean and weather conditions change. Secondly, many surfing locations in Thailand (primarily reef and point breaks) are highly tide-dependent (only ‘surfable’ on specific tides) and therefore afford only limited accessibility and measurability. Thirdly, as with many surf sites around the world, Thailand’s waves are adversely affected by wind directions, and given that Thailand’s surf is frequently associated with monsoon winds, evaluating sites in the presence of local weather conditions posed challenges. Fourthly, most of Thailand’s surf sites are beaches with sand banks which may shift from day to day. Therefore, descriptions are not purely academic and are based on the researcher’s judgment with cross-referencing extant literature, internet sources, and personal interviews with local surfers. Data were presented and re-evaluated in an informal

focus groups consisting of Thai and foreign-resident surfers, lifeguards, and local surf club members, and the community.

Statistical analysis of marine debris (results of plastic bags collected as part of the water quality assessment) as well as the ocean rescue data gathered from interviews with surfers (as part of the water safety assessment) was manageable through basic arithmetic.

Brief of evidence of the researcher's qualifications

Brief of evidence of the researcher's qualifications to conduct independent field research related to surfing and ocean safety is as follows: thirty years of surfing experience in twenty-five countries; five years service as a Hawaii County Water Safety Officer; one summer of service as a California State Park Lifeguard; ten years service as an American Red Cross Water Safety, First-aid, and CPR Instructor; five years owner and operator of an international surfing school in Kailua-Kona, Hawaii; surfing contest competitor or official in Hawaii, North America, Central America, Africa, Europe and Asia; and over one-hundred surf-related ocean rescues.

CHAPTER 3

RESULTS

This chapter focuses on the results from the quantitative and qualitative data derived from the 2007 surf tourist survey, and the 2007–2010 exploratory research, personal and participatory observations and mapping, and personal interviews.

3.1 Kata Beach Surf Tourist Survey

Based on 42 structured interviews (see questionnaire attached as Appendix E) with surf tourists at Kata Beach in September 2007, the following results offer insight to the motivations and demographics of surf tourism in Phuket. The survey served to establish that surfers visit Thailand for surfing; it set the stage for subsequent research carried out from 2007 through 2010.

The surf tourist survey found that the majority of surf tourists were male (71%); most were professionals, self-employed or students. Japan and Canada were the two main countries of residence (11.9% each), followed by the United Kingdom and Australia. From a regional perspective, Europe was the largest market segment, followed by North America, Asia, and Australia (See Table 3.1). Only six (14.3 %) out of forty-two of respondents were on a package tour and 85.7 % were FIT (Free Independent Travelers). The lead time for travel was less than one month for 52.4 % of the respondents, whereas 45.3 % planned had their trip between three months and one year in advance.

Purpose of visit

When examining the purpose of visit in relation to surf tourism (Table 3.2), interviews indicated that 54.8 % of the surf tourists felt surfing was of special interest in their visit and 38.1 % expressed that surfing was the main purpose of visit. 92.9 % of the surf tourists interviewed were on holiday, vacation, or leisure; whereas only 3 % were in Phuket for business. No respondents were visiting friends, family, or relatives. Regarding special interests in Phuket, 76.2 % of respondents felt that water sports were their special interest during the Phuket visit, and 73.8 % also felt that sun and beach were of special interest. To a lesser extent, culture and night life were also important. Although surf, sun, and beach were of primary interest, Phuket surf tourists were also looking for cultural experiences and night life.

Table 3.1 Thailand Surf Tourism Demographics

Region of Residence	Country of Residence	City of Residence	Nationality	Occupation
Asia	Japan	Tokyo	Japanese	technical
	Japan	Tokyo	Japanese	business consultant
	Japan	Kanagawa	Japanese	manager
	Japan	Kanagawa	Japanese	painter
	Japan	Tokyo	Japanese	engineer
	Korea	Korea	Korean	doctor
	Taiwan	Taichung	American	translator
Europe	United Kingdom	Middleborough	British	unemployed
	United Kingdom	Dawlish	British	lifeguard
	United Kingdom	S. Hampton	British	armed forces
	United Kingdom	Reading	British	student
	Switzerland	Zurich	Swiss	none
	France	Paris	French	student
	Ireland	Dublin	Irish	h.r. manager
	Finland	Helsinki	Finish	entrepreneur
	Austria	Innsbruck	Austrian	student
	Austria	Innsbruck	Austrian	snowboard instructor
	Sweden	-	Swedish	property consultant
	Sweden	Falkoping	Swedish	car industry worker
	Sweden	Linkoping	Swedish	unemployed
	Italy	Alasio	Italian	manufacturer
	Holland	The Hague	Dutch	civil servant
	Russia	Moscow	Russian	IT
	Germany	Merman	German	student
North America	Canada	Montreal	Canadian	child care
	Canada	Montreal	Canadian	teacher
	Canada	Vancouver	Canadian	paper manufacturer
	Canada	Ottawa	Canadian	student
	Canada	Toronto	Canadian	researcher
	United States	Sandy	British	actress
	United States	Washington DC	American	journalist
Australia & New Zealand	Australia	Melbourne	Australian	foot ball player
	Australia	Perth	French	restaurant manager
	Australia	Melbourne	Australian	building constructor
	Australia	Melbourne	Australian	student
	New Zealand	Port Punakiki	New Zealand	logger
	New Zealand	Auckland	South African	sales person
Africa	South Africa	Durban	South African	business

Source: Martin and Assenov (2008)

Table 3.2 Purpose of Visit

Purpose of Visit		Percentage
Overall purpose	holiday/vacation/leisure	92.9
	business	7.1
	visiting friends/relatives	0
Surfing as main purpose		38.1
Special interest (secondary purpose)		
Water sports		76.2
Sun and Beach		73.8
Surfing		54.8
Culture		40.5
Night life		35.7
Adventure		28.6
Shopping		19
Spa		16.7
Others		2.4

Source: Martin and Assenov (2008)

Quality of experience

When asked about the quality of their surfing experience, 23 felt their overall holiday experience for surfing was good and another 16 said it was beyond their expectation. Therefore, 39 out of 42 informants expressed having had a positive experience. Male respondents were particularly optimistic (Table 3.3).

Table 3.3 Overall Surf Vacation Experience

Gender	Rating for Overall Holiday		
	Satisfactory	Good	Beyond Expectation
Female	1	8	3
Male	2	15	13
Total	3	23	16

Source: Martin and Assenov (2008)

Past surfing experience

Previous to visiting Phuket, surf tourists had visited a number of other countries for surfing for the period of the 3 years prior to visiting Phuket (Table 3.4). For the most part they had visited Bali, Australia, France, Maldives, and the USA, all of which are renowned for excellent surfing. This may indicate that travel for the sake of surfing influences destination choice and that Thailand is being recognized by surf tourists as a worthy

destination. Countries and regions visited during the 3 years prior to visiting Thailand for surfing include Sri Lanka, Portugal, Ireland, Brazil, El Salvador, Mexico, Canada, the Caribbean, Seychelles, Mozambique, and New Zealand.

Table 3.4 Past Surfing Experience (Most Popular Destinations)

Country Visited	Percentage of Respondents
Bali	13.5%
Australia	13.5%
Maldives	8.1%
USA	8.1%
France	10.8%

Source: Martin and Assenov (2008)

Perceptions of water quality

Regarding overall water quality, subjective opinions of surfers varied. While 7% responded that water quality at Kata Beach was 'very clean', 18% replied it was 'clean', 53% felt it was 'fair', and 22% identified it as 'not clean'. The results indicate that the majority of surfers felt the water quality was 'fair' this would indicate that water quality was less than ideal. Taken as a whole, surf tourist comments and recommendations were recorded and organized into the following categories by percentage of response:

- 57% identified that beach trash [marine debris] in Phuket is unattractive and expressed concern for the issue.
- 33% of surf tourists suggested that surf lessons, surf schools, or surf education are needed.
- 28% suggested there should be better promotion or advertisement for surfing.
- 18% felt there should be more (or better) surf shops.
- 15% felt there was not enough infrastructure at Kata Beach.
- 13% said there are safety issues, especially regarding the jet ski and boat traffic in the surfing area.
- 9% felt the Kata area was well developed for the sport.

Types of surf tourists

The surf tourist survey indicates that indeed people engage in surfing during their holiday in Phuket. Martin and Assenov (2008) identified three types of surfers in

Phuket based on motivation: hard, soft, and incidental (see the definition of terms in Chapter 1). A hard surf tourist is someone traveling to Thailand for the sole purpose of surfing, including those who come for a surf vacation or a competition. Such an individual would likely have high motivation and deep experience. A soft surf tourist is considered any surfer who comes to Thailand with surfing as an objective of, but not a primary motivation for, his or her travel. An incidental surf tourist is one who may have little or no prior knowledge of surfing in Thailand, but while at the beach on vacation sees others engaging in the activity and takes a spontaneous decision to participate. Given the definition provided by Ponting (2008), the majority of those interviewed in Phuket were ‘surfing tourists’ (tourists who may go surfing or take surfing lessons while on vacation), while nearly 40% were ‘surf tourists’ (a tourist who travels with surfing as the primary motivation).

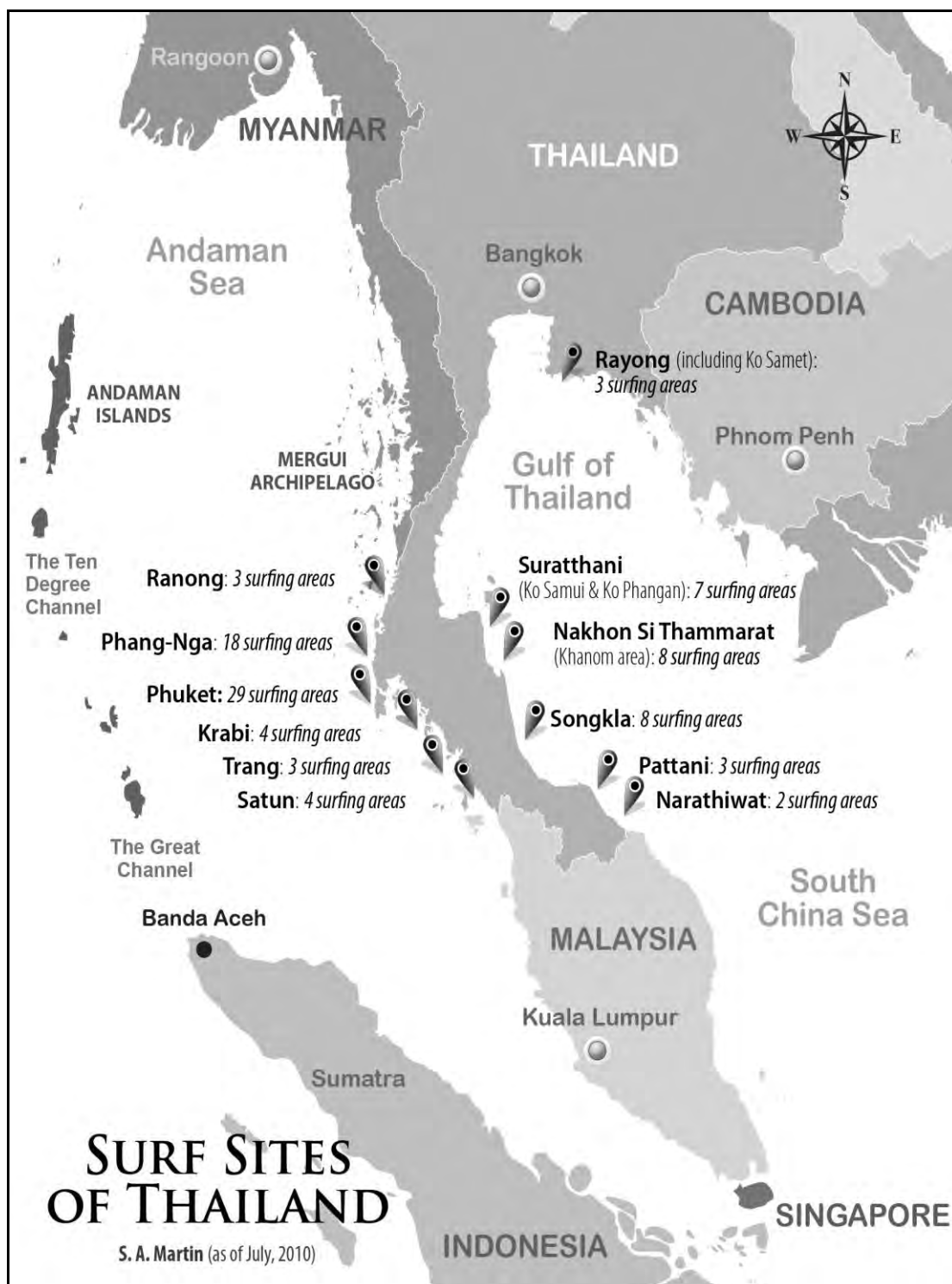
3.2 Coastal Resource Assessment

The results of the coastal resource assessment for the physical environment of the Andaman Coast are focused on the surfing season, the swell windows, the complexity of swell types, the swell directions, and the inventory of surfing areas. The research presents the findings in the following sequence:

- Surfing areas of Thailand
- The 2004 Indian Ocean tsunami
- Andaman Coast swell windows
- Andaman Coast bathymetry
- Andaman tides
- Andaman wave types and swell directions
- Documentation of surfing areas by province

The research found that the Andaman Coast represents only one-third of Thailand’s coastal area, yet it encompasses the greater share of the country’s surfing areas. Nonetheless, the Gulf of Thailand was included in the exploratory field research. Based on the findings, Figure 3.1 identifies the surfing areas in Thailand by province. Figure 3.1 is not an exhaustive account, rather it represents surfing areas located and assessed by the researcher prior to July 2010; 61 surfing areas on the Andaman Coast and 31 on the Gulf of Thailand. The forthcoming results adhere to the Andaman Coast, while, a brief summary of findings for the Gulf of Thailand are provided in Appendix A.

Figure 3.1 Surfing Sites of Thailand



Source: Author

3.2.1 The 2004 Indian Ocean Tsunami and the Surfing Environment

As widely understood the 2004 Indian Ocean tsunami devastated the Thai littoral, leaving at least 5,395 people dead and 2,995 people missing on the Andaman Coast (Kelmelis et al., 2006), and causing damage to the built and natural environments. While the land sustained salt invasion; coral reefs, mangrove forests, and sea grass beds along the coast were adversely affected.

Interviews with surfers

Interviews with surfers who were familiar with surfing areas prior to the tsunami indicate that most surfing areas have more or less returned to the pre-tsunami condition. Fekete (2009 personal communication) notes, “I don’t think the tsunami really changed anything, but there may have been an immediate change during the first few swells after the tsunami. Even this short term effect is arguable as the tsunami happened during the high season and there was no opportunity for an “immediate comparison.” Once the monsoon kicked in, I think the sand quickly moved back to where it was before. As for the reefs, there certainly were some big chunks moved around, but I can’t really say any of the breaks have been fundamentally changed.” Thompson (2009 personal communication) notes that the Kalim reef (Patong) was filled in with sand/sediment deposits by the tsunami and wave quality actually improved for a while before returning to more or less normal. Comparatively, surf spots in the Andaman Islands were more drastically changed, whereby surfing reefs (reefs that create waves appropriate for surfing) which were once underwater are now “raised in the air and baking in the sun” (ibid.)

Blauer (2008 personal communication) suggests “The Andaman coast was scoured by the tsunami and many beaches and surf sites were altered to some degree, whereby corals and sand deposits, which had developed over the centuries, were changed by the event. For example, the Laem Pakarang area in Khao Lak was stripped clean of sand and coral deposits and enormous corals were ripped up and thrown onshore. I have watched the sand and coral deposits slowly returning. Things seem like they have returned to normal.” Figure 3.2 (satellite photo) shows the sand and coral deposits prior to (pictured at left) and after (pictured at right) the 2004 Indian Ocean tsunami at Laem Pakarang, Phang Nga Province.

Figure 3.2 Laem Pakarang, Phang Nga Province



Source: www.globalsecurity.org/military/world/thailand/khaolak-imagery.htm (2005)

As research had not been conducted on surfing areas prior to or immediately after the tsunami event, very little is known regarding the affects of the tsunami on coastal surfing resources. Similarly, there were fewer surfers on the Andaman Coast prior to the tsunami than at the time of writing. Through the course of this study, the researcher encountered a small number of individuals able to offer a discussion on the affects of tsunami on surfing areas. However, albeit anecdotal evidence, surfers reported the following general observations:

- “Beaches and surfing areas were noticeably changed after the tsunami, however most areas returned to normal after 1 year.”
- “Today [2010], most areas have returned to normal, although some areas remained ‘rockier’ for several years.”
- “Beaches seemed ‘fuller’ and ‘wider’ before the tsunami.”
- “I don’t know how to explain it, but surfing beaches seem different now [post tsunami].”
- “Surfing reefs seemed healthier before the tsunami.”
- “Surfing reefs at Nai Yang are less healthy now.”
- “Most surfing areas seem to have returned to normal, more or less.”

- “The ‘lefts’ at Kalim reef were longer after the tsunami.”
- “The surfing areas at Laem Pakarang area making a comeback, and the sand and coral deposits are returning to form an island of coral debris near the northwestern area of the cape.”

Psychological impact of the tsunami

Surfers have returned to the Khao Lak area, and surfing has increased in the years following the tsunami. However, the post-tsunami surfers are mainly surfing tourists and foreign residents from Phuket, and did not personally experience the tragedy in Khao Lak (Blauer, 2009 personal communication). At Laem Pakarang (north of Khao Lak) at least one surfer, 53-year-old David “Taxi Dave” Samman, died while building his ‘surfing retirement’ home at the time of the tsunami (Sommer, 2004). Subsequently, the right point break at Laem Pakarang was named “Taxi Dave’s” (Blauer, 2009 personal communication). This may help the new surfers to make the connection between the period prior to the tsunami and today (ibid.).

At the psychological level, there are lasting images embedded in the minds and lives of people with direct personal experience with the tsunami. For example, coastal communities in Khao Lak are easily upset and “jumpy” at the news broadcasts of regional earthquakes and misunderstandings related to the tsunami warning system information (Blauer, 2009 personal communication). In point of fact, news of an earthquake in Indonesia in 2009 mistakenly provoked villages in the Bang Niang area to evacuate, resulting in traffic jams and car accidents (ibid.).

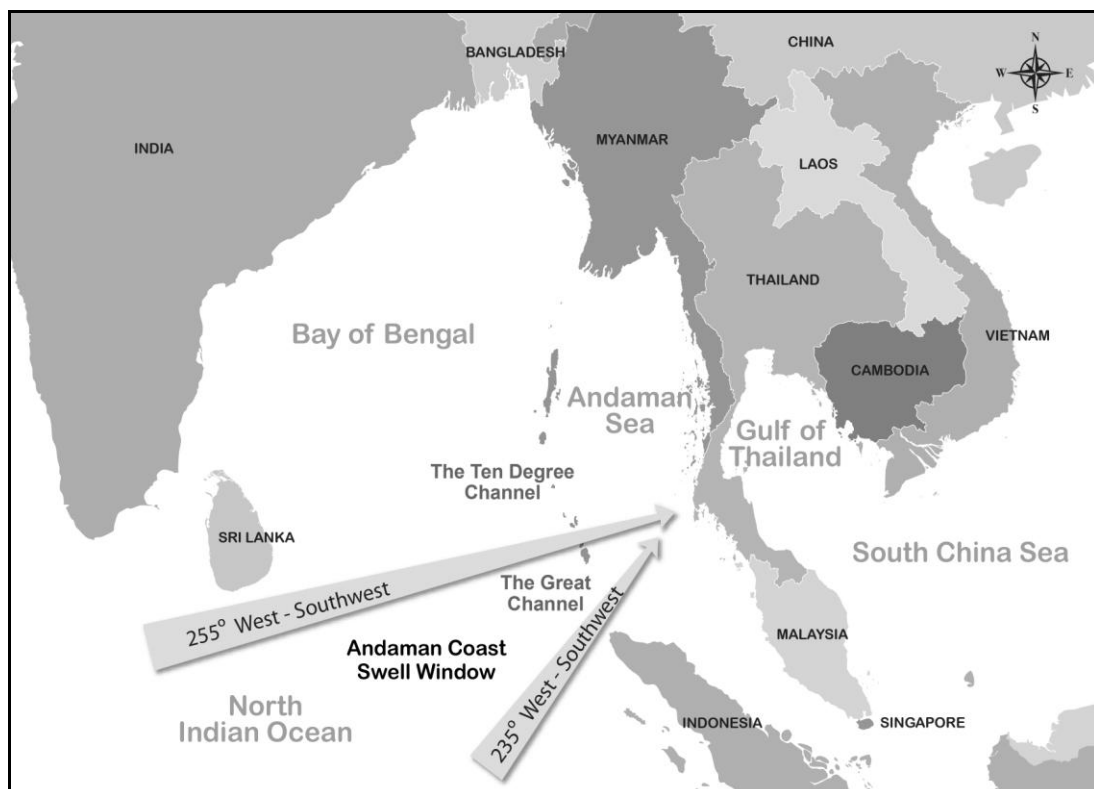
(Sokhannaro, 2006) identifies that the tsunami had an impact on people’s psychology regarding use of aquatic resources. For example: they were afraid to go in the water because they believe that there are ghosts at sea; fish had eaten those who died in the tsunami; or another tsunami might happen at any time without warning. Conversely, the study also showed that fisher communities, particularly the elder fishermen, were wholehearted toward returning to work at sea (ibid.). Blauer (2010 personal communication) believes that as there were few, if any, Thai surfers in the Phang Nga vicinity prior to the tsunami, it is unlikely that the sport will be popular in the near future among coastal communities in these tsunami-affected areas.

3.2.2 Andaman Coast Swell Windows

Swell window suggests the ‘openness’ of the coast to receive waves traveling from the open sea. The ‘openness’ of the Andaman Coast to the wave activity generated in the Indian Ocean is characterized by the limitation or the obstruction imposed by Sumatra and Sri Lanka. This is to say that in order for Indian Ocean swells to reach Phuket, they must pass through *The Great Channel*, a swell window limited from roughly 235 degrees west-southwest through 250 degrees west-southwest. Thus the swell window for Phuket to receive waves from the Indian Ocean is approximately 15 degrees or less. Figure 3.3 illustrates the Indian Ocean swell window for Phuket, Thailand.

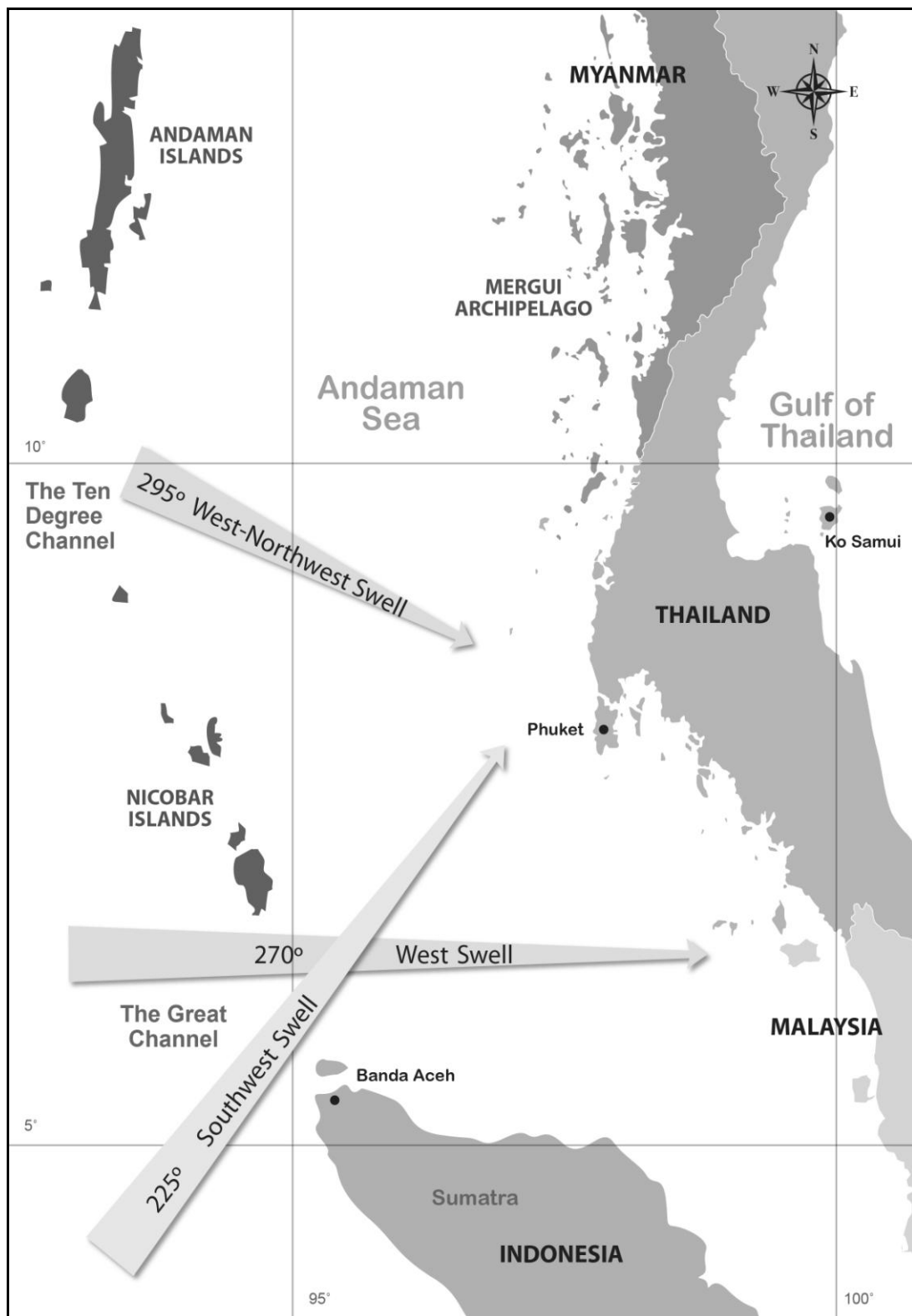
However, in a regional context, Thailand’s Andaman Coast has a wider swell window, especially to waves generated in the northern Indian Ocean and southern portion of the Bay of Bengal. Figure 3.4 illustrates the regional swell window for Andaman Coast, Thailand, and indicates the potential for westerly swell directions in the region.

Figure 3.3 Indian Ocean Swell Window for Phuket, Thailand



Source: Author

Figure 3.4 Regional Swell Windows for the Andaman Coast, Thailand



Source: Author

If taking into account the regional surf-generating storm activity, including cyclones, the swell window increases to include between 225 degrees southwest through 295 degrees west-northwest, although the Nicobar-Andaman Archipelago form a considerable barrier whereby waves must pass through *The Great Channel* or *The Ten Degree Channel* to enter the Andaman Sea. Indeed the more westerly the swell direction, the more probable that wave activity can pass through The Great Channel and directly affect the Andaman Coast and the southern provinces of Krabi, Trang, and Satun. Worthy of note, The Great Channel is much deeper and wider as compared to The Ten Degree Channel.

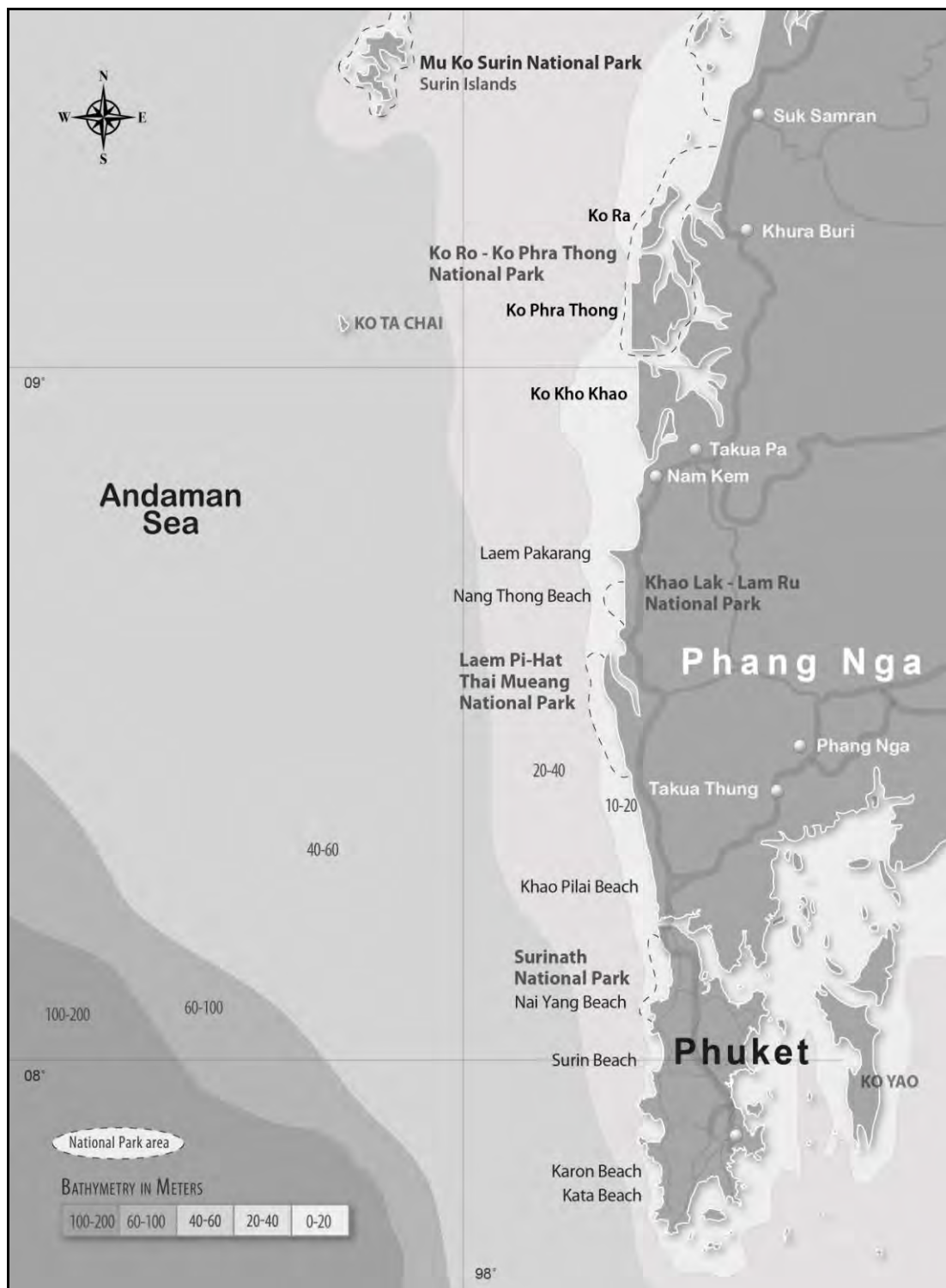
3.2.3 Andaman Coastal Bathymetry

This research indicates that bathymetry (seafloor topography) varies at different latitudes along Thailand's Andaman Coast and this may affect wave speeds and heights. Waves approaching a particular coast from deep water travel faster than waves approaching over shallow water, such as when they are passing over a continental shelf before reaching the shore. Notably, the research identifies that the deepest water on Thailand's Andaman Coast is found near Phuket; hence Phuket has the best waves regardless to the fact that provinces to the north have a better swell window to the southern Indian Ocean. As the continental shelf is wider to the north and south of Phuket, relationally the sea depth along the Andaman coast decreases progressively in latitudes north and south of Phuket. Limpsaichol (1992) notes that the all Andaman provinces have a narrow sea shelf, which is about 108 km wide in the north (Ranong Province), narrows down to 27 km in the middle (Phuket Province) and widens again to about 130 km in the south (Satun Province). However, offshore islands, such as the Surin Islands of Phang Nga province and Ko Phayam Island in Ranong province have deeper coastal waters than those compared to the continental coast and may experience more significant wave heights. Specific water depths are not provided in this study per se, rather they are indicated and described in general context. Figure 3.5 identifies the coastal bathymetry along the Andaman Coast, whereby the location water depths of up to 100–200 meters are given.

Tides

Tides along Thailand's Andaman Coast are semi-diurnal, meaning there are two high tides and two low tides daily with spring heights of up to 2.4m (8ft) and neap data down to 0.9m (3ft) (Sutherland, 2009). Reef breaks along the Andaman Coast were found to be highly 'tide dependent', requiring a mid to high tide in order to be 'surfable'. This is to say that on low tide these areas may become exposed reefs and are 'unsurfable'. This is a limiting factor to the capacity and availability of surfing waves at given areas.

Figure 3.5 Bathymetry of the Andaman Coast



Source: Author

3.2.4 Andaman Wave Types and Directions

Waves arriving on the Andaman coast were found to be coming from a range of sources and directions, and a range of wave types are generated by particular sets of weather phenomena. Depending on how and where the waves are propagated, results for when, where, and the type of surfing waves which arrive at various Thai coastal areas may differ significantly.

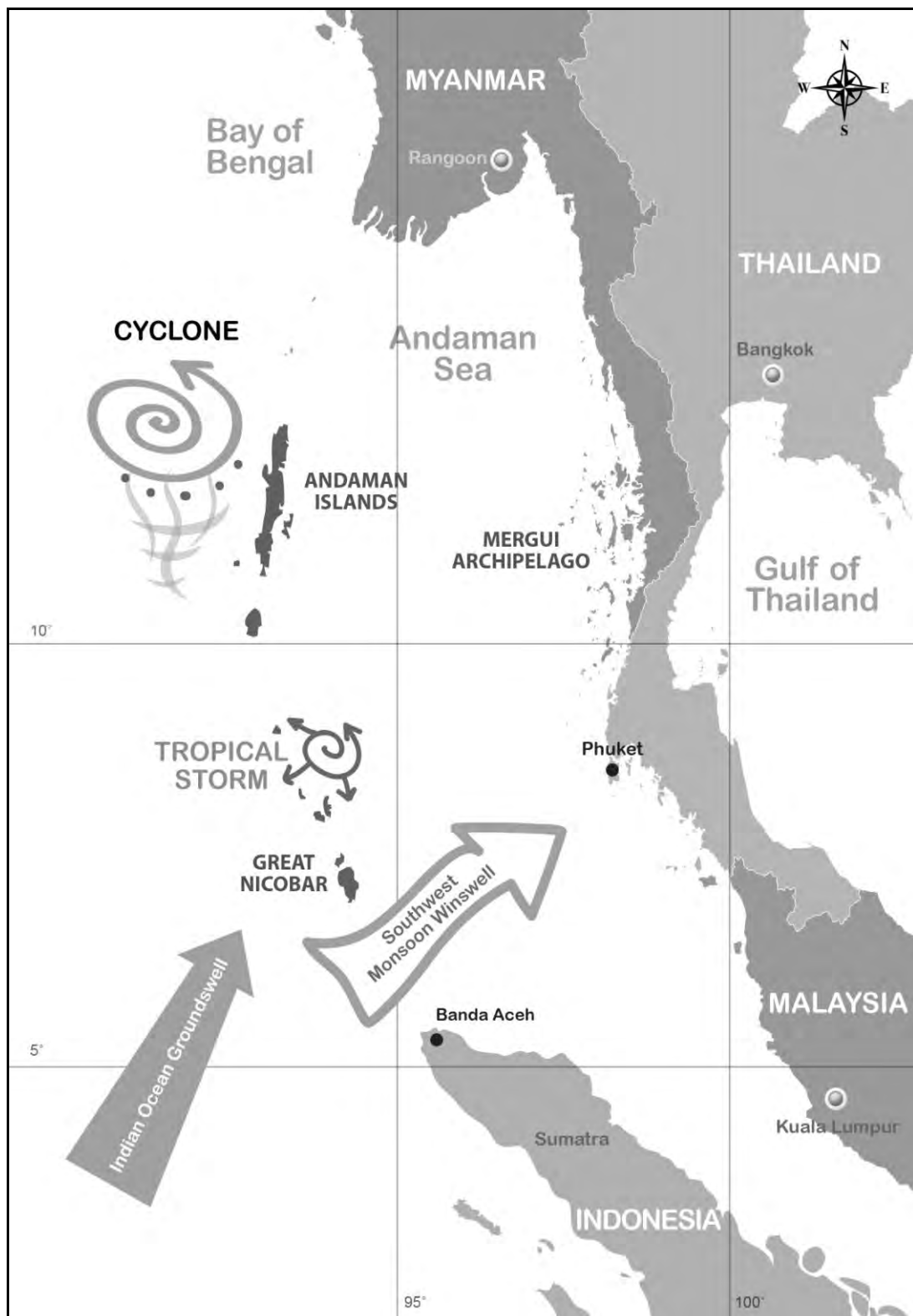
In the widest sense, waves were generated either nearby the coast or far away from the coast. Waves resulting from weather patterns which occur near the Andaman Coast generally create a ‘windsea’ condition. As mentioned in the definition of terms, ‘windsea’ refers to waves accompanied by the wind which generated them and results in mixed wave heights. However, the windsea condition may pass, leaving a windswell for several hours or several days. In stark contrast, groundswells generated by weather systems in the Indian Ocean may travel great distances and pass through the swell window associated with The Great Channel.

Three sources of ocean swell and associated swell directions have been identified and outlined corresponding to Figure 3.6 (Note that for practical reasons, Figure 4.6 and references to cyclonic activity discussed herein have been generally divided into cyclones and tropical storms).

- Monsoonal wind flow which propagates southwesterly to westerly windswells and windsea.
- Groundswell generated in the southern or central Indian Ocean which produces southwesterly swells.
- Regional cyclonic activity, including tropical depressions, storms, and cyclones, which may propagate a variety of swell types and directions.

Each type of weather phenomena and its associated swell type and direction create various surfing conditions on the Andaman Coast that may range in size and ‘surfability’ from one coastal area to another. As mentioned, swell direction is highly relevant and significant in the findings, given the swell window for each province varies considerably. The provinces north of Phuket are more exposed to a southerly or southwesterly swell direction, while provinces south of Phuket are mainly exposed to westerly swell directions or rarely occurring northerly directions.

Figure 3.6 Sources of Surfing Waves Significant to Thailand's Andaman Coast



Source: Author

As aforementioned and primarily a factor of geography, Sumatra blocks or shadows the vast majority of swell energy (the high surf) occurring in the Indian Ocean from reaching Thailand's Andaman seaboard. Consequently, the surf on Thailand's Andaman Coast is normally just a fraction of that occurring on the southern-facing coast of Sumatra and the Mentawai Islands which are highly exposed to the wider Indian Ocean.

This research moves to describe the three distinct weather phenomena which propagate surfing waves for the Andaman Coast. Significant to the results described herein, this research is not intended to offer meteorological data or a hypothesis on how, why, or weather systems generate; rather the weight of the findings are focused on swell directions and the types of waves, e.g. where the waves are coming from and consequently where (which provinces) they arrive. Correspondingly, the types of waves and associated weather phenomena relevant to surfing on the Andaman Coast are presented.

3.2.4.1 Southwest Monsoon Windswell

This research has identified that the majority of surfing waves arriving on Thailand's Andaman Coast are indeed associated with short-period swell propagated by the southwest monsoon and occurring as windswell or windsea condition. While both weather conditions are associated with the monsoon, e.g. strong southwesterly winds, windswell has a fairly even wave height and period when compared to windsea, which has irregular wave heights and periods among waves and may be associated with localized rain and thunderstorm activity (See Appendix F: Southwest Monsoon Windswell).

Comparatively, windswell is commonly understood among surfers as less favorable for surfing compared to groundswells, as windswell is more often than not synonymous with waves arriving close together (short-period swell) as well as less than ideal weather conditions. However, windswell and windsea offer surfers an opportunity to catch a lot of waves in a short amount of time. For example, comparing Thailand's windswell with the quality groundswell in Bali, Indonesia, surf tourist K. Ida (2009 personal communication) put it this way, "Bali has big waves and great conditions, but you may find that there is a limit to how many waves you catch in a given day due to the intense crowds of experienced surfers, but when surfing the windswell in Phuket, you can catch wave after wave after wave." This is to say that the frequency of the waves during the monsoon is relevant to the discussion on recreational surfing and surf tourism on the Andaman Coast.

Westerly swell direction

In a regional context, the ‘jet stream’ or other atmospheric conditions may influence the southwest monsoonal windflow to some degree, bending it toward the west and the Thai coast. Regardless of the corresponding phenomena that produce the southwest monsoon, this research found that the wind and waves generated often have a high degree of west. The significance of the westerly angle includes the potential spreading of the swell into the southern end of the Andaman Sea and toward the provinces of Krabi, Trang, and Satun. Furthermore, Blauer (2009 personal communication) hypothesizes that the southwest–west/west wind flow may steer wave activity toward southern provinces, while the shadowing affect of Sumatera may offer some degree of protection from the stormy seas associated with the monsoon. Indeed select areas in the provinces located south of Phuket receive some degree of windswell from the monsoon windflow, but to what degree and wind type require future exploration of the area.

3.2.4.2 Indian Ocean Groundswell

Groundswells generated by storms in the Indian Ocean produce a southerly or southwesterly swell direction. As aforementioned, for these swells to reach Phuket they need to pass through the swell window between Banda Aceh, Sumatra and the island nation of Sri-Lanka and enter the Andaman Sea through The Great Channel (see Figure 3.3). Therefore, ocean swells generated near Madagascar and traveling across the entire Indian Ocean are at the correct degree or angle to reach Phuket’s shores and can produce high quality surfing waves (See Appendix F: Indian Ocean Groundswell).

Several sources, such as Sutherland (2009) and others on the internet, indicate that as the swell window is wider (more open) in provinces north of Phuket compared with those provinces south of Phuket; thus it has been logically assumed that the groundswells originating in the Indian Ocean would be progressively larger on a given day the further north the coastal area lay. However, this is not entirely the case, and the results of this research indicate that in the case of the Andaman Coast of Thailand, there are at least five key factors affecting groundswells for surfing. Although the following five points may be true for all swell types, they are particularly relevant to the discussion on groundswells arriving on Thailand’s Andaman seaboard, which travel from outside the region and are adversely affected by locally occurring weather conditions:

- In accordance with the literature and internet sources, the swell window is wider for the coastline north of Phuket.
- The seafloor depth (bathymetry) is progressively shallower and the continental shelf is gradually wider to the north of Phuket which slows and weakens approaching groundswells (groundswells move through the sea at a greater depth than other swell types and are more responsive to bathymetric changes than other swell types).
- Exposure to winds, especially unfavorable winds from the southwesterly through westerly direction. Coastal areas north of Phuket may be especially prone to disturbance by these winds.
- Southwesterly groundswells may radiate eastward to some degree as they 'refract' around Banda Aceh and bend toward coastal areas that would otherwise be sheltered (as an example of refraction, whilst a very different type of wave, the 2004 Indian Ocean tsunami hit Thailand's southern provinces although the waves were generated on the opposite side of Sumatra from Thailand).
- Islands located at different distances from shore which may lie in deeper waters and have unique currents which can have an effect on the waves.

In the first context, the researcher found no evidence to support that groundswells produce waves which are better or bigger to the north of Phuket in general, yet anecdotal evidence supports that groundswell activity is comparably minimal south of Phuket (this research determines that provinces south of Phuket are indeed shadowed from most, but not all, Indian Ocean groundswell activity). However, for the provinces north of Phuket, this study offers the following results: indeed the northern provinces of Phang Nga and Ranong are more open to groundswells, however, as previously mentioned, seafloor topography is a mitigating factor. Through conducting cell phone communication with other surfers during periods of groundswell activity between Phuket and Phang Nga it was found that waves were generally larger in Phuket and at given point in time. As an exception, surfing sites at select coastal areas (especially islands) are likely to be somewhat relative in size at a given point in time.

Groundswell and the southwest monsoon

Significant to the findings in this research is the extent of groundswell activity overlapping with the southwest monsoon. Blauer (2009 personal communication) used data from surf forecasting company *surfline* to overlay swell types, namely windswell and groundswell, which often occur at the same time, and found that over a two-year period the groundswells were highly disturbed or disrupted by the windswell. This indicates that the predominantly southwesterly monsoon windswell ‘cancelled out’ the groundswell. Taken as a whole, this study suggests that groundswell constitutes approximately 50% of the total available year-round wave activity and this groundswell activity would be evident if indeed the region did not experience the southwest monsoon; and given that coastal Thailand is under the influence of the southwest monsoon during the height of groundswell activity in the Indian Ocean (approximately June through September), potential surfing waves resulting from the groundswell wave activity are adversely affected. Provinces to the north of Phuket were found to be highly vulnerable to the dominate monsoonal windflow and therefore groundswell activity was more susceptible to this phenomenon.

Furthermore, groundswell may arrive at the coast mixed with the southwest monsoonal windswell. Groundswells mixed with windswell may be hidden or ‘masked’ with implications for ocean safety on Andaman beaches; they may produce ‘flash’ rip currents that initiate after groundswells ‘run-up’ the beach and return as backwash (groundswells generally have a higher run-up than windswell). See section 3.4.1 (Waves, Winds, and Ocean Safety in Phuket) for additional findings.

Groundswell and the high season (November–April)

This research identifies that when the southwest monsoon winds subside, groundswells may arrive without any wind-related disruption. During this pattern, several beaches in Phuket, namely Kata Noi and to some extent Nai Harn Beach, along with Laem Pakarang (in Phang Nga Province) and Ao Yai Beach on Ko Phayam (in Ranong Province) received swell of somewhat equal size. This is especially dynamic in the context of the region’s high season (November through March) when the southwest monsoon windflow (and associated windswell) is not present over the Andaman Sea. On average, the researcher observed three to five days during each of the high season months (from 2008 through 2010) that a wave height of two to five feet (wave face) occurred at various locations along the Andaman Coast.

3.2.4.3 Cyclonic Storm Swell

Cyclogenesis is a characteristic weather phenomenon dynamic to the Bay of Bengal and the Andaman Sea. Although cyclones are normally associated with a weather phenomena related to the equator, the Bay of Bengal is potentially energetic for the development of cyclonic storms and accounts for about seven percent of the global annual total number of cyclones (Mohanty & Mandal, 2005), including the infamous *Cyclone Nagris* which hit Myanmar on May 2, 2008. Similarly, the Andaman Sea is known for the genesis of many severe cyclones which traverse the Bay of Bengal (Kumar et al., 2008).

Classification of cyclonic activity (counter-clockwise wind activity) varies among international government agencies. In Thai waters, a tropical depression is categorized as a weather system which produces winds up to 59 km/hr; a tropical storm produces winds of 60–119 km/hr; and a cyclone produces winds of over 119 km/hr (WMO, 2007). Herein, the terms tropical depression, tropical storm, and cyclone maybe used interchangeably depending on their strength at a given time. For purposes of clarity, this research will primarily use the term ‘tropic storm’.

Tropical storms in the Bay of Bengal and the Andaman Sea

Tropical storms generated in the Bay of Bengal and the Andaman Sea are propagated by circulating winds and may occur from April through November. Specifically, the months of May and November being especially dynamic for tropical storms to increase in intensity and reach severe tropical storm or even cyclone status (winds over 119 km). Although regional tropical storm activity is associated with the southwest monsoon windflow, they normally track away from the Andaman coast after forming, moving west, northwest, and ultimately to the north. As cyclones spin anticlockwise, they send a swell direction ranging from north to west and depending on the location of the storm, associated swells may be shadowed by the Andaman Islands. Furthermore, cyclones which generate in the Indian Ocean and track northwards into the Bay of Bengal can send large ocean swells toward the Andaman Coast through The Great Channel.

Overall, tropical storms generated in the Bay of Bengal or the Andaman Sea can produce southwesterly through northwesterly swells, including regional groundswells and are highly relevant to the discussion on wave types and direction affecting Thailand’s Andaman seaboard. Unique to the results of this research, cyclonic activity produces uncommon swell directions, such as west/northwest/north with implications for

high surf on Thailand's Andaman Coast, including the southern provinces of Krabi, Trang and Satun. Albeit a measurably rare event, regional tropical storms may produce large northerly swells which can affect, for example, some 51 islands in the archipelago encompassed by the Tarutao Marine National Park in Satun Province.

Regional tropical storms

Tropical storms may generate in the southern or central area of the Bay of Bengal, generate within the Andaman Sea, or move into the Andaman area from the southwest monsoon. Thus, surf generating tropical storm systems may form in various locations ranging from the northwestern tip of Sumatera (west of Banda Aceh) up through the heart of the Andaman Sea between the Andaman Islands and Myanmar. These storms can produce either large stormy waves or as clean high-quality waves for the Andaman Coast. Significant to surfing and depending on the location of the storm, waves generated by these storms needn't pass through 'The Great Channel' or the 'Ten Degree Channel' and therefore may have a direct hit on any or all of the six Andaman provinces. Therefore, the results of this research indicate that there is indeed periodic high-quality westerly swell from region tropical storm activity. For example, tropical storm activity in the southern bay of Bengal produced the clean ocean swell of over ten feet (wave face) during the Kalim Surfing Contest 2008 (July 18–20) (see Appendix F: Regional/Andaman Swell).

3.2.5 Inventory of Surfing Areas by Province

Sixty-one surfing breaks were identified on the Andaman Coast through the researcher's exploratory investigations in the field and are listed in Tables 3.5 through 3.10. As aforementioned, these tables are not exhaustive listings and the research acknowledges the potential to locate new surfing areas in the future. The greater part of field study was conducted by the researcher using a motor vehicle to reach and explore coastal areas. Data collected from interviews with surfers and scattered information on the internet (such as www.saltwater-dreaming.com and wannasurf.com) aided in identifying and locating these areas.

Google Earth technology was used to plot latitude and longitude coordinates as displayed in Tables 3.5 through 3.10 and reflect the 'take off' zone where surfers would position themselves to catch the wave at the 'peak' (the location where the wave first begins to break). In such case, the words 'specific area' has been placed under the

latitude/longitude data. If the coordinates represent an entire beach or section of beach, which may encompass more than one surfing area, the words ‘general area’ were placed under the latitude/longitude data. One area or beach with multiple surfing sites may have more than one entry, such as when there is a rock or reef point extending from a surfing beach. This is significant inasmuch as surfing breaks, especially point and reef breaks, occur in very specific locations and were therefore identified and recorded accordingly. In all cases the most northerly surfing break is listed first.

Tables 3.5 through 3.10 do not offer descriptions of sites in terms of the size of the beach, tourism or other infrastructure, etc.; rather this research is focused on identifying the exact locations of surfing areas. Criteria are placed in four columns: toponym (place name), latitude and longitude, type of wave (i.e. beach, reef or point break), and governance and access. As for the latter, ‘governance’ is relevant to identify if the area is located within National Parks (NP), Marine Protected Areas (MPA) or other management schema, whereas ‘access’ identifies if indeed the access to an area is precarious, such as a hotel which may limit public access to the area.

Given the profound level of tourist development along the Andaman Coast (consider that for example Phuket has over 620 hotels), the researcher has chosen not to include such development or amenity (i.e. hotel names). Similarly, for practical reasons, broad descriptions of the areas, such as length of beaches, etc. has for the most part been excluded. Of particular significance to the comprehensive nature of this research, at the request of informants, several surfing areas have not been disclosed. This is in response to integral agreements with informants not to divulge the location of these difficult to reach areas in exchange for knowledge on the wider topic.

Data concerning the length of each provincial coast was sourced from Alpha Research (2007). The following maps (Figures 3.7 through 3.10) are a result of the research and were generated by the researcher during the field study and designed specifically for this research; they include relevant bathymetric data and identify national park areas. The results of surfing area locations and details in Tables 3.5 through 3.10 are presented beginning from the northernmost site and ending with the southernmost site. Discussions, inclusive of the data in corresponding tables, are presented in Chapter 4.

3.2.5.1 Ranong Province

Ranong is the northernmost province on Thailand's Andaman Coast and at 93.2 kilometers in length it has the shortest coastline of Thailand's six provinces. The exploratory research found that many coastal areas are mangrove forests and seagrass beds and these areas are unsuitable for surfing. Two significant areas identified for surfing are Ao Yai Beach on Phayam Island (Ko Phayam) and to some extent Bang Ben Beach at Laem Son National Park.

Ao Yai Beach on Ko Phayam, with relatively deep water offshore, holds good quality waves, especially from southwesterly groundswells. The beach has perhaps the best swell window for wave activity entering the Andaman Sea from the Indian Ocean. Therefore, this area offers favorable surfing conditions during November to May when southwest monsoon winds are not pervasive. Although Ao Yai Beach does indeed receive wave activity from the southwesterly monsoon, it is also highly susceptible to windy/stormy on-shore wind conditions. Ko Chang (the island north of Ko Phayam) is somewhat blocked from wave activity from the south and southwest by Ko Phayam, yet 'surfable' conditions have been identified there.

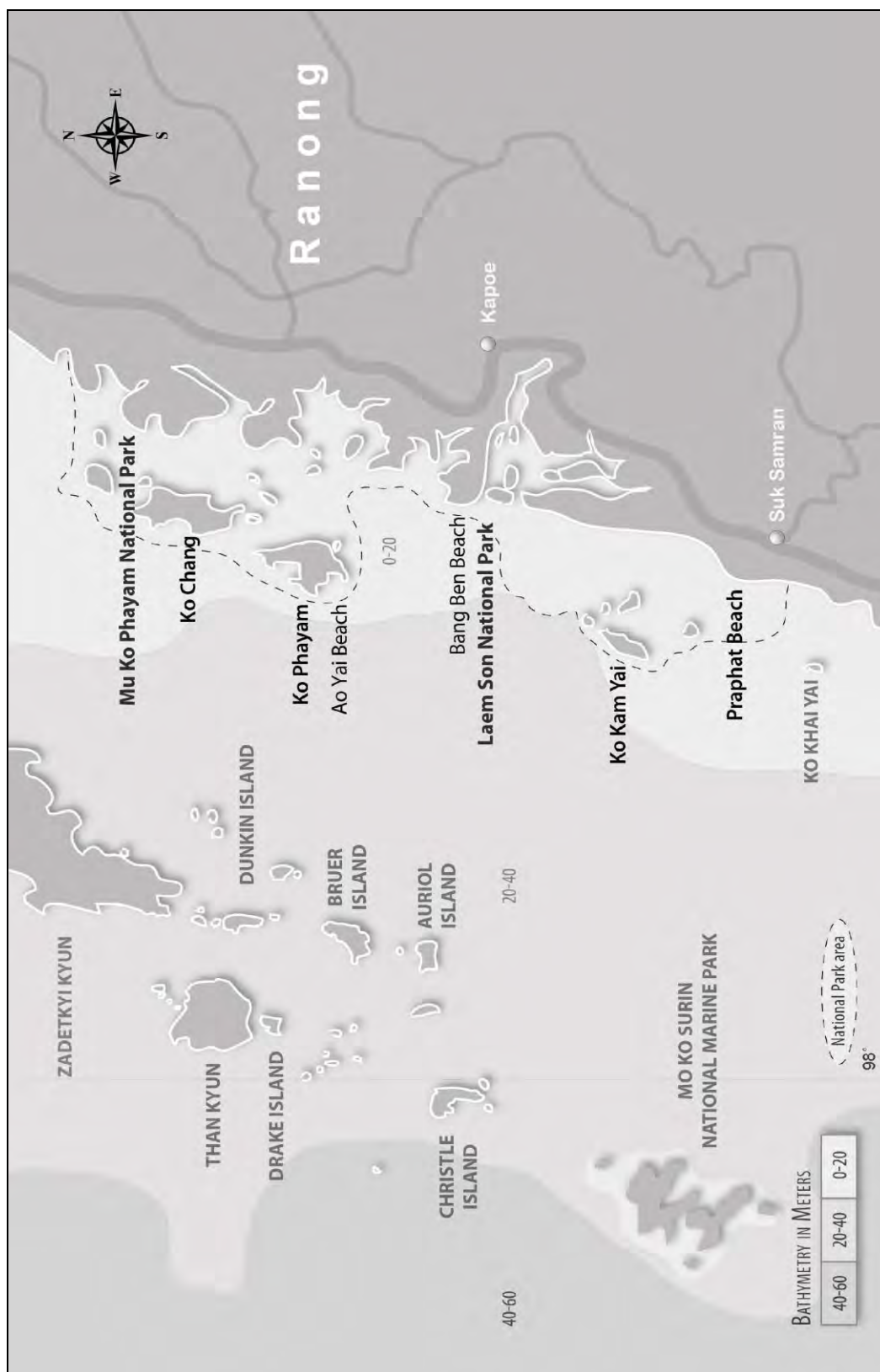
Bang Ben Beach and surrounding areas in the Laem Son National Park area receive wave activity and are indeed 'surfable', however, given the local bathymetry associated with the wide continental shelf, waves are usually spilling breakers (gradually breaking waves) which are less than ideal for surfing.

Table 3.5 Surfing Areas of Ranong Province

	Toponym (and detail)	Latitude / Longitude	Type	Governance / Access
1	Ao Yai Beach	9°43'4.55"N 98°23'37.62"E (specific area)	beach break	Laem Son National Park [MPA]
2	Bang Ben Beach	9°36'25.61"N 98°27'44.98"E (general area)	beach break	Laem Son National Park [MPA]
3	Laem Son	9°31'29.22"N 98°26'34.77"E (general area)	beach break	Laem Son National Park [MPA]

Source: Author

Figure 3.7 Surfing Areas and Bathymetry of Ranong Province



Source: Author

3.2.5.2 Phang Nga Province

The 216.2-kilometer Phang Nga coast is the longest provincial coastline along Thailand's Andaman seaboard. Phang Nga has more than twenty identifiable surfing areas which are mainly clustered together in the Khao Lak area, namely Laem Pakarang (Cape Coral) collectively with the Nan Thong Beach area. Similarly, the Na Tai pier area, just north of Phuket, has a cluster of surfing areas. Other areas for surfing include several beach breaks on Ko Ra, Ko Phra Thong and Ko Khao. Table 3.6 provides an inventory of Phang Nga surfing areas.

As aforementioned, although the Phang Nga coast has a wider swell window to receive wave activity from the south and southwest, the coast is more exposed to unfavorable winds and has a wider continental shelf (shallow waters offshore which reduce wave speeds and power). The wide and gradual grade in bathymetry are indeed what exacerbated the 2004 Indian Ocean tsunami, serving as a long and measured ramp, allowing the large waves to push much farther inland than in Phuket (as the first wave laid a blanket of water over the land, the second wave traveled on top of the first and thus penetrated much further inland). In point of fact, this coastal topography is less favorable for surfing waves when compared with the deeper waters near Phuket. From the perspective of the surfer, the waves in the Khao Lak are less 'punchy' (powerful) than those found in Phuket.

Notably, the results of the coastal assessment indicate that the beaches in the Nan Thong are best for surfing during the short-period wave activity associated with windsea and windswell during the monsoon, while the surfing areas around Laem Pakarang have better shape and form when wave activity associated with groundswells occur. The Pakarang area is highly susceptible to westerly winds, which make surfing in the area less than favorable.

Blauer (2009 personal communication) conducted exploratory research to Surin Islands and offers a hypothesis that there is indeed potential for the discovery of surfing areas in the island chain. However, due to research limitations resources, such as difficulties in travel to the area during the monsoon, the area has yet to be methodologically explored for surfing.

Table 3.6 Surfing Areas of Phang Nga Province

	Toponym (and detail)	Latitude / Longitude	Type	Governance / Access
1	Surin Islands	9°26'42.98"N 97°51'26.14"E (general area)	<i>inconclusive results</i>	Mu Ko Surin National Park
2	Ko Ra	9°12'53.36"N 98°16'31.74"E (general area)	beach breaks	Public access (boat)
3	Ko Phra Thong	9° 4'49.31"N 98°14'31.21"E (general area)	beach breaks	Public access (boat)
4	Ko Kho Khao	8°56'32.62"N 98°15'15.17"E (general area)	beach breaks	Public access (car ferry)
5	Cape Pakarang (the Corner)	8°44'35.60"N 98°13'3.25"E (specific area)	point break over coral deposits	Public access
6	Cape Pakarang (the Tree)	8°44'18.71"N 98°13'0.61"E (specific area)	reef break	Public access
7	Cape Pakarang (Taxi Dave's)	8°43'26.27"N 98°12'58.93"E (specific area)	point/reef break	Public access
8	Cape Pakarang (beach break)	8°43'16.28"N 98°13'45.27"E (specific area)	beach break	Public access
9	Khuk Khak Beach	8°41'28.22"N 98°14'18.94"E (specific area)	beach break	Public access
10	Bang Niang Beach	8°40'25.74"N 98°14'23.02"E (specific area)	beach break	Public access
11	Nang Thong Beach (north of lighthouse)	8°38'35.72"N 98°14'42.39"E (specific area)	beach break	Public access
12	Nang Thong Beach (outside of lighthouse)	8°38'32.09"N 98°14'35.72"E (specific area)	beach break	Public access
13	Nang Thon Beach (south of lighthouse)	8°38'27.68"N 98°14'42.17"E (specific area)	beach break	Public access
14	'Mystos'	8°36'36.42"N 98°13'59.18"E (general area)	reef/rock	Access through Merlin Hotel
15	North of Na Tai (small bridge)	8°16'59.06"N 98°16'25.12"E (specific area)	beach break	Public access
16	Na Tai Pier (north side)	8°16'24.79"N 98°16'31.76"E (specific area)	beach break	Public access
17	Na Tai Pier (south side)	8°16'20.88"N 98°16'32.94"E (specific area)	beach break	Public access
18	Na Tai (rock/reef break)	8°16'15.38"N 98°16'29.25"E (specific area)	rock/reef break	Public access

Source: Author

Figure 3.8 Surf Areas and Bathymetry of Phang Nga Province



Source: Author

3.2.5.3 Phuket

Data and details provided for Phuket are comparatively extensive in this research given that Phuket has been identified as being the most significant province for surfing in Thailand in term of both the quantity and the quality of waves. Table 3.7 (Surfing Areas of Phuket Province) provides the results of the coastal assessment as an inventory of the significant surfing breaks in Phuket. Twenty-nine surfing areas were identified, and the actual number of surfing breaks is somewhat higher given that some beaches may have more than one site depending on the particular swell directions and tides. When appropriate, Table 3.7 identifies specific areas, while general areas may represent an entire beach with more than one site.

As aforementioned, Phuket has the most favorable bathymetry and coastal topography to produce quality surfing waves in Thailand, and this is especially the case in the southern quadrant of the island. Water depths near Karon, Kata, Kata Noi, and Nai Harn beaches are approximately 0–20 meters inshore, 20–40 meters just off shore, and 40–60 meters farther out to sea (Figure 3.9 Surfing Areas and Bathymetry of Phuket). In addition, as the predominate swell direction is southwest through west, offshore coastal waters are especially deep relative to all other provinces on the coast, with water depths of 60–100 meters giving way to 100–200 meters (see Figure 3.5 Bathymetry of the Andaman Coast). Therein, this research finds that water depths around Phuket, especially the southern beaches, as the most plausible explanation for the island having the best quality surfing waves in Thailand. Correspondingly, this helps to explain why ocean currents are especially strong in Phuket relative to other provinces and is consequential to ocean safety.

To some extent, the best surfing areas are clustered in Phuket. For example, the Nai Yang Beach area located within the Sirinat National Park has several off shore reefs (see Figure 4.1 Surfing Areas of Nai Yang). The reef on the north side of the bay (Table 3.7, surf site # 5), although highly susceptible to monsoon winds, picks up groundswell and can have quality waves during the high season. Other areas which are clustered together include the Pansae/Surin/Laem Sing beaches and the Karon/Kata/Kata Noi beaches. The results of this study identify the reef point at Nai Yang (Table 3.7 surf site #7), identified by local surfers as “The Island” and the reef point at Kalim Beach (Table 3.7, surf site # 21), have the highest quality surfing waves in Phuket. The significance of these areas in terms of their conservation is discussed in Chapter 4.

Table 3.7 Surfing Areas of Phuket Province

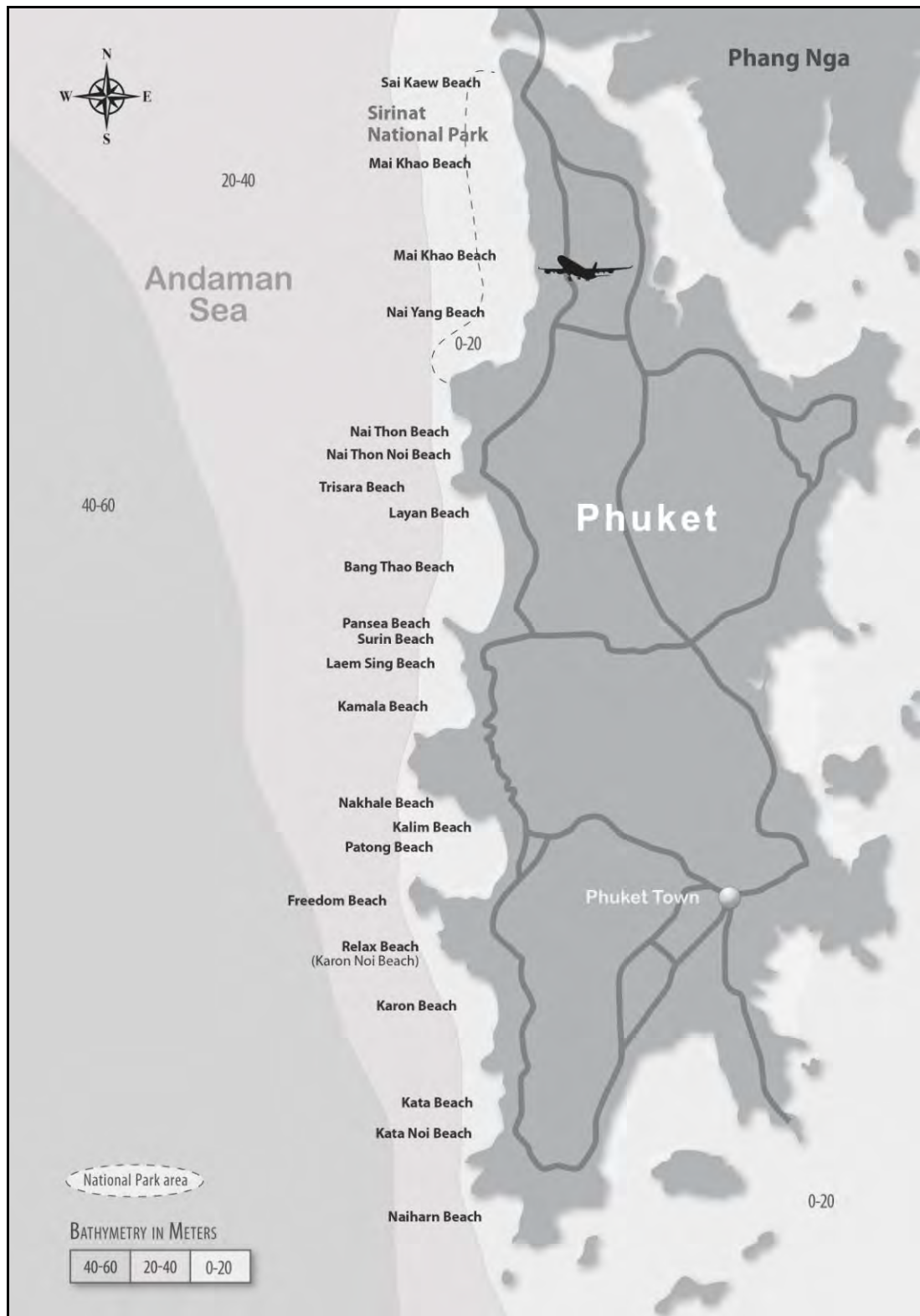
	Toponym (and detail)	Latitude / Longitude	Type	Governance / Access
1	Sarasin Sand Banks	8°11'55.00"N 98°16'39.19"E (specific area)	offshore sandbanks	Public access
2	Sai Kaew Beach	8°11'41.56"N 98°16'58.58"E (specific area)	beach break [rights]	Sirinat Marine National Park [MPA]
3	Sai Kaew Beach	8°11'3.19"N 98°17'17.59"E (specific area)	beach break [rights/lefts]	Sirinat Marine National Park [MPA]
4	Mai Kao Beach	8°9'56.32"N 98°17'32.95"E (general area)	beach breaks	Sirinat Marine National Park [MPA]
5	Nai Yang (middle reef) (‘Parking lots’)	8°5'59.47"N 98°17'31.52"E (specific area)	reef break [rights/lefts]	Sirinat Marine National Park [MPA]
6	Nai Yang (beach break)	8°5'37.24"N 98°17'51.99"E (specific area)	beach break [rights/lefts]	Sirinat Marine National Park [MPA]
7	Nai Yang (reef point) (the ‘Island’)	8°5'22.11"N 98°17'18.99"E (specific area)	reef point break [lefts]	Sirinat Marine National Park [MPA]
8	Nai Thon	8°3'31.55"N 98°16'34.88"E (general area)	beach breaks [rights & lefts]	Public access
9	Nai Thon Noi	8°2'49.45"N 98°16'37.39"E (general area)	beach breaks [rights & lefts]	Access through Andaman White Hotel
10	Trisara Beach	8°2'8.18"N 98°16'29.83"E (general area)	beach breaks [rights & lefts]	Access through Andaman Trisara Resort
11	Layan Beach	8°1'41.49"N 98°17'8.37"E (general area)	reef & beach breaks [rights & lefts]	Public beach park
12	Bang Tao: Ao Le Phang [north] Ao Bang Tao [south]	8°0'35.01"N 98°17'22.54"E (general area)	beach breaks [rights & lefts]	Public access
13	Pansea Beach	7°59'1.25"N 98°16'24.48"E (specific area)	reef/rock point break [rights]	Access through Amanpuri Hotel
14	Pansea Beach	7°58'54.18"N 98°16'35.02"E (general area)	beach break [rights & lefts]	Access through Amanpuri Hotel

Table 3.7 (Continued)

15	Surin Beach	7°58'31.34"N 98°16'40.70"E (general area)	beach break [rights & lefts];	Public beach park
16	Laem Sing	7°58'7.76"N 98°16'44.58"E (general area)	beach breaks [rights & lefts].	Two public trails
17	Kamala Beach	7°57'46.61"N 98°16'52.09"E (specific area)	point break [rights]	Public access
18	Kamala Beach	7°57'39.95"N 98°16'59.03"E (general area)	beach breaks [rights & lefts]	Public access
19	Nakhale Beach	7°55'28.06"N 98°16'25.25"E (general area)	reef/beach breaks	Access through Thavorn Beach Village
20	Kalim 'The Point'	7°54'52.51"N 98°17'23.20"E (specific area)	reef break [rights]	Public access
21	Kalim Reef	7°54'42.69"N 98°17'28.78"E (specific area)	reef break [rights & lefts]	Public access
22	Patong Beach	7°54'12.36"N 98°17'45.72"E (general area)	beach breaks [rights & lefts]	Public access
23	Freedom Beach	7°52'29.61"N 98°16'29.01"E (general area)	beach breaks [rights & lefts]	Access by dirt road / trail
24	Karon Noi Beach [Relax Bay]	7°51'51.82"N 98°16'55.41"E (general area)	reef / beach breaks [lefts and rights]	Access through Le Meridien Phuket Resort
25	Karon Beach	7°51'2.63"N 98°17'29.28"E (specific area)	beach break [rights & lefts]	Public access
26	Kata Yai Beach	7°48'52.73"N 98°17'54.69"E (specific area)	beach break [rights & lefts]	Public access
27	Kata Noi Beach	7°48'32.46"N 98°17'53.14"E (specific area)	beach break [rights & lefts]	Kata Thani Resort
28	Nai Harn Beach	7°46'38.13"N 98°18'14.41"E (specific area)	beach break [rights & lefts]	Public beach park
29	Nai Harn Beach	7°46'24.27"N 98°18'22.23"E (specific area)	beach break [rights & lefts]; left wedge and barrel	Public beach park

Source: Author

Figure 3.9 Surfing Areas and Bathymetry of Phuket



Source: Author

3.2.5.4 Krabi, Trang, and Satun

Surfing areas in Krabi, Trang, and Satun are very limited in terms of the number of surf sites and in the frequency of days with surfable waves. Furthermore, nearly all areas are located on islands which require travel by small private boat, save for Ko Lanta which has large car ferry that operates daily.

Krabi

The Krabi coastline, located southwest of Phuket, is 166.2 kilometers long. Surfing waves in Krabi were found on the west-facing coastlines of two islands, Ko Lanta Noi and Ko Lanta Yai. The western coast of Ko Lanta Yai southward to Laem Tanot at the southernmost point of the island receive swell through a narrow swell window of approximately 30 degrees (240 degrees southwest through 270 degrees west) (see Figure 3.4). When monsoon winds or Andaman storms produce swell with a high degree of west, the Ko Lanta area receives ‘ridable’ surf. Throughout exploratory research to the area during periods of southwesterly groundswell, waves were found to be somewhat smaller when compared to Phuket (approximately half of the size) at the same point in time. Anecdotal evidence suggests that a higher degree of west would result in larger wave heights in the Ko Lanta area.

Laem Tanot, Ko Lanta Marine National Park, on the extreme southern tip of Ko Lanta Yai, supports an area of coral reef which can be surfed on mid to high tides. Other areas for surfing may appear briefly on mid to high tides along the west coast of Ko Lanta Yai depending on the swell direction. When compared with Phuket, the Ko Lanta coastline is less favorable for surf as it lacks the necessary ‘set ups’ to produce quality waves and the coastal bathymetry is unfavorable. Access to Ko Lanta by car ferry makes the area reachable during the southwest monsoon season (in contrast to various islands in neighboring provinces of Trang and Satun).

Trang

The Trang coastline 119.2 kilometers long. According to Williams (2008) Trang means ‘big wave’, however the researcher found no evidence to support this claim in Thai or in the various Malayo-Polynesian languages used in local place names. Three islands are of particular interest in the Trang area: Ko Ngai, Ko Muk and Ko Kradan. Ko Ngai and Ko Kradan are small islands with coral reefs. Similar with the Ko Lanta area, a

narrow swell window allows ocean swells from approximately 240 degrees southwest through 270 degrees west (see Figure 3.4). However, given the slightly more favorable bathymetry of insular coastal areas, anecdotal evidence indicates that surfing waves are potentially better than those found in Ko Lanta on a given day. A westerly swell direction is most favorable.

Problematically, travel to these islands in the off season necessitates finding a private boat, which poses challenges given that the surfing season is synonymous the monsoon season when fishermen are hesitant to face stormy seas. Therefore, access is a key issue for surfing in insular Trang. At the time of writing, the researcher was unable to travel to these islands during periods favorable for surfing. However, reports from tourists and fishermen indicate that these areas do indeed receive swell activity (Blauer, 2009 personal communication; saltwater-dreaming.com). Although not listed in Table 3.9, Trang province encompasses many small islands and reefs with potential for surfing waves.

Satun

The Satun coastline is 144.8 kilometers long and encompasses more than 50 islands. Surfing waves have been reported to the researcher at Ko Tarutao National Park which has islands with west and northwest facing beaches (Blauer, 2009 personal communication). Ao Phante Malaka (Turatau Island) has a long, sweeping west-facing beach. Interviews with Thai fishermen indicate that waves of two meters occur here (ibid.). Blauer (ibid.) hypothesizes that windswell generated during the southwest monsoon, particularly from a westerly direction, may produce surfing waves in the Ao Phante Malaka area, while sea conditions may remain favorable for surfing (i.e. minimal on-shore winds) due to the sheltering affect from Sumatera.

Ko Rawai has a string of north-facing beaches and anecdotal evidence supports that surfing waves may occur here on rare northwest swells. In any given year, tropical storms located near the Andaman Islands may produce northwesterly ocean swells resulting in wave activity along west and north-facing beaches in the insular Satun province. On the southern coast of Ko Adang, there are west-facing beaches which may pick up southwesterly swell, especially groundswell. Lastly, and of particular interest, Ko Bulon Le has west to northwest facing beaches with potential for point and reef breaks.

Access to the area is limited due to the closure of the Koh Petra National Park during the monsoon season, and the researcher was unable to explore this are first-hand.

Table 3.8: Surfing Areas of Krabi Province

	Toponym (and detail)	Latitude / Longitude	Type	Governance / Access
1	Lang Son beach	7°40'47.95"N 99° 2'8.61"E (general area)	beach break	Public access
2	Klong Dao Beach	7°38'24.29"N 99° 1'29.96"E (general area)	beach break	Public access
3	Ko Lanta Yai (southern beaches)	7°29'9.69"N 99° 4'22.04"E (general area)	beach break + potential reef/rock breaks	Ko Lanta Marine National Park [MPA]
4	Laem Tanot	7°28'4.91"N 99° 5'44.56"E (specific area)	reef break	Ko Lanta Marine National Park [MPA]

Source: Author**Table 3.9:** Surfing Areas of Trang Province

	Toponym (and detail)	Latitude / Longitude	Type	Governance / Access
1	Ko Ngai	7°23'58.16"N 99°12'1.22"E (specific area)	reef breaks	Hat Chao Mai National Park [MPA]
2	Ko Muk	7°21'33.90"N 99°17'36.41"E (specific area)	beach break	Hat Chao Mai National Park [MPA]
3	Ko Kradan	7°19'25.39"N 99°14'46.09"E (specific area)	beach break + potential reef/rock break	Hat Chao Mai National Park [MPA]

Source: Author**Table 3.10:** Surfing Areas of Satun Province

	Toponym (and detail)	Latitude / Longitude	Type	Governance / Access
1	Ko Bulon Le	6°50'0.15"N 99°31'51.39"E (specific area)	beach break + potential reef/rock break	Koh Petra National Park [MPA]
2	Ko Turatao	6°41'4.92"N 99°38'18.97"E (general area)	beach breaks	Mu Ko Turatao National Park [MPA]
3	Ko Turatao	6°34'28.58"N 99°36'37.36"E (general area)	reef/rock break	Mu Ko Turatao National Park [MPA]
4	Ko Rawai	6°34'51.03"N 99°12'44.95"E (general area)	beach breaks + potential reef/rock break	Mu Ko Turatao National Park [MPA]

Source: Author

Figure 3.10 Surfing Areas and Bathymetry of Krabi, Trang, and Satun



Source: Author

3.3 Water Quality Assessments

The surf tourist survey conducted by the researcher at Kata Beach indicated that water quality was of concern to surfers (Martin & Assenov, 2008). As aforementioned in Section 3.1, 57% of the surf tourists interviewed identified that beach trash (marine debris) was unattractive or of concern. Martin (2009) explored Phuket and Phang Nga provinces and provides anecdotal evidence indicating that a number of water quality issues exist relevant to the surfer, categorizing them as two-fold: rubbish (marine debris) and pollution (dissolved). The results offered in this section offer detailed definitive outcome for the researcher's field work (Martin, 2009) which continued into 2010. In the widest sense, during the southwest monsoon season, water quality was found to degenerate (comparative to the 'high' tourist season when the climate and seas are calm and clear), especially after rainy periods, becoming brownish in color or unpleasant in odor, while marine debris, especially plastic bags, were pervasive in surfing areas. These issues vary widely from one beach to another and may be attributed to a variety of reasons. However, a definitive beach to beach survey of water quality issues is beyond the scope of this assessment; rather this research offers the general findings for Phuket and Phang Nga provinces.

3.3.1 Water Pollution

The researcher identifies that discoloration of water in Phuket and Phang Nga provinces (Andaman Sea) is attributed primarily to water runoff and canal discharges which occur at a number of beaches and surfing areas. Waters in these areas tend to clear up in several days after the heavy rains. On the whole, Phuket beaches appear to have better water quality than those in Phang Nga province (to the north of Phuket) which are earmarked as having brown water during the surf season. Brown water, especially if having an unpleasant odor, makes such areas less attractive for surfing, and reports of surfers getting ear infections have been reported (Blauer, 2008 personal communication; Raab, 2010 personal communication; Aiyarak, 2009 personal communication).

The SEPF (1988) asserts that water quality problems are associated with waste disposal at hotels, bungalows, and restaurants. Dunbar (2009 personal communication) acknowledges that the topic of water pollution from hotels currently under review by the Thai government, not-for-profit organizations, and hotel owners. Organizations, such as SAMPAN (Strengthening Andaman Marine Protected Areas

Networks) are working toward improving ‘enviro-systems’ at hotels, such as waste water. Hotels over 80 rooms need to have waste treatment facility and smaller hotels are not required, and many hotel owners in Phuket and Phang Nga are very concerned about the environment, especially water quality (ibid.) In 2010, the Pollution Control Department (PCD) of Thailand conducted beach quality ratings based on four major indicators, including environmental protection, pollution management, natural resources preservation and tourism management (Wipatayotin, 2010). The report (ibid.) identified the following and specific issues:

- Poor quality of beaches and the toll exacted on them by destructive activities.
- Waste water discharges are the main threat to beaches.
- Untreated waste water has been released into the sea.
- Patong and Rawai beaches were found to have an excessive amount of coliform bacteria (associated with human/animal feces) in the sea water.
- Nai Harn Beach is flooded with garbage with an average of 2.23 kilograms of garbage for each 100 square meters.
- Mai Khao Beach, a famous sea turtle hatching ground, the garbage problem is little better, with 1.7 kilograms per 100 square meter (ibid.).

Although appropriate, an in-depth analysis of water quality (scientific testing) was beyond the reach of the current research; rather this study is exploratory and seeks to identify if in fact water quality in Phuket and Phang Nga is relevant to the discussion of recreational surfing in Thailand.

Blauer (2009 personal communication) identifies that most surfing areas in Phang Nga are located near areas where canals meet the sea, as these areas create the desired ‘set-ups’ [bathymetric conditions] conducive to creating surfing areas. However, during high tides or heavy rains these canals discharge unpleasant smelling and discolored water directly into the surfing areas and surfers have been reported to have had health problems (ibid.) Remmers (2009 personal communication) reports that the klongs (natural water inlets and waterways) in the Phuket area discharge a “black-gooey” pollution into the sea which harmfully affects surfing areas. Sithidej (2009 personal communication), a

surf school owner in Patong, Phuket, notes that “Water pollution is generated by construction sites around Phuket... also, when it rains, there is effluent entering the water on the north end of Patong... the klong [canal] at the south end of Patong receives pollution from hotels and that pollution makes its way into the ocean.” Thompson (2009 personal communication) remembers surfing over the reefs at Kalim Beach located at the northern end of Patong Bay, “When I used to sit out there at Kalim, I could see the coral under the water. I used to use the corals as a line up [marker] to identify where to wait for the waves; but not today, the water is not as clear and reefs are not as healthy.”

Several informants reported to the researcher that after stormy periods they do not surf due to the brown smelly water and the amount of rubbish in the sea, rather they wait a day or two until the water quality improves. For example, Pawinnaporn (2009 personal communication) explains that she has gotten sick from surfing at Kata Beach on several occasions: “One day last year the waves were really good, and although the water was dirty, I went surfing anyways. I got very sick from the polluted water and had to see a doctor. As this wasn’t the first time I got sick from surfing in dirty water in Phuket, I am more careful now about when and where I surf.”

Coastal tin mining and water pollution

Tin mining was been carried out extensively both on land and in coastal waters in Thailand, and the paradox among the tin and tourism industries is relevant to the topic of water quality. Tin mining in the Phuket and Phang Nga provinces is believed to have some relationship to the current water quality situation during the surf season. Reynolds (2008 personal communication) notes that twenty years ago, when off-shore tin mining was still practiced in Phuket, water quality experienced while surfing was much worse than today. As tourism replaced mining, water quality improved over time (ibid.). Blauer (2009 personal communication) who conducted interviews with coastal residents and fisher folk reports that small tin mining vessels once lined the shore in the Khao Lak and Laem Pakarang area and the mining and tailings significantly affecting the reefs and water quality; and suggests that there may be a lasting legacy from the tin mining period in terms of environmental degradation.

As aforementioned, a study of coastal tin mining and marine pollution in Thailand, Changsan (1988) identifies that offshore dredging along the Andaman Coast resulted in marine pollution in two ways: one is the direct physical destruction of the

environment (coastal and reefs areas); the other is through pollution attributed to suspended mine tailings, which increase the murkiness [turbidity] of coastal waters and the smothering of organisms in near shore areas. Changsan (ibid.) identifies that the degree of mining activity is the main factor determining the impact of tin wastes on the open-water ecosystem and coral reefs, and notes that there is some relief during the monsoon season when some reefs partially recover following the natural removal of sediment by the surf and ocean currents.

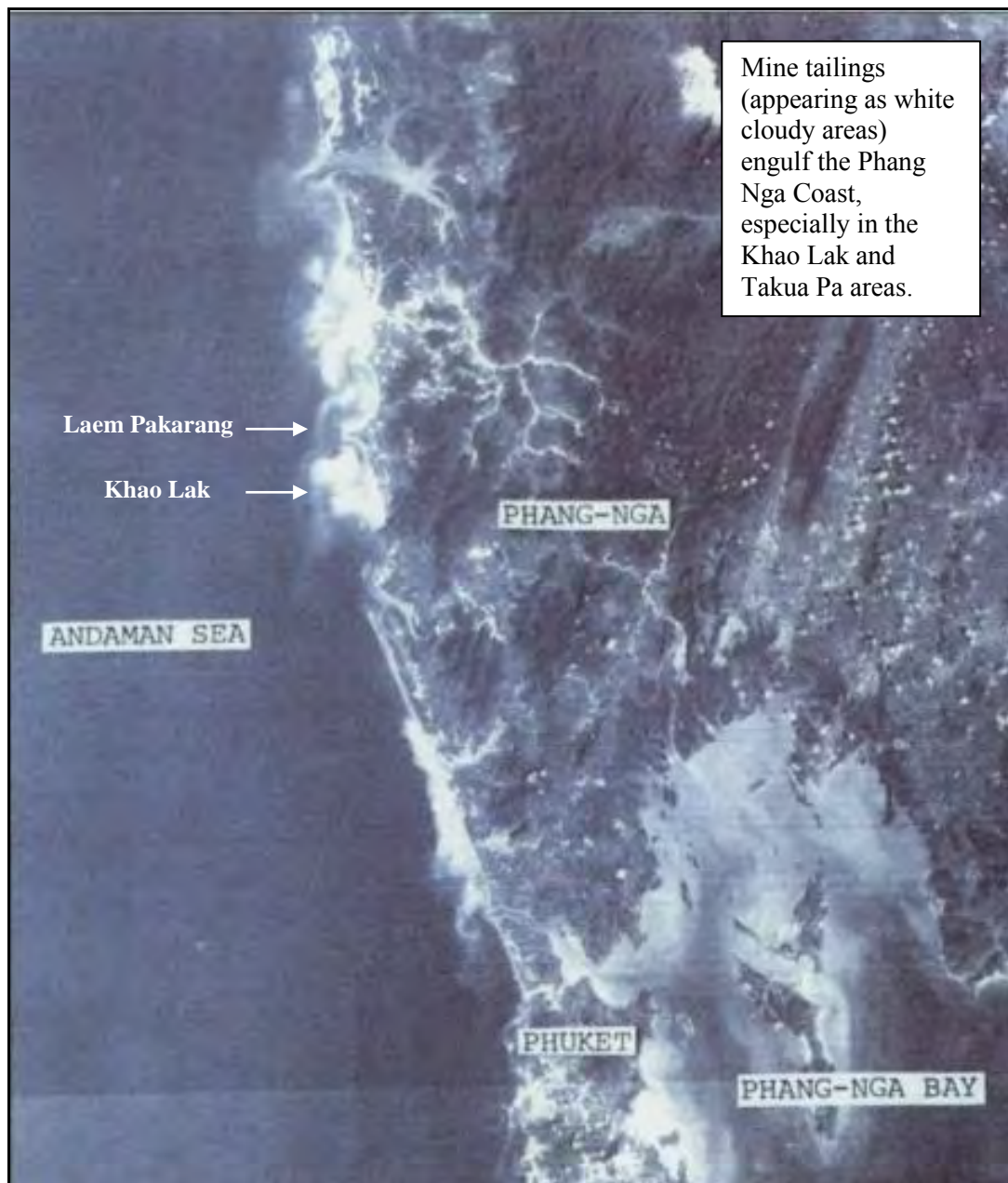
The mines incurred environmental degradation on land and sea. Surf beaches such as Kamala and Bang Tao were determined to be highly polluted due to past mining activities (SEPF, 1988). Whereas “vigorous efforts” were suggested to “restore the environment” at Kamala Beach, nearby Bang Tao Beach was considered “highly polluted” with damage likely to be beyond repair (ibid.). It was estimated that sixty percent of the coral reefs in the Bang Tao area were damaged as a result of off shore sediments from tin mining (Ruyabhorn & Phantumvanit, 1988). Indeed the surviving reef became known as “Tin Smelter Reef” (Wolkersdorfer, 2005), and Bang Tao used to be called ‘Lai Pang’ meaning ‘destroyed beach’ (Airyarak, 2008 personal communication).

Sediment plumes in 1977 shown as white cloud-like areas (Figure 3.11) and bucket dredging on the Andaman Coast (See Appendix G) may indicate the magnitude of the water pollution in the form of mine tailings consequential to the tin mining industry (Chansang, 1988). Furthermore, beyond the direct environmental degradation of tin mining, including that affecting living organisms, the practice also decreases the aesthetic value of the marine environment (ibid.). Richie (2010 personal communication) explains that, “Just one kilogram of tin ore produced an enormous volume of mine tailings.”

Establishing the extent that coastal tin mining during the previous century had on the current water quality index at surfing areas is difficult to say given the fact that no one really surfed from 1910 to 1980 in Phuket when reefs were spoiled in search of tin deposits on the ocean floor and sediment plumes from land-based mines were destructive to the living reefs. However, interviews conducted with Thai fishermen and their families in Phang Nga by Blauer (2010 personal communication) indicate that smaller driver-guided suction boats (see Appendix G) were highly destructive to coastal areas such as Cape Pakarang (Laem Pakarang) and contributed to the water pollution issue of that time and left a legacy of mine tailings which contribute to the current state of turbid waters evident during the surf season today.

Although this investigation offers mainly anecdotal evidence for the affects that tin mining has had on coastal surfing resources, it serves to identify that water quality and coral reefs in the Phuket and Phang Nga provinces were indeed altered through the course of history and residual effects are plausible.

Figure 3.11 Sediment Plumes on the Andaman Coast



Source: Changsang (1988) [Landsat photo, January 1979, NASA]

Future tin mining

The Andaman Times (2009) reported that tin mining may resume as long-standing Phuket tin industry company Tongkah Harbour controls what may be one of the largest deposits in the world (approximately 8,000 hectares containing 163 million cubic meters of tin oxide ore). Andaman Times (ibid.) reported that in lead of a submitted mining lease application, the company will begin “massive tin mining” off the coast of Khao Lak in the Andaman Sea, about 25 km offshore northwest of Phuket Island. Recent technological breakthroughs in off-shore mining, makes it technically and commercially feasible to do mining in the offshore fields which are located at depths of 70 meters (ibid.). At the time of writing, the researcher was unable to locate other sources of information regarding the future of tin mining.

3.3.2 Marine Debris

Marine debris is a practical term for trash or rubbish introduced to the ocean environment. Interviews with surfers and community members, Thais and foreign residents, and domestic and international tourists, from May 2007 to June 2010 indicated that marine debris in the surf line was widespread. Semi-structured interviews with surfers indicate that trash and debris along Thailand’s western coastline adversely affects the image and quality of the overall surfing experience. At the researcher’s request, foreign resident surfers assisted the researcher in identifying plastic materials floating at or just below the water surface, or washed up along the coast. Marine debris were examined to best determine the origin.

Interviews with surf tourists and foreign resident surfers from 2007–2010 indicated that 81% identified that marine debris on Phuket beaches was of some concern. For example, the following comments attest to this issue:

- Larry from Hawaii replied, “It’s too bad about the trash, I noticed it immediately, and it hit me in the face as soon as I got off the plane and walked on the beach at Nai Yang.”
- Kimo from Hawaii replied, “There is just too much debris in the water in Phuket.”
- Tom from California replied, “There is so much trash it gets wrapped around your legs and your surfing leash when we are trying to surf.”

- Mark from California replied, “There is really lots of trash after a major storm.”
- Michael–Anthony from Australia replied, “The beach in Phuket has a lot of rubbish washed up at times.”
- Daniel from Ecuador replied, “There is sure a lot of debris in the water and in the surfing area.”
- Craig from Australia replied, “Phuket has a problem with ‘storm trash’ – I had no idea about this problem before coming here.”
- Chris from the United States replied, “Tourists come to Thailand to experience the environment, the presence of marine debris and plastics in the sea is aesthetically and environmentally critical.”

In January 1988, the SEPF (1988) asserted that littering on the beach through carelessness is primary cause of beach pollution. However, although interviews with informants regarding how, why, or where, the rubbish originates offer only provisional results, a number of hypothesis emerged from interviewees including the following:

- During periods of high tides and heavy rains debris are flushed from local canals and are carried out to sea, returning with the waves and tides to the Andaman’s west-facing coastlines.
- Materials are dumped in the sea by Burmese work camp residents; materials are dumped into the sea from construction workers.
- Materials are carried out to sea and dumped by local fisherman.
- Materials are carried up from the Straits of Malacca by the dominate ocean currents and wind patterns.
- Large Indian Ocean storms transport the rubbish to the Thai coast.
- Boats passing in the outer shipping lanes are dumping these materials.
- Local beach businesses are somewhat responsible.
- Picnickers and beachgoers, including tourists, are somewhat responsible.
- Cruise ships pay local Thai companies to dispose of their rubbish when they come to Phuket, however these companies may be dumping the refuse at sea rather than on land as required.

Interviewees provided the researcher with a wide range of responses to the question: “Where is the trash in Phuket waters coming from?” The following shortlist of replies may indicate a number of conjectures:

- “It comes from Thailand, Indonesia, and Burma.”
- “It all comes from India.”
- “It all comes from Myanmar.”
- “It comes from tourists.”
- “It comes from the Straits of Malacca, carried by southerly winds.”
- “Ships are dumping the trash.”
- “Fishermen take it out to sea and dump it.”
- “The trash comes from the klongs (canals).”
- “Half of the trash comes from locals.”
- “I think the trash in the water and on beaches comes from rivers and boats.”
- “While off shore on a small boat I saw a large ship (I believe it was Indonesian) throwing enormous amounts of trash/garbage overboard.”
- “The rubbish originates from individuals who throw it into streams and canals and it eventually washes down to the sea.”

Further accounts for the origins and nature of rubbish on Thai beaches from members of the Phuket community reported the following comments to the researcher as follows.

Remmers (2008 personal communication) theorizes that materials coming from far offshore appear degenerated and algae-covered due to the extended time at sea, whereas materials originating from local canals and fishermen appear newer and were quite recently introduced to the environment: “During the early part of the monsoon season the trash is mainly from local sources, but as the large storm systems come up from the south later in the season, they bring the foreign garbage which may have barnacles stuck to it.” Remmers (*ibid.*) spent several days in September 2008, with the support of five Thai youth, collecting trash washed in at high tide in the Bang Tao Beach area; they collected approximately three-hundred cubic gallons of rubbish and reported that ninety-eight percent of the material was of Thai origin and appeared identical to materials used at local

construction sites. Remmers (ibid.) also witnessed Burmese work camp residents (in the Bang Tao area) dumping rubbish in tidal areas.

Mueller (2009 personal communication), the General Manager of Marriott's Courtyard Hotel in Kamala in 2009, believes that "The rubbish originates from three sources: local businesses, picnickers [park users], and the trash that washes in from the sea." He added, "Once I was showing a potential client the beach, it was so dirty [with rubbish] that it was embarrassing. We need a system in place to manage the issue, such as adequate trash bins and timely removal. Often the trash is left in bags near a full trash can overnight and dogs may tear it up and spread the trash around again."

Williams (2008 personal communication), with the Mai Kao Turtle Foundation, who has initiated beach clean-ups since 2004, has witnessed how the primary source of the marine debris is the "Careless rubbish disposal by people on boats and on the beach."

Blauer (2009 personal communication) has observed that in the case of Phang Nga Province, most of the trash with Thai labeling originates from local villages located inland and is eventually washed down to the ocean and the beach after heavy rains; rather than people intentionally throwing trash directly on the beach.

Hiro Tachiban, managing director for Tokonatsuya Co. Ltd., which organizes surf travel for Japanese clients to Phuket said, "Over the years, many customers are surprised at the amount of marine debris, especially plastic bags that are in the surfline and washed up on the beaches" (2010 personal communication).

Professional surfer Tipi Jubrik (2009 personal communication) said, "30 years ago in Bali there was no trash issue; before the 80s, everything was wrapped by natural leaf [in Bali], so they [local people] don't know how to deal with the plastic. I'm concerned to keep surfing areas clean for the next generation, to have the same condition as past years... I recognize a similar problem in Phuket as Bali."

Kamala Beach clean-up, May 10, 2009

To provide an example of the type and quantity of marine debris at a typical community-based beach clean-up, the Kamala Beach clean-up, May 10, 2009, included approximately sixty-five people who collected and estimated 150 to 170 thirty-gallon bags of trash (Figure 3.12). Notably, this is only one of any number of recent beach cleaning activities occurring in contemporary Phuket, thus the volume of marine debris removed from local beaches is significantly greater.

Interviews with community participants during the Kamala Beach clean-up offer a consensus that most of the trash is from local sources and a lot of it comes from commercial, recreational or subsistence fishers. Karl Graham (2009 personal communication), with the ‘Summer in Phuket’ media campaign said, “A lot of stuff comes from the fishermen and most of the trash is local; the ocean is full of garbage.”

Figure 3.12 Andaman Marine Debris, Kamala Beach Clean-up



Source: Author (May 10, 2009)

The following results are from the Kamala Beach clean-up held on May 10, 2009 and attest to the most commonly identified marine debris found on Phuket beaches:

- | | |
|--|--|
| ■ Plastic bags | ■ Metal bottle tops |
| ■ Plastic lighters | ■ Rubber slippers |
| ■ Plastic straws | ■ Plastic wire |
| ■ Plastic water bottles | ■ Fishing lines, nets, and baskets |
| ■ Plastic bottle tops | ■ “Ya Dom” (a type of snuff) |
| ■ Cans | ■ 2 syringes |
| ■ Plastic toys (constituting roughly 10% of the total) | ■ Cordage (thin ropes and strapping materials) |

Analysis of plastic bag labels

This investigation involves a study on marine debris conducted on the Andaman Coast from May 2007 to January 2010, in which the researcher collected 1,127 plastic bags at random on the Phuket and Phang Nga coastline (see Appendix H: Andaman Marine Debris: Plastic Bags in the Surf). Plastic materials were gathered either in the surf line or picked up on the beach at the high-tide mark. As shown in Table 3.11, analysis indicated the following results:

Table 3.11 Analysis of 1,127 Plastic Bags

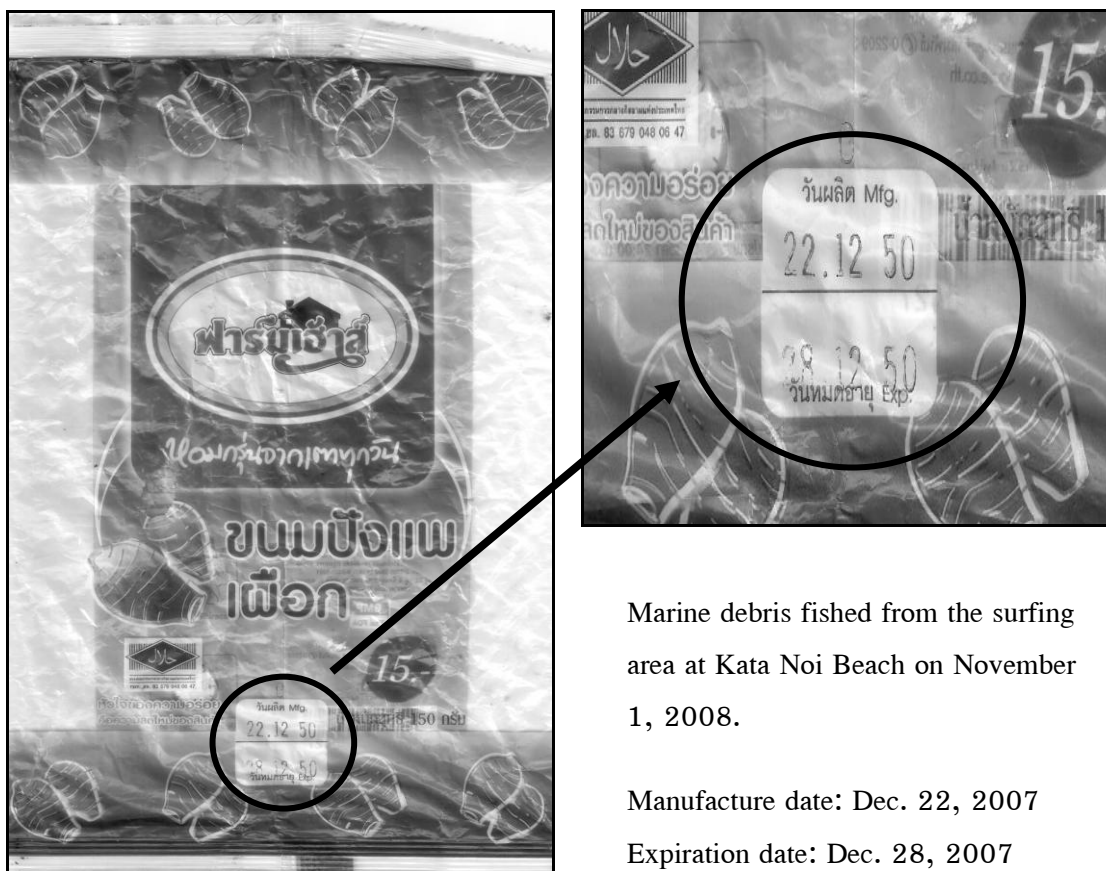
Percentage	Language	Potential country of origin
74%	Thai	Thailand
6.5%	Bahasa/others	Indonesia
3.5%	Malay/others	Malaysia
2%	Burmese/others	Myanmar
1.5%	Hindi	India
12.5%	indefinite	indefinite

Source: Author

In overview, many of the plastic bags identified in this study were mainly small packets of ‘ready to eat’ or ‘instant cooking products’, such as instant noodle or coffee packages. Also, approximately nine percent of the plastic bags with Thai labeling were from dishwashing soap, laundry detergent, or fabric softener. Appendix H includes examples of plastic bags fished from Andaman waters with labeling in various languages. Identified in the study, were plastic bags with Thai, Bahasa Indonesian, Malay, Burmese, and Hindi labeling.

In some cases, plastic bags with expiration dates were cross-referenced with the dates in which they were fished from the sea or washed upon the beach during a high tide to identify the lag period between the sale date of the item, its entry into the sea, and the duration of time it was at sea. However, these results were inconclusive as further research is necessary to provide decisive results. Nonetheless, Figure 3.13 identifies a product with a perishable date of previous to nearly one year prior to its appearance in the surf at Kata Noi Beach, Phuket.

Figure 3.13 Marine Debris with Identifiable Manufacture Dates



Marine debris fished from the surfing area at Kata Noi Beach on November 1, 2008.

Manufacture date: Dec. 22, 2007

Expiration date: Dec. 28, 2007

Source: Author

Blauer (2008 personal communication), located in the Khao Lak area, identified the writing on trash during August and September 2008 and reported to the researcher that writing was again predominantly Thai. Other informants had similar findings in regard to the rubbish being of Thai origin. An exception to the researcher's independent findings include, for example, a beach cleanup alert posted by the Phuket Boardriders website in late August 2008 when the trash collected was predominantly from Indonesia (Remmers, 2008 personal communication).

Marine debris, especially plastic, were found to be eminent and pervasive on Thailand's Andaman Coast, as identified in the surf tourist survey at Kata Beach (Martin & Assenov, 2008) and witnessed by surfers, surf tourists, the media, and the public at large. This topic is reexamined in the discussion section of Chapter 4.

3.4 Ocean Safety Assessments

From the perspective of recreational surfing in Phuket, and given the current trend to promote surfing as a tourism activity by web-based tourism promoters, the Tourism Authority of Thailand, local surf clubs, and corporate surf clothing companies (such as Quiksilver), the researcher has identified ocean safety as a relevant and significant topic to research and include in this research.

In recent years, Phuket has been plagued with tourist drowning and this subject has become a regular topic in the media. However, academic research into the high drowning rate in Phuket has not previously been conducted. Preliminary research indicates that there are mounting arguments surrounding various ocean safety issues in Phuket, especially tourist who drown in the surf. Williams (2006) notes that drowning is the leading cause of death for tourists visiting Phuket. Sidasathian and Tongdee (2010) produced a news report indicating that there were 50 surf-related drownings on the west coast of Phuket in 2009; and there had been 25 drownings between January and July in 2010. The article asserts the 2010 monsoon season is following the pattern of previous monsoon seasons whereby tourists from around the world needlessly drown in Phuket.

The researcher reviewed news articles published in the Phuket Gazette from 2007 through 2009 regarding ocean safety and identified two reoccurring topics: drowning and the provision of lifeguards. The following short research is primarily concerned with surf-related drowning (drowning as a result of wave activity) and does not include the issues surrounding provision of lifeguards, which are related to funding and political issues. Furthermore, this study does not provide definitive statistics on drowning rates.

As Phuket surfers were often involved in rescue attempts, the researcher incorporated information gained from personal interviews with Thai, foreign resident and surf tourists at various beaches (see section 3.4.2 Interviews with Surfer-Lifesavers).

This study serves to present ocean safety assessments and identify related issues for five beaches which are notorious for tourist drowning during the surf season and to highlight the role that surfers play in water safety in Phuket. The former is to identify the physical features and processes at beaches which are attributable to the loss of human life; the latter is to identify the role of resident surfers as well as surf tourists in rescue-assisting swimmers.

Phuket ocean safety in the media

This study finds that much of the surfing literature on Thailand is marketing related and information on ocean safety is scant, especially that which is available to tourists. Information on drowning in Phuket, albeit non-academic, is coming from the media in response to drownings and related issues. With the search for the 'surfing Thailand' information came related topics, namely surf-related drowning in Phuket. Articles appearing *Phuket Gazette*, *The Nation*, *Bangkok Post*, foreign newspapers, such as *The Daily Mail* in the United Kingdom, as well as on various websites (such as *Phuketwan.com*), blogs, and forums have offered discussion on surf-related drowning in Phuket. The media served as impetus toward developing this research and discussion on surfing and ocean safety in Phuket. Through participant observation, the researcher identified surf-related drowning as a common topic among the resident Thai and foreign surfers, who tell and compare their Phuket surf-rescue stories.

At the time of writing, there were several reports of law suits in the media stemming from the families of tourists who drowned on vacation and brought charges against the travel companies involved. They have been accused of, for example, booking a family with small children at Karon Beach during the monsoon season and told it is safe for family swimming and subsequently family members drowned (Condrón, 2009). Controversy has surrounded the *Lonely Planet* travel guide which published the statement mentioning that Karon Beach was the fourth most child friendly beach in the world (ibid.). Morison (2009) identifies that "Travel writers, resort managements and local authorities have for years ignored the reality that Phuket has failed to face up to issues of tourist safety."

Drowning at Phuket beaches

The research problem includes that in recent years, Phuket has been plagued with a series of surf-related drowning, mostly tourists, and it is assumed that these drowning are avoidable. The researcher found that in Thailand, drowning rates are not segmented by cause and therefore beach drowning is not distinguished with other forms of drowning, such as those that occur in a swimming pool or result from boating or fishing mishaps. Therefore it is very difficult to get empirical data on ocean drowning and specifically those which are surf-related.

There are two relevant issues to consider regarding the high drowning rate in Phuket, one is the natural conditions of winds and waves, and the other is the issue of lifeguard services. First, we can consider that Phuket wave activity is mainly from short-period swell associated with on-shore wind with waves arriving in close together, which can cause very strong rip currents and make swimming or surfing awkward even if the waves may not appear particularly large or dangerous (see section 3.4.1). Secondly, lifeguarding services have been precarious for the previous years, alongside various allegations and funding issues. Simply put, sometimes there are lifeguards and sometimes there is not. This study approach is framed as a safety assessment and will not address the funding issues or policies related to local lifeguard operations; rather it provides a shortlist of recommendations in Chapter 4.

3.4.1 Waves, Winds, and Ocean Safety in Phuket

Wilks (2005) identifies that drowning is the second most frequent cause of injury death among international travelers to Queensland Australia and tourists are a target group requiring special attention due to their unfamiliarity with ocean beaches and surfing activities, and in some cases having the additional challenge of poor swimming skills, language barriers, and disorientation in a foreign vacation environment.

Correspondingly, given that Phuket is a prolific tourism destination attracting individuals from around the world who may or may not have experience with ocean waves, the following safety assessment is germane. Kuernun (2009 personal communication) poses that in the case of Phuket, tourists may be drinking alcohol, and a considerable number of swimmers rescued by lifeguards each year had been drinking.

Localized factors

From a perspective of ocean safety, the researcher's field study identifies that weather conditions on the Andaman Coast produces identifiable hazards associated ocean conditions in four aspects. First, as waves arrive close together, they can propagate a proportionately strong ocean current relational to the period of the swell. Secondly, as waves arrive consistently (close together), swimmers and surfers have very little time to recover between waves. Thirdly, ocean conditions are often associated with stormy or 'choppy' water surface conditions, which can inhibit visibility and disorientate individuals. Fourthly, groundswell (long-period swell) when mixed with short-period swell may cause

‘flash rips’ that occur with a rapid onset and may be short-lived (see the forthcoming section on ‘flash rip currents’).

Short-period swell

As identified in the coastal assessment section of this thesis, the predominantly southwest monsoonal windflow greatly influences the types of waves and conditions found in the Andaman region. Strong winds and associated thunderstorms push a stream of wind, waves and heavy weather into the Andaman Coast from the southwest. Therefore, given the close proximity of the ocean storms and associated winds which generate the waves near Thailand, the Andaman Coast regularly has a ‘short-period’ swell (waves are close together), which can cause very strong rip currents and strong on-shore winds (which can make swimming or surfing awkward). Short-period swell means that the waves are arriving in close together, whereas a long-period swell means a longer amount of time between the waves arriving at the shore. For example, a short period swell of seven seconds implies that a wave would crash on the shore (or on surfers and swimmers in the surf zone) every seven seconds.

In terms of ocean currents in Phuket, the short-period swell phenomena has the potential to generate strong near shore currents; it also limits swimmers and surfers with less time to recover after each wave breaks. Strong currents in Phuket are often a result of waves arriving in close together, pushing on top of each other, and pushing a large volume of water to the shore which returns to open sea as a rip tide. These rip tides can appear quickly in Phuket, especially as tides rise and larger volumes of water come closer to shore and reflect back toward the sea. During high tides, waves reflect off the beach and return to sea (called ‘backwash’) resulting in currents increasing in intensity and becoming especially strong.

Flash rip currents

Furthermore, the evidence of groundswell activity needs to be considered in the inshore wave action in relation to ocean safety. As aforementioned, comparative to short-period windswell, groundswell infers deeper-travelling waves (in relation to the seafloor) which are generally more powerful. On the Andaman Coast of Thailand, short period swell may mask the groundswell, effectively disguising the longer-period, more powerful wave action. Strauss (2010 personal communication) observed that at Kata

Beach, Thailand, groundswells may produce flash rips as one or more waves arrive “masked” by the disorganized short-period swell. As the groundswells arrive in a different wave period and with a larger volume and force, they cause a notably higher run-up on the beach.

These conditions (those that produce flash rip currents) pose considerable hazards in Phuket, especially when considering that the majority of swimmers are tourists. Tachiban (2010 personal communication) believes that it is precisely this phenomena that causes many of Phuket’s tourists to get into trouble. These findings, Strauss (2010 personal communication) and Tachiban (2010 personal communication), are in line with the researcher’s 2007–2010 field observations.

High and shoulder tourist seasons

Coastal conditions vary from one time of the year to another. For example, during the shoulder seasons (before and after the southwest monsoon season) beach conditions may vary from other times in the year. For example, prior to the southwest monsoon, in the month of April, more sand rests on the berm of the beach, which forms an embankment, causing waves to plunge on the beach (plunging breakers) and resulting in a backwash effect. In the early surf season, this time period corresponds to the Songkran holiday in Thailand when beaches experience a surge in domestic tourism. Informants have reported to the researcher that rescues rates of Thai swimmers in Phuket are at an annual high during this period.

As the monsoon season (and the surf season) progresses, the sand berms are cut away and carried out to sea by the wave activity to form off-shore sand banks. Generally, waves will break further off-shore once the sand banks are formed and lessen the risk posed by plunging breakers directly on the beach (See Appendix I ‘Types of Waves Germane to Ocean Safety’ for the three types of shorebreak occurring in Phuket).

During the tourist ‘high season’ in Phuket (December through February) Phuket receives only periodic wave activity as a result of Indian Ocean groundswells. As with the shoulder seasons, beaches may be steeper than during the monsoon season and given long-period swells associated with groundswells, tourist can be easily caught off guard inasmuch as the ocean may appears calm, yet suddenly waves may appear as plunging or surging breakers directly onto the beach (see Appendix I). The implications of this include the potential for neck and spinal injuries caused when a plunging breaker

unleashes its force onto the hard sand and can knock an individual off their feet causing them to hit or bounce off the hard sand in an awkward position.

Loss of coastal reefs

Of consideration for the wider issue of near-shore currents, anecdotal evidence suggests that near-shore wave activity would behave differently if reefs were removed or died off, although to what extent is beyond the scope of this research; rather the section on tin mining has offered some indication that off shore reefs were degraded or removed all together due to 70+ years of coastal tin mining. Other causes, such as dynamite fishing, have damaged coastal reefs (Reynolds, 2009 personal communication). Of relevance to this research, we can consider that near-shore reefs once protected the coastal areas to some degree from the surf, particularly Bang Tao Beach, Kamala Beach and Surin Beach.

Regardless of past events which have influenced coastal bathymetry and topography on the Andaman Coast, it is relevant to recognize that changes in the coastal seafloor indeed affect coastal wave activity. For example, reefs would have slowed waves, especially groundswells which are sensitive to the seafloor conditions; while, sedimentation and coastal changes due to tin mining would have some affect on wave activity. Therein, the loss of reefs and other changes in the coastal bathymetry and topography are likely to have had an effect on inshore currents and this has implications related to ocean safety.

3.4.2 Interviews with Surfer-Lifesavers

The following research was reported in The Phuket Gazette 17(15), April 10–16, and was published in Thailand Surfrider Vol. 3, 2010. See Bibliography for ‘Fein, S. (2010). Surf’s up, drownings down, as low season waves roll in’ and Appendix D to review the full article, and ‘Martin (2010b) The Surfer-Lifesavers of Phuket’.

Through participant observation, the researcher conducted 167 interviews from May 2007 to January 2010 with surfers in Phuket. Interviewees included 48 Thai and expatriate surfers, all of whom reside in Phuket (or Phang Nga) and surf regularly during the Andaman surfing season (April to November), and 119 surf tourists from a variety of countries including Australia, America, Singapore, Japan, South Africa, and others. Most of the respondents herein (especially the tourists interviews) were met for the first time in the water during surfing. For example, while waiting for waves, the researcher

regularly asked individuals about their experiences and opinions regarding ocean safety in Phuket. During an average surf session of an hour, the researcher may have an opportunity to discuss issues with several individuals. The researcher introduced himself and the nature of the study being undertaken as graduate research and most surfers were glad to share their experience and the extent of their knowledge about surfing in Thailand. When possible the researcher interviewed participant on land and request them to fill out a questionnaire (see Appendix E); when not possible to interview on land, the researcher returned to shore and documented the interview with detailed notes written from memory. This is to say that when interviews took place in the water, the researcher listened carefully and recorded notes immediately following the surf session into a daily journal. Limitations to the research include that the informants were met at random and interviews were conducted spontaneously. Interviews ranged in time and depth from short exchanges of dialogue to in-depth discussions.

Interviews with water safety experts regarding ocean safety in Phuket lend insight to the discussion:

- Director of Hawaii County Aquatics, Larry Davis, examined ocean safety conditions Phuket and reported to the researcher that “The water safety aspect needs to be realized in Phuket, it is much more dangerous than it appears, especially for the lay person. Ocean safety does not appear to be taken seriously in Phuket” (2008 personal communication).
- Professional surfer Tipi Jubrik from Bali expressed, “Strong currents in Phuket may exist for a number of reasons, such as the water pushing around the island relational to its position on the coast... I rescued two swimmers Kata Noi Beach when I came to Phuket the first time in 2008” (2009 personal communication).
- Thai waterman Khun Somkhit Kuernun said, “Before the tsunami, there were an average of 12–16 surf-related drowning per year, but for the last 5 years, with intermittent periods of having lifeguards on beaches, the average was 9–12 per year [prior to the 2009 surf season]. Most of the drowning during the surf season is surf-related, while drowning in the high season is usually alcohol related” (2009 personal communication).

- Thai surfer Satja Chayangkanon said, “The currents are bad in Phuket, and although I lived in Hawaii and have been surfing for 23 years, I almost drowned at Kata Beach... I lost my board and had to swim for a long time. Overall, Phuket has strong currents, even on a calm day at Kata when paddling a ‘stand-up paddleboard’ (SUP) around the point to Kata Noi you can feel the pull” (2010 personal communication).

Among surfers, several scenarios were identified regarding surf-related rescues (a rescue infers ‘assisting’ a swimmer in need of help). Foremost, Thai and foreign resident surfers rescue tourists and Thai swimmers; and to a lesser extent, surf tourists rescue non-surfing tourists and Thai swimmers. Among interviewees, there were no reports of surfers being rescued by swimmers, and no surfers were reported rescuing other surfers, save for the occasional surfer losing their surfboard and being assisted in by another surfer.

The vast majority of surfers who responded to the rescues were already in the water when they saw the person in trouble or heard them call for help or saw the victim having difficulty swimming in the surf line. For example, the researcher has responded to eight requests for help while surfing and all were tourists. Of the 48 Thai and foreign resident surfers interviewed (all of whom reside in Phuket or Phang Nga) and surf regularly during the Andaman surfing season (April to November), 23 reported that they had each made at least two rescue-assists per year over the previous three year period (2007–2009) and were able to describe the chain of events in some detail. This more or less coincides with the researcher’s personal experience of 8 rescues in the three years study period. Therefore, with 23 surfer’s rescuing an average of two people per year, the research identifies an average of 46 rescues per year, and given the three year study period, this amounts to 138 rescues by the group of surfers interviewed. The actual number is likely to be considerably higher since this statistic only reflects those interviewed by the researcher.

Additionally, the researcher recorded 53 assorted rescues of various sorts by Thai and foreign resident surfers in the same period (2007–2009). For example, there was a report of a group of four European tourists swept off the beach near Khao Lak (specifically at Khuk Khak Beach) who were rescued by foreign resident surfer Matt Blauer (2009 personal communication).

Totalling the aforementioned 138 rescues performed by surfers who surfed regularly (from 2007–2009), the 53 random rescues for the same period by other resident

surfers, and including the 8 rescues made by the researcher, this study documents 199 rescues performed from 2007–2009. Table 3.12 provides the details.

Table 3.12 Rescues Performed by Thai and Foreign Resident Surfers (2007–2009)

	surfers who performed rescues	total people rescued over the 3-year period
average of 2 rescues per year for 3 consecutive years	23	138
random rescues from 2007-2009	25	53
the researcher's rescues	1	8
total	49	199

Source: Author

Between 2007 and 2009, 119 surf tourists were asked about their experiences in water safety while in Phuket. 22 surf tourists described that they had rescued a tourist swimmer one time during their surfing experience in Phuket, while four surf tourists reported that they rescued at least two tourists during their surfing experience in Phuket and one described assisting a family of three tourists to the shore. This indicates that of the 119 surf tourists interviewed from 2007–2009, 27 (over 20 percent of those surveyed) had made rescues totaling 33 individuals. Table 3.13 provides the details.

Table 3.13 Rescues Performed by Surf Tourists (2007-2009)

surf tourists who performed rescues	amount of rescues performed	total rescues
22	1	22
4	2	8
1	3	3
27	1.22	33

Source: Author

This study was unable to identify the place of origin for individuals who were rescued due to the fact that many of the surfers who performed rescues did not consider at the time to ask individuals where they were from. However, upon being interviewed by the researcher, many surfers believed that their victims to be European. Regarding the eight rescue-assists performed by the researcher, all were male tourists of the following nationalities: four Germans, two Russians, one Swiss, and one Japanese.

3.4.3 Surf Beach Safety Assessments for 5 Beaches in Phuket

Davis (2008 personal communication) identifies that county lifeguarding agencies in the state of Hawaii, USA, perform periodic safety assessments at local surf beaches. This short research does not attempt to address the social aspects surrounding beach safety per se, rather it seeks to identify the water safety issues and underlying concerns of the physical environment at specific beaches, to classify the predominate ocean currents, and to generate ocean safety maps. At the time of writing, the researcher was unable to locate a single map or reference to the ocean currents corresponding to specific beaches. As aforementioned, Morison (2009) asserts that travel writers, resort managements and local authorities have for years ignored the reality that Phuket has failed to identify the issues of tourist safety. Information on surf beach safety generally suggests that tourists should not swim during the monsoon season. However, it is likely to assume that a primary motivation for tourists staying at beachfront hotels is indeed to visit and swim at the beach. A reaction to this (the inevitability that tourists will indeed visit the beach intent on swimming), by a number of stakeholders, has been reflected in the media. For example, a considerable number of articles appearing in *The Phuket Gazette* and *The Phuket Post*, and online at *Phuketwan.com*, which report on tourist drowning and present allegations aimed at resorts and governmental authorities, as well as recommending that tourists should not swim if they see red flags posted on the beach.

With the abovementioned issues in mind, and in order to provide a documented basis for future research with an aim toward improved ocean safety awareness, the researcher assessed five surf beaches in southern Phuket which are notorious for surf-related drowning: Surin Beach, Karon Beach, Kata (Yai) Beach, Kata Noi Beach, and Nai Harn Beach. The significance of the assessments is to identify the potential hazards, primarily the ocean currents, during the surf season. Pilot assessments were made by the researcher with cross-verification through personal interviews with Thai and foreign resident surfers. Figures 3.14 to 3.17 illustrate the result of the research. Major currents are identified with large arrows, while inshore ‘feeder rip’ currents (i.e. flash rips) are identified by the smaller arrows.

Although surf beach assessments for all of the Phuket beaches would be appropriate, the researcher was unable to conduct a study for each of the surfing beaches identified in Figure 3.9 (Surfing Areas and Bathymetry of Phuket). The following summaries are brief and refer to the respective maps which identify the predominate rip

currents occurring during periods of high surf. The five beaches described share a common denominator of having deep water close to shore. This is significant in that the power and speed of the waves may be stronger and faster as they arrive from deep water compared to waves which are slowed and decreased in energy by shallow waters offshore.

Surin Beach

In the SEPT (1988) report, Surin Beach was assessed as, “Not suitable for swimming” and was declared to have had a history of drowning. A characteristic of the ocean currents at Surin Beach is that they may change dramatically depending on tides and swell directions, making it difficult to identify hazards associated with surf activity. Wave activity tends to focus on the central and northern areas of the beach. According to Remmers (2009 personal communication), during periods of average to high surf, there are normally four distinct rip currents directly on Surin beach. During especially high surf the four currents illustrated on Figure 3.14 combine into two large rip currents (ibid.).

Thai elders who lived in the Surin Beach area during the maritime tin mining era recount that the coral reefs, which once spanned from the shoreline to the surrounding waters, have all but vanished due to the mining industry (Aiyarak, 2008 personal communication). It is plausible that coastal currents were considerably altered due to the loss of these reefs. Given the deeper seafloor bathymetry of Surin (in comparison with nearby beaches) it may be more susceptible to the aforementioned effects of groundswell which can produce ‘flash rips’.

Karon Beach

In recent years, Karon Beach has been the subject of considerable controversy regarding tourist drowning. The long sweeping beach is especially open to wave activity from the south, the west, and the north. Unique to Karon Beach, at the onset of the monsoon season, the sand bars shift into ‘sand channels’ which form perpendicular to the beach. These sand channels are areas of shallow water which act as obstacles, directing the water carried in by the surf to return to sea between them. The river-like effect is essentially a rip current which can be of considerable intensity depending on the wave height, frequency and tides. Given deep inshore bathymetry of Karon (comparative with other beaches in Phuket) is especially susceptible to rip currents fueled by groundswell activity. Groundswells are able to break closer to shore and have high run-up heights.

Furthermore, Karon as is approximately 3 kilometers long, it is akin to strong longshore and inshore currents. As wave energy returns to sea in large volumes, the currents may build up strength as the water moves parallel to the beach in the direction of the waves (i.e. southwest swell direction may produce northerly inshore currents).

Karon Beach lifeguard Dhartree Promnoon identifies that during the southwest monsoon, there are as many as 18 distinct rip currents and a pervasive inshore ocean current which flows from south to north along the beach (Promnoon, 2010 personal communication). Thompson (2010 personal communication) notes that inshore currents at Karon Beach may suddenly shift or change direction, posing additive dangers for tourists who are unfamiliar with surf beaches. Raab (2010 personal communication) who grew up surfing the big waves of Hawaii's 'North Shore' attests to the strong currents associate with the sand channels at Karon beach, "I got caught in a rip once while swimming at Karon. I used to still go back frequently to Hawaii, so the head-height waves at Karon looked small to me... yet I still got in a little trouble and had to swallow my pride and swim across the rip for a long time, about a quarter of a mile, and then swim in with the waves. Imagine if you weren't used to the ocean and the waves." Sand channels and associated currents may be difficult to recognize for individuals without significant ocean experience and local knowledge of the area. In Hawaii, county lifeguards place red flags to mark these channels and keep the swimmers out of the area (Davis, 2008 personal communication). Figure 3.15 identifies the typical sand channel effect occurring at Karon Beach.

Kata Yai Beach

Kata Yai Beach is Thailand's number one surfing beach. Although the berm of the beach is less steep than Surin and Karon, it is similar in bathymetry, although the southern area of the beach is not as steep or deep during the monsoon after the sand bars develop. Wave activity tends to focus around the southerly end of the beach and correspondingly, the ocean currents around the south end of the beach are normally the strongest. Currents at Kata Yai Beach are more predictable than those occurring at Surin and Karon as identified by Figure 3.16. During wave activity, an ocean current develops along the rocky shoreline which pulls directly out to sea. This current is often utilized by surfers as a method of getting out to the open ocean quickly, but for the average swimmer or ocean novice, this current may move faster than that of a strong swimmer, making the area especially problematic for tourists. Approximately 100 to 200 meters north of the southern end of the beach, flash rip currents regularly occur, especially during a mixture of short-period and long-

period swell activity combines with high tides. This is especially problematic given the volume of swimmers at times in correlation with the rapid onset of these fast-moving currents.

Kata Noi Beach

Kata Noi Beach is unique in Phuket in that it receives even the smallest wave activity, including southwest groundswells during the shoulder and high seasons. This is to say that at a time when other beaches in Phuket may have little or no wave activity or rip currents, Kata Noi Beach may indeed have surf and associated rip tides. Rip tides at Kata Noi Beach are defined by a perpetual strong current at the north end of the beach which follows the rocky shoreline directly out to sea. This area should be avoided by swimmers. Even during periods of the slightest wave activity, the current can easily move faster than even an experienced swimmer. Local Thai surfer Tongooni (2008 personal communication), who has surfed the areas for the previous decade indicates that tourist repeatedly have difficulties in this area. Similarly, the researcher has responded on four occasions to swimmers in distress at the northern end of Kata Noi Beach. Figure 3.16 identifies predominate ocean currents occurring at Kata Noi Beach.

Nai Harn Beach

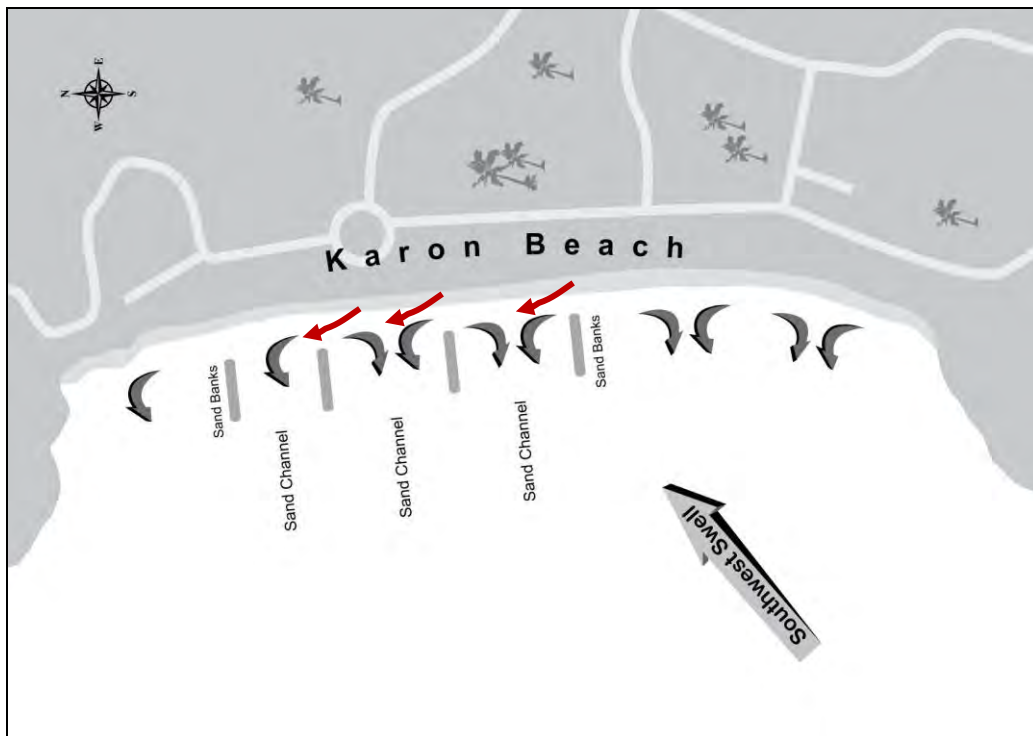
Nai Harn Beach is somewhat similar to Surin and Karon beaches in as much as the shallow sand bars give way to deep water. However, the large bay fronting the beach is much deeper. Therefore, a characteristic of wave activity at Nai Harn Beach are ‘punchy’ waves, called plunging breakers (see Appendix I) and associated strong currents. The predominate rip currents occur at the southeastern end of the beach near the rocky headlands where the best surfing waves are propagated. Rip currents occur along the rocky headland may take swimmers directly off shore and into the surfing area. A second rip current results from the backwash resulting from sand banks associated with the estuary at the southeastern end of the beach and pulls parallel to the beach and then bends toward the open sea. This area is notorious for tourist drowning and is the most common areas where surfers rescue-assist swimmers in distress (interviews and the researcher’s personal experience). Furthermore, a large rip current normally forms near the center of the beach and extends well offshore into particularly deep water. Figure 3.17 identifies predominate ocean currents related to wave activity at Nai Harn Beach.

Figure 3.14 Surin Beach Rip Currents



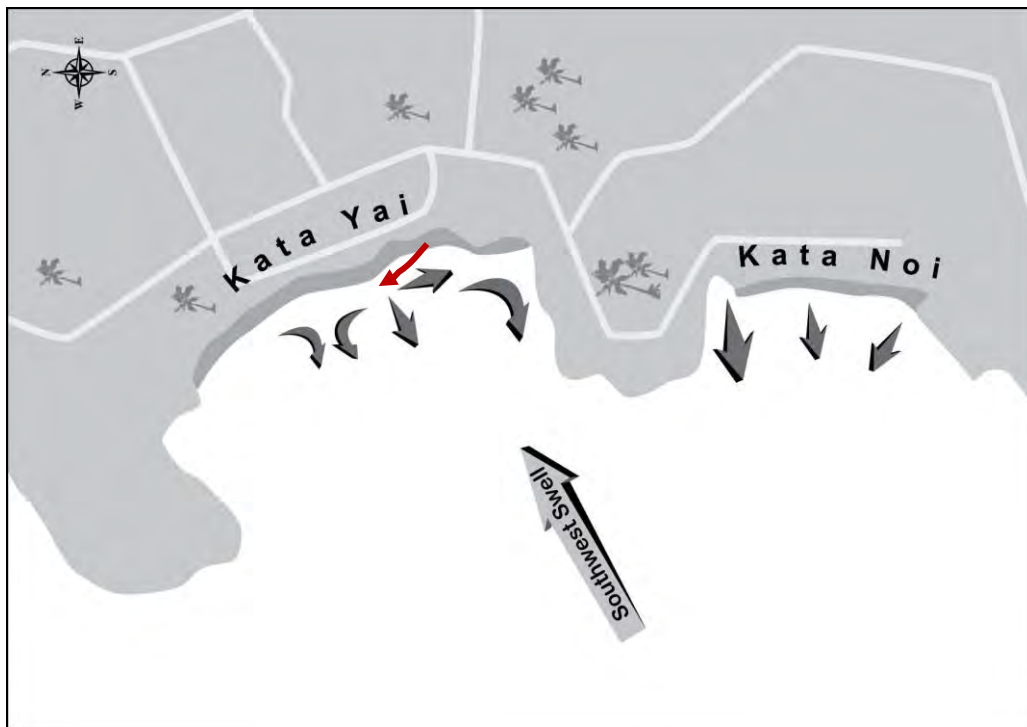
Source: Author

Figure 3.15 Karon Beach Sand Channels and Rip Currents



Source: Author

Figure 3.16 Kata Yai Beach and Kata Noi Beach Rip Currents



Source: Author

Figure 3.17 Nai Harn Beach Rip Currents



Source: Author

CHAPTER 4

SUMMARY

This chapter concludes the research, providing the discussion which follows the research objectives, and clarifies the foreseeable benefits of the research to the stakeholders of Thailand's coastal environment; it presents the facts on coastal surfing resources in Thailand and constructs a framework for informed decision-making. Comparatively and thematically, this chapter considers the insights gained from literature review juxtaposed to the results of the investigation. Whereas the results of the research identified and qualified the significance of the diverse studies found herein, the following discussion and conclusion explore the implications of the related findings.

Surf tourism and coastal resource

Tourism holds an important place in the Thai economy and surf tourism is a new market segment in Phuket. The research has identified a number of relevant areas for discussion related to surf tourism in Thailand, including: limited coastal resources; coastal topography and bathymetry; types, quality, and occurrence of waves available; different swell windows for each province; access to insular areas; water quality; water safety; and other limitations related to the resource. In summary, the monsoon season dominates the discussion of surf tourism in Thailand in regards to the physical environment, while the 2004 Indian Ocean tsunami brings institutional attention and awareness, expanding the discussion on coastal resource management and generating areas of research. It is in this context that the discussion of surf tourism and coastal resource is framed.

Dialectical implications of research

In terms of the research approach, as aforementioned, dialectic is acknowledged, whereby the prospect of significant natural and manmade resources for surf tourism is clear; yet an anti-thesis emerges in view of significant conditional factors, such as the abovementioned occurrence of 'surfable' waves, the remoteness and seasonality of select surfing areas, environmental concerns including water quality, and human issues of drowning and ocean safety. While the thesis bears positive similes, the anti-thesis bears negative similes. Therein, the synthesis steers the discussion toward understanding of

coastal surfing resources, the sustainability and conservation of surfing areas, and the continued research of the physical and social environment of the Andaman Coast.

4.1 Discussion

The researcher's exploratory field study discerns that Thailand holds clear potential for surf tourism. While Thailand has the 'tourism', this study explored the implications of 'surf tourism.' This research is prospect to documenting the surfing areas of coastal Thailand; and it finds that indeed areas for surfing exist. Informative implications herein pertain to the coastal resource assessment for surf tourism in Thailand and are placed unambiguously in the Thai context. Nine topics are presented for discussion; each is developed to illuminate the study inclusive of the material put forth in the introduction, the review of the literature, and approach of the research; each explores the implications of the results found herein:

- Surfing and the Tsunami in Thailand
- Demand and Awareness of Surf Tourism in Thailand
- Thai Coastal Resource and Surf Tourism
- Thai Water Quality and Surf Tourism
- Thai Water Safety and Surf Tourism
- The Value of Thai Surfing Resources
- Sustainability and Conservation of Thai Surfing Resources
- Thai and Mentawai Surf Tourism in Comparative Context
- Interdisciplinary Context of the Study

4.1.1 Surfing and the Tsunami in Thailand

Overall, there are more surfers utilizing coastal surfing resources than before the tsunami. The implications of the tsunami on the prospect of surf tourism are three-fold: the physical impact, the institutional impact, and the psychological impact. Tragically and paradoxically, it was the tsunami that brought a new dimension of awareness and conservation to Thailand's Andaman Coast.

The physical impact

The tsunami had an extraordinary impact to the Andaman Coast and the level of devastation varied significantly in each province depending upon a number of

natural parameters, including bathymetry, slope, elevation and presence of natural barriers; and man-made factors, including coastal land-use and development.

Based on personal interviews, the physical impact of the tsunami on surfing areas was found to be minimal. However, as a study on the natural processes related to the bio-physical characteristics or sustainability of surfing areas had not been carried out previous to the tsunami, it is problematic to measure the changes, if any, to surfing areas.

Interviews with surfers indicated that beaches and surfing areas were changed to some degree, however most areas have apparently returned to normal after the first year, although some areas remained 'rockier' for several years. The character of some beaches, such as a 'narrowing effect', has not seemed to have affected the surf sites. Reefs were damaged in some surfing areas, such as Nai Yang and Laem Pakarang, and overall, reefs near surfing areas are reported to be less healthy now. Nonetheless, at the time of writing, the quality of waves at most reef breaks is believed to be about the same. Of special consideration, the Laem Pakarang area was visibly altered and has been in a state of change ever since the tsunami, with sand and coral deposits building up day by day, month by month, especially around the northwestern area of the cape.

Institutional impact

The 2004 Indian Ocean tsunami was an unprecedented event which affected Andaman coastal resources as never before anticipated; it also brought the establishment of a new and progressive era for coastal resource management and the coordination among stakeholders for the Andaman Coast. The breadth of responsiveness encompasses communities alongside Thai and international governmental and non-governmental organizations. As aforementioned, the United Nations Environment Programme (UNEP, 2005), suggests that "if anything positive can be gained from the disaster, it is clearly the opportunity it offers for Integrated Coastal Zone Management (ICZM)."

Institutional impacts include the growth in coastal research which benefits the overall conservation of coastal resources. This thesis reviewed coastal resource management organizations and found a considerable number of international and Thai organizations were operating on the Andaman Coast (see Tables 1.6 and 1.7), especially those from European countries. The study found that there was a post-tsunami trend to inventory, assess, and map coastal resources, especially coral reefs, seagrass beds,

mangrove forests, and marine life habitats. Secondly, this research found that there is a trend in the integration and sharing of knowledge among stakeholders (Dunbar, 2009 personal communication; Vattanasoontorn, 2009 personal communication). Thirdly, this research found that surfing was not a part of the post-tsunami coastal assessment and conservation schema.

The 2004 Indian Ocean tsunami is behind a course of research and new literature focused on Andaman coastal resources. Therein, the institutional impact on recreational surfing and surf tourism includes, by default, a heightened awareness on coastal conservation. The discussion on topics such as coral reefs, beaches and water quality is relevant to the understanding the changes occurring to other coastal resources, including surfing areas. Thus, the post-tsunami trend toward ICZM opens a pathway for research and conservation coast surfing resources.

The psychological Impact

Lasting psychological impact has been found to adversely affect the lives and minds of the people with direct personal experience from the tsunami (Griensven et al., 2006; Thienkrua et al., 2006; Sokhannaro, 2006). However, fisher folk, those who live and work on the sea whole-heartedly went back to the sea (Sokhannaro, 2006). Similarly, although surfers died in the tsunami, they have returned to the sport and surfing among Thais and foreign residents in Phuket has dramatically increased since the tsunami. Consequently, the psychological impact of the tsunami on recreational surfing and surf tourism is negligible and indeed there are more surfers now, including surf tourists and surfing tourists than previous to the tsunami (Nadan, 2007 personal communication; Ayarak, 2008 personal communication). The post-tsunami growth in surfing is reflected in the literature, the online media, and in the sponsorship and participation in surfing contests in Phuket. However, given that a great number of coastal inhabitants with direct personal experience in the tsunami may be afraid to go in the water, to eat fish, or live in fear that another tsunami might happen at any time without warning (Sokhannaro, 2006), it is unlikely that surfing will be popular among coastal communities in these tsunami affected areas in the near future.

4.1.2 Awareness and Demand of Thai Surf Tourism

Given the profound growth in surf tourism around the world and the robust tourism industry in Thailand, it is likely that the awareness and demand for surf tourism will increase in Thailand. Buckley (2002a) identifies that prior to 2002, there had been very little practical or theoretical investigation into global surf tourism and therefore research and understanding were found to lag behind the growth and changes in the industry itself. However, in the case of Thailand, the literature may be in lead of the industry (e.g. Martin & Assenov, 2008; Martin, 2009; and the publication of *Thailand Surfrider Magazine*), while the surf news, travel, and surf clothing industries (Surfers Village, Saltwater-Dreaming.com, Quiksilver, etc.) may be a leading driver of the media which creates awareness and demand of Thailand as a surfing destination.

The genesis of surfing Thailand in the media

During the previous decade, there has been a genesis of a new body of literature relevant to this research: the surfing Thailand literature. The emergence of the surfing Thailand literature indicates the growth in awareness of surfing in Thailand. The literature on surfing Thailand identifies that surfing and surf tourism exist in Thailand and are gaining popularity, while representations of surfing in the media are primarily twofold: on one hand the local surf clubs and surf contests are behind the increase in attention to the sport; on the other hand businesses, such as Phuketsurf.com, Phuket.com, and Saltwater-dreamin.com, for example, promote surf tourism in the online media in support of entrepreneurial interests. The former was central to surf-clothing manufacturer Quiksilver having significantly increased the attention to the area through press releases related to their sponsorship of surfing contests, namely the inaugural Thailand Surf Series launched in 2009.

This research identifies that the printed materials related to surfing in Thailand, alongside information presented on the internet, including those launched from the Phuket Boardriders Club and the international surf media, have raised awareness to the sport as well as the opportunities and access to information for surf tourists. As awareness of surf tourism increases, tourism-dedicated web sites such as Phuket.com and Phuket.net have added and expanded web pages which list areas and opportunities for surf tourism. Japanese magazine companies have been especially ardent to promote surf tourism to

Thailand and indeed the surf tourism survey conducted at Kata Beach by the researcher identified that Japanese surf tourists are visiting Phuket (Martin & Assenov, 2008).

Approximately seventy-five percent of the current and extant literature was written or published during the three-year course of study encompassed in this research, and academic and non-academic materials alike are linked to travel and tourism. A series of academic materials generated by the researcher between 2008 and 2010 have brought the discussion of surf tourism in Thailand into the wider surf tourism research literature. The three previous studies by the researcher are the only academically-orientated research conducted on surfing in Thailand wherein Martin and Assenov (2008) and Martin (2009) were first to systematically undertake an exploration of the Thai littoral for surfing.

The growth in popularity of surfing in Thailand alongside the associated literature is hardly a decade old. The awareness of surfing in Thailand originates mainly from travel magazines, surf magazines, travel guides, and the TAT among others, and illustrates the novelty and new-found commercialization.

The paradox of increased awareness and demand

Awareness of surfing and surf tourism resources is clearly on the increase in Thailand and abroad, and this is evident in the both the online media and in the literature. Implications of the increased awareness include positive and negative attributes and may include a myriad of perspectives depending on the stakeholders in question.

Positive implications:

- Increased awareness in international tourists may bring an increase in tourism receipts during the low season.
- Increased awareness may bring an increase in coastal conservation and management as authorities incorporate the awareness of surfing resources into their coastal planning.
- Increased awareness in surf tourism may benefit tourism safety as residents, domestic tourists, and international tourists become aware that the monsoon season is synonymous with high surf.
- As the image of surfing is globally recognized, increased awareness may produce positive imagery for Andaman and Thai tourism.

Negative implications:

Buckley (2002a) notes that surf tourist response to crowding, together with increased pressure on natural or cultural host environments are indicators of surfing space capacity, and such thresholds were generally low and could be reached very rapidly. Tantamjarik (2004) identifies that crowding and pollution as the most commonly cited concerns among surf tourists in Costa Rica. Similarly, this research has shown that the increase in awareness and demand for surf tourism products and space has tangible consequences. Based on personal interviews with surfers in Thailand, the following points are raised for discussion:

- Depending largely on the attitude of individual surfers, an increase in awareness and participation of surf tourism was perceived to bring an increase in dissatisfaction among Thai and foreign resident surfers.
- Increased awareness and demand for surf tourism may compromise the surfing space enjoyed by surfers.
- Social tension among surfers will increase as competition for surfing space increases.
- Available surfing space was found to be a leading factor in expatriates choosing Phuket as a place of seasonal or long term residency, and an increased demand and awareness may compromise their resolution to live or invest on the island.

Tourist demand

Indeed there is an increasing demand for the surf tourism resources. The demand for surf tourism was first identified in Martin and Assenov (2008) who identify that surf tourism is imminent, especially at Kata Beach in southwestern Phuket. The largest market segment was identified as European; while North America, Australia, New Zealand are significant. Furthermore, there is a regional market, particularly Japanese. This is evident in the surfing Thailand literature and in the surf tourist survey conducted by the researcher. Martin and Assenov (2008) identified the following characteristics regarding the demand for surf tourism:

- Less than 40 % those interviewed were 'surf tourists' and therefore, given that surfing was a primary focus of their travel to Phuket, they

were aware of the resource and tourism opportunity when planning their vacation.

- Approximately 60 % were ‘surfing tourists’ and were generally unaware of the resources and opportunities of surf tourism until they actually visited the beach, saw surfing taking place, and realized the opportunities to take lessons or rent surf boards.
- Surf tourists had a myriad of other interests, including other water sports.
- The Free Independent Traveler (FIT) market (over 85% of those interviewed) is the current key market segment, and these individuals are looking for beach tourism experiences.
- Demand for an increase in surf tourism products, namely surf lessons, surf schools or surf education was realized by 33% of the interviewees, while 18% felt there should be more and better quality surf shops.
- Along with the demand and awareness in surf tourism, there was a noticeable demand for clean beaches and water, whereby over 50% of surf/surfing tourists rated water quality as ‘fair’ and 22% rated it as ‘not clean’. Similarly, 57% identified marine debris as unattractive and an explicit negative in an otherwise positive surfing experience in Thailand.

Thai and Foreign resident demand

Through the course of personal interviews, this study identifies that Phuket has a thriving Thai and expatriate surfing community. Pendleton (2002) refers to this phenomenon as ‘slow tourism’ whereby expatriates influence the market, recognizing the value of coastal tourism and considering the overall draw factors to the coastal tourism market. The expatriate community is largely behind the genesis of surfing in Thailand and personal interviews indicate that many see the rise in surf tourism as an invasion of their personal surfing space. Foreign resident surfers indicate that the prevalent coastal surfing resources in Phuket, combined with an abundance of surfing space, originally influenced their decision to reside, retire, or invest in Thailand.

Among Thai surfers, those who work in the surf tourism industry were more open to the increase in awareness and demand for surf tourism than Thai surfers who

were not involved in the surf tourism industry. In summary, Thai and foreign resident surfers alike were especially opinionated regarding this topic. Therein, the implications of the study identify that these stakeholders have a vested interest in surfing areas and surf tourism, and shift the discussion from an environmental focus toward a social focus. In this context, Mach (2009) identifies that an informed civil society and social entrepreneurship are the keys to driving surfing tourism towards sustainability in the face of increased demand and awareness.

4.1.3 Surf Tourism Resources of the Andaman Coast

This research is focused primarily on the surfing resources of Thailand and the physical environment, and it is from this position that the discussion on Andaman coastal resources and surf tourism is consigned. The documentation of surfing areas has the potential to spawn the conservation of the resource, as suggested by Scarfe et al. (2009):

For the best environmental result, recognition is required of surfing amenities as specific natural resources in coastal plans and environmental legislature to facilitate their protection and enhancement. For example, a coastal plan that identifies surfing break locations, the physical processes that cause the quality waves to form, and the threats to wave quality gives greater weighting to any concerns that a coastal engineering project may jeopardize the surfing break (Scarfe et al., 2009: 701).

Implication of commercial surf tourism

With regard to commercial surf tourism, we must consider whether Thailand's resources are adequate and conducive. Surf tourists may seek or require high quality waves, if indeed their primary motivation for travel is surfing. Nonetheless, we must consider the background of tourism in Thailand, including a well-established beach tourism market. In this context, surf tourists may accept less than perfect surfing waves in consideration for other tourism experiences. This is to say that even if surfing is the primary purpose to visit, other considerations may be included in the decision process, such as nightlife, cultural experience, sightseeing, costs (especially accommodations), and food. Similarly, surfing tourists may have a lower expectation of the resource and be most willing

to accept less than perfect surfing conditions; rather they seek a more holistic tourism experience in Thailand, including Thai beach activities, culture, food, etc.

At the time of writing, commercialism of surf tourism in Thailand is in a state of genesis, appearing as a new and novel addition to a number of travel and tourism web sites such as Phuket.com, Phuket.net, Saltwater-dreaming.com, and others. However, as Buckley (2002a) notes, areas with limited surfing resources can quickly reach carrying capacity, and the current research identifies that Thailand's surfing resources are uniquely limited by a host of natural and physical parameters.

Inventory of the resource

At the time of writing, the researcher has identified approximately 61 areas on the Andaman Coast (and 31 on the Gulf of Thailand Coast). As aforementioned, this is certainly not an exhaustive account, rather it represents surfing areas located and assessed by the researcher prior to July 2010. In overview, there are relatively few areas conducive to surfing and surfing areas are somewhat clustered around specific areas in Phuket and Phang Nga provinces. Furthermore, the resource is rather limited in all other provinces and highly dependent upon specific swell directions, which tend to be highly seasonal, unpredictable, and inconsistent.

Interrelated coastal resources

Coral reefs as a coastal resource for tourism are manifest in activities of snorkeling, diving, fishing, and recreational surfing. As with other tropical areas, surfing waves in Thailand mainly occur either on beaches (beach breaks) or on coral reefs (reef breaks). Thailand has very few, if any, surfing areas on rocky ledges or rock shelf areas (author field research 2007–2010). According to the World Bank (2006), over 80 percent of reefs along the Andaman Coast are in a 'fair', 'bad' or 'very bad' condition and are at risk of continued degradation.

Certainly, the health of Thailand's coral reefs is relevant to the discussion on surfing resources as indeed some surfing areas are reliant on the coral reefs in the formation of waves. Coastal fishery and aquaculture projects may be of significance to surf tourism relative to issues of water quality. For the most part, mangrove areas are not surfing areas, yet the overall ecology of the coast is interrelated.

In relation to the legacy of tin mining, this research has identified that there is a connection between reefs destroyed during the mining era and surfing areas. Tin mining affected the contour of the bottom through destruction and sedimentation, and further research is needed to better understand these impacts.

Implication of wave types on the Andaman Coast

The discussion on the availability of surfing waves of the Andaman coast is dominated by the issues surrounding the phenomenon of the southwest monsoon. This phenomenon may produce consistent waves for surfing and indeed the quantity of waves may, depending on the subjective opinions of an individual surfer, mitigate the quality of waves. This is to say that overall, surfers require waves, and may be willing to sacrifice quality for quantity alongside issues of capacity and crowding at surfing areas.

Swell directions and swell windows are the significant aspects for investigation and they are correlated with the weather phenomena which generate the waves. The following notes are in a prospective context:

- The southwesterly monsoon weather pattern generates windswell from the southwest through west, and the narrow regional swell window (through The Great Channel) restricts surfing waves from reaching the southern provinces of Krabi, Trang, and Satun.
- Indian Ocean groundswells are distinctive given the quality of the waves and the potential to arrive throughout the year, including the high season when weather conditions on the Andaman Coast are highly favorable. However, the swell window for Indian Ocean groundswell (through The Great Channel) is measurably narrow whereby only explicit swell directions are favorable.
- Cyclonic storms, including depressions, tropical storms, and cyclones, may propagate large swells ranging from the southwest through northwest. Depending on the location of a specific storm, the ocean swells they create may either directly pass through The Great Channel or the Ten Degree Channel, or if waves propagate west of these channels, have a direct hit on Thailand's Andaman Coast. Related implications include that northwesterly swells directions enter the Andaman southern region of Krabi, Trang, and Satun provinces. Overall, these storms may generate

regional groundswells or wind swells with a significant degree of westerly swell direction and send ocean swells which have a direct hit on the Andaman Coast, and these storms can produce high quality waves at a variety of locations including the southern provinces.

Conversely, in a judicious context, the researcher estimates that groundswell activity in the region may account for as much as fifty percent of the total swell activity; however the southwest monsoon wind swell and windsea mitigate or ‘mask’ the groundswell. This is to say that the monsoon wind flow runs counter-productive to the groundswell in terms of the implications for surfing on the Andaman Coast. Therefore, groundswells are normally only ‘surfable’ during the absence of the southwest monsoon wind-flow, or when especially strong/large groundswells are produced by regional storm activity, such as depressions, tropical storms or cyclones.

Swell types were found to be highly significant to the region in as much as while one beach may favor windswell conditions, another may require groundswell conditions and this is mainly attributable to bathymetry and other topographical factors. For example, the reef at Laem Pakarang area in Phang Nga requires groundswell to break favorably for surfing, while Nan-Thong Beach in nearby Khao Lak favors monsoonal windswell. This example moves to indicate the limitation of the resource, i.e. specific conditions are required for ‘surfable’ waves at each coastal area. While such dialogue may be considered relevant to all surfing areas in the world, it is of particular significance to the Andaman Coast given a number of parameters outlined in this research, including bathymetry and narrow swell windows.

Results for the six provinces on the Andaman Coast varied in detail depending on the data and the evidence for surfing resources collected and the following discussion is framed in this circumstance.

Implications for Phuket province

The research found that Phuket, with a minimum of twenty-nine areas identified, is the province with the most frequently occurring high surf and greatest number of surfing areas. This is attributed mainly to the favorable bathymetry and coastal topography of the island. Water depth along the west coast of Phuket, especially the southwestern coast, is the deepest (both inshore and offshore) among all six Andaman provinces (See Figure 3.5) and therefore surfing waves in Phuket are the generally the largest and most powerful in Thailand.

In overview, surfing areas in Phuket are somewhat clustered in the Nai Yang coastal area (see Figure 4.1), the Pansea, Surin, and Laem Sing coastal area, the Kalim Beach area (which has more than one surfing area on the local reef), and the Kata Yai – Kata Noi area (See Figure 3.16). Discussion on the implications for the clustering of surf sites is forthcoming in section 4.1.8.

Implications for Phang Nga province

Phang Nga has the longest coastline of the Andaman provinces and the second largest inventory of surfing resources with a minimum of sixteen surfing areas. These surfing sites are clustered in the Khao Lak/Laem Pakarang area (see Figure 4.2) and to some extent in the Na Tai Pier area (Khao Pilao Beach). Therefore, alongside the given weather conditions and wave activity of the Phang Nga littoral, it is reasonable to conclude that out of 216 kilometers of provincial coastline there is relatively limited surfing space.

As with the entire Andaman Coast, Phang Nga's surf is predominantly driven by the southwest monsoon (May to October) along with the Indian Ocean groundswells that can hit any time of year. However, Phang Nga has a larger south-southwest swell window than Phuket; it also has a shallow and wider continental shelf which negates much or all of the advantages gained by the increased swell exposure, resulting in waves with generally less power and punch than similar breaks on Phuket. Furthermore, given that Phang Nga receives higher rainfall and has more creeks and streams, water quality is generally lower than Phuket (see section 4.1.5 for discussion on water quality and surf tourism on the Andaman Coast).

Implications for Ranong

Ranong was found to have negligible resources for surfing, other than Ao Yai Beach on Ko Phayam, which receives wave activity from both windswell and groundswell and can offer a degree of surfing opportunity year-round. However, access for surf/surfing tourists is a key issue as travel by ferry is required to reach the island. Favorably, the beach is open to groundswell, while unfavorably it is open to monsoon wind flow. Furthermore, while the area has a more favorable swell window than Phuket for groundswells generated in the Southern Indian Ocean, the regional bathymetry is less favorable than Phuket. This is to say that groundswell must pass over a wide continental shelf (20–40 meters depth) at a southerly angle and cross nearly one full degree of latitude before arriving at the island. Of note, the inshore bathymetry is in the 0–20 meter range which is comparable to Phuket. Regarding other swell types and directions, the island is sheltered by Zaddetkyi Kyun Island and Than

Kyun Island of Myanmar's Mergui Archipelago to the north and west respectively. Just north of Ko Phayam, Ko Chang is further sheltered from southwest swell by Ko Phayam and the west by Mergui Archipelago and is not discussed herein.

Overall, the Laem Son area, including Bang Ben Beach, is fronted by a 10 kilometer shelf of 0–20 meters and has comparatively less-favorable inshore bathymetry than Ko Phayam. Similar to Ko Phayam, the continental shelf at the latitude is approximately 60 kilometers at 20–40 meters. This is particularly relevant to groundswell activity, which is slowed and weakened considerably (in comparison with Phuket and the southern portions of Phang Nga). However, some degree of windswell is able to penetrate the area and surfing waves can be found there at times. It is improbable that the Laem Son area would support surf tourism given the poor quality and frequency of surfing waves.

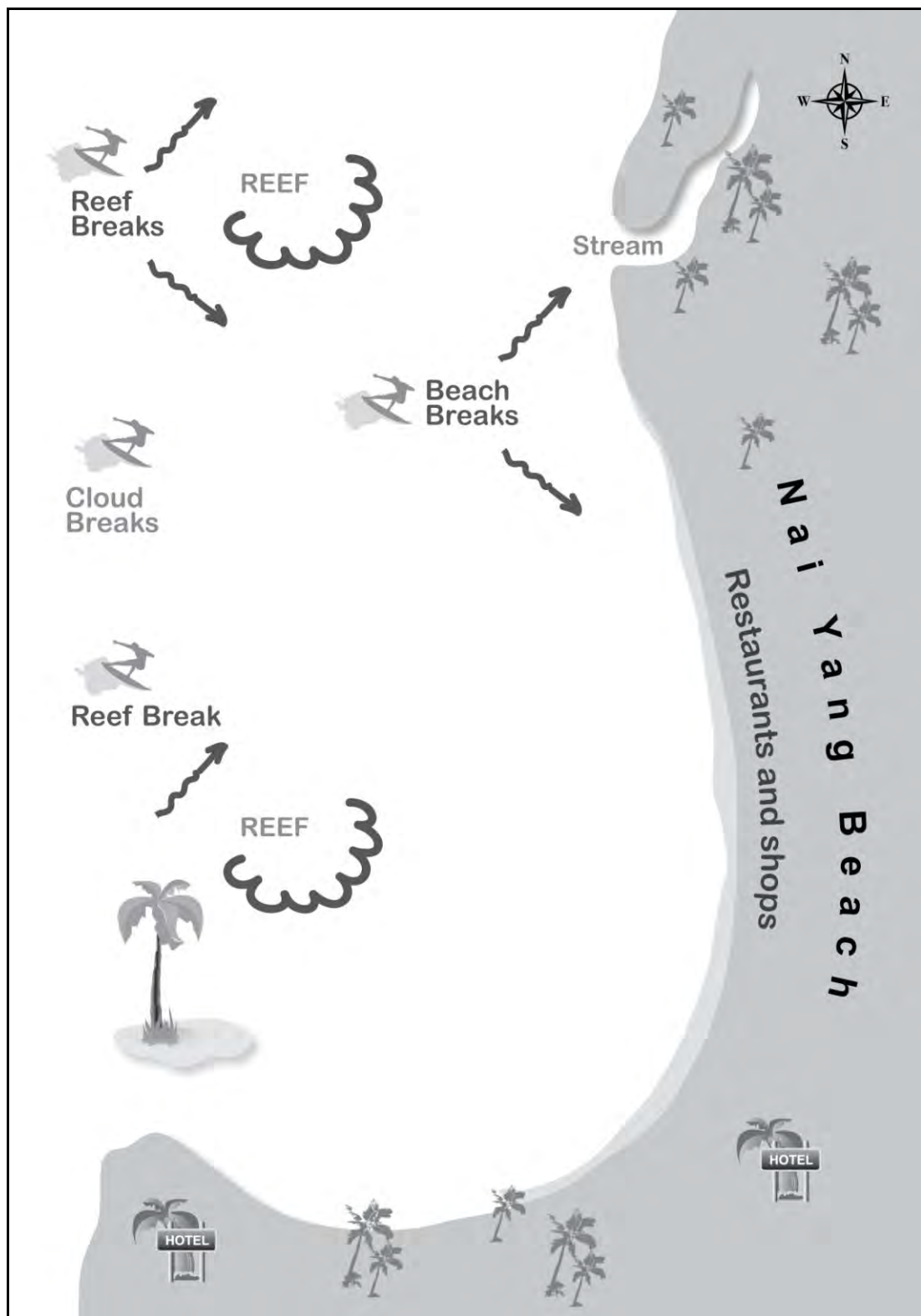
In summary, the definitive area for potential surf tourism in Ranong is Ko Phayam and this area may be of particular interest during the high season when southerly groundswells can produce quality surfing waves. However, given the paucity and size of swell during the high season, planning a surf vacation with a lead time poses a limitation to developing surf tourism as an industry on the island.

Implications for surf tourism in the Northern Andaman provinces

As aforementioned, surfing areas are somewhat clustered in Phang Nga and in Phuket. Implications include the potential to earmark specific areas as surf tourism destinations as well as to heighten their level of conservation in context to surfing. The researcher identifies four surf sites in the Nai Yang area of Phuket and nine surf sites in Khao Lak area of Phang Nga and as focal points for future surf tourism and related conservation, as identified in Figures 4.1 and 4.2 respectively. Implications to this end are discussed in section 4.1.8 (sustainability and conservation of Thai surfing resources).

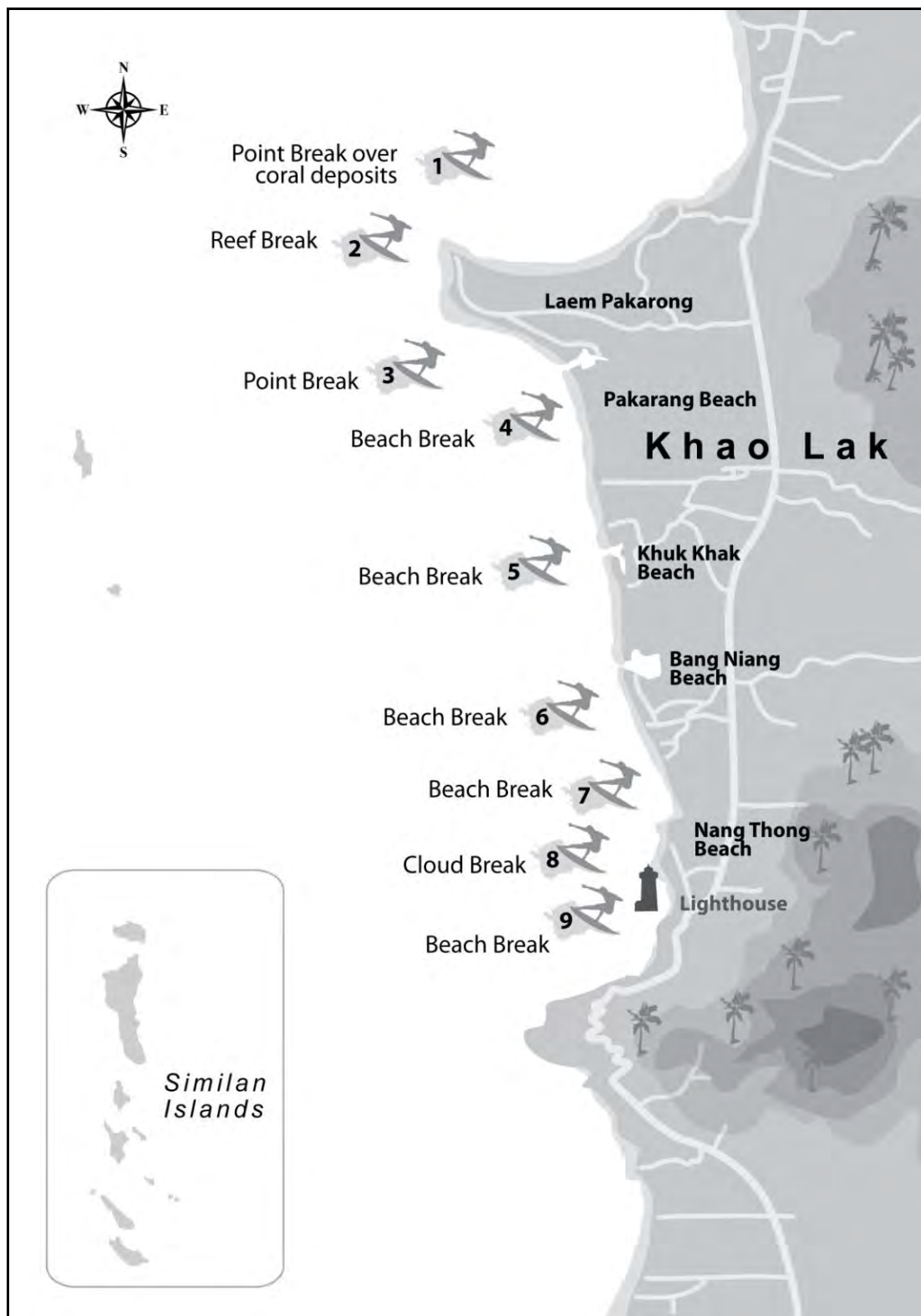
Overall, the Northern provinces have ample amenity for surf tourism and hotels are run at particularly low occupancy rates during the monsoon season. This is especially the case for Phang Nga and Phuket provinces. Furthermore, access to surfing areas in Phang Na and Phuket is clear-cut, whereby surfing resources are for the most part near the coast and open to public access. Ko Phayam Island in Ranong province has fewer infrastructures and requires travel by public ferry, but is nonetheless accessible year-round.

Figure 4.1 Surfing Areas of Nai Yang Beach



Source: Author

Figure 4.2 Surfing Areas of Khao Lak



Source: Author

Implication for surf tourism in the Southern Andaman provinces

Krabi, Trang, and Satun are the three southernmost provinces on the Andaman Coast and all of the surfing areas identified thus far are limited to islands and lie in national park waters. Therein the implications for surf tourism adhere to the insular region. Region bathymetry is less favorable than Phuket with a wide continental shelf in the 20–40 meter range of depth (save for the western islands of the Tarutao National Park). Swell directions are of particular consideration to surfing in the region as follows.

The southern provinces receive minimal southerly groundswell from the Indian Ocean due to the shadowing affect of Sumatra. The regional swell window to the Indian Ocean (as distinct from the Bay of Bengal) is narrow and limited to The Great Channel. However, relative to the direction of the groundswell, southwesterly swells may refract around Banda Aceh, Sumatra, and enter into the region to produce surfing waves at west-facing beaches, such as those on the west coast of Ko Lanta. This is to say that as waves pass through The Great Channel and radiate into the Andaman Sea, there is a measurable change of direction which is highly significant for the southern provinces and explains why indeed southwesterly groundswell can enter the south Andaman area of Krabi, Trang, and Satun to some degree.

Comparatively, Krabi, Trang, and Satun receive less southwesterly windswell than Phuket and Phang Nga. However, as with groundswells, southwest to west windswell can indeed penetrate the south Andaman area and bring surfing waves to west facing beaches in the region, such as the Ao Phante Malaka area of Tarutao island. Potentially, such areas may receive monsoonal windswell with limited affects from local winds (when compared to the Northern provinces). This is to say that such areas may receive waves while not being as adversely affected by the associated winds as Phuket and Phang Nga.

Additionally, westerly and northwesterly swells produced by Andaman storms or cyclones can enter the southern Andaman sea area and bring quality surfing waves to these provinces. This is especially of interest for those reefs and beaches which face west through north in the Trang and Satun areas. Of lesser consideration, there is some degree of fetch (the length of water over which a given wind has blown) between Sumatra and Thailand's Andaman Coast wherein local winds may generate some degree of localized windswell or windsea in the region.

Of practical concern, access to these areas during periods of wave activity poses considerable challenges for two reasons: first, as these surfing areas are found in national park waters, access may or may not be permitted depending on the season of travel; and secondly, adverse weather condition pose physical and safety challenges to reach these areas and local ferries may or may not be operational during these months. Logistically, given the inherent challenges of making sea voyages during the southwest monsoon coupled with the closure of the national parks in the southern region, developing recreational surfing and surf tourism in these regions poses foreseeable challenges.

Lastly, the remoteness of these areas is relevant to the discussion on amenities for tourism alongside concerns over water safety (considering the lack of water safety services and medical facilities). Of special consideration, Ko Ngai, Ko Muk, and Ko Kradan (Trang province) have tourism amenities and are more accessible during the southwest monsoon than is insular Satun.

Relative assessment of natural surfing resources for the Andaman Coast

As aforementioned, implications for surf tourism by province include a host of topics which include: swell types; directions; accessibility; seasonality; wave frequency; amenity; socio-cultural considerations; and water safety. Table 4.2 offers an indication of surf tourism resources alongside related implications. Table 4.2 is based on the relative comparison among provinces (e.g. provinces are compared relative to each other). As Phuket has been determined as the key province for surfing and surf tourism activity, it provides a benchmark whereby all other provinces are compared. The scale provided herein has five points: very poor, poor, fair, good, and very good. Some rating may be segmented, such as 'fair to good'. Ranong, Krabi, Trang, and Satun are recognized only as insular areas for surfing and therefore coastal areas are not considered in the rating scale.

Overall, Phuket province has nearly 50% of the surfing areas on the Andaman coast (29 out of the 61 areas identified so far) and it is unlikely that further exploration and discovery in other provinces will outweigh these findings. However, given the over 216 km. coastline and favorable swell window of Phang Nga province, it is probable that there are indeed a number of undocumented natural surfing resources, particularly in insular areas. Further exploration and documentation of natural surfing resources is needed on the Andaman Coast for a definitive analysis.

Table 4.1 Implications for Thai Surf Tourism by Province

province	swell and seasonality	bathymetry	water quality	water safety	access	amenity (hotel)	implications for surf tourism
insular Ranong	fair	poor-fair	fair-good	poor	fair	fair	fair
Phang Nga	good	poor-fair	poor	poor	good	very good	good
Phuket	very good	good	fair-good	fair	very good	very good	very good
insular Krabi	fair	poor-fair	good	poor	fair	good	poor
insular Trang	poor	poor-fair	good	poor	poor	fair	poor
insular Satun	poor	fair	good	poor	poor	poor	poor

Source: Author

4.1.4 Thai Water Quality and Surf Tourism

The Thailand surfers know; they are out there in the water during the monsoon.

(Dunbar, 2009 personal communication).

Although water pollution can be considered as an aspect of water safety, it is discussed independently as follows.

Richie (2010 personal communication) identifies that surfers in Phuket, as with any surf tourism destination, look for good water quality: “Surfing requires clean water and beaches, and water quality is a serious issue... if you get sick surfing an area you will not likely come back... nobody wants to go on a vacation to a polluted area.”

The results of this research indicate that there are water quality issues on the Andaman Coast in relation to the surf season. However, scientific analysis of water quality at surfing sites during periods of elevated surf, when waters are highly turbid, was unable to be conducted. Nonetheless, this study identifies that there are indeed two issues pertinent to Thailand’s fledgling new surf tourism industry regarding water quality, namely marine debris and water pollution. The former indicates the source of debris is primarily from littering in Thailand; the latter is attributed to pollution generated by a number of sources on land, such as construction sites and sewage from hotels. Additionally, anecdotal evidence suggests that there may be a relationship to the legacy of maritime and coastal tin mining. Lastly, this research identifies the aesthetic impact of water quality for surfing,

especially marine debris, which was found to be prolific on Andaman beaches during the southwest monsoon season.

Surfing and water quality in global context

Water quality is of particular relevance to the discussion on recreational surfing and surf tourism. In a global context, surfers are often at the source of the water quality debate and activism regarding environmental issues that adversely affect the surfer's quality of experience and health in relation to the ocean. For example surfers are known to campaign for clean and safe recreational waters; they are inclined to be proactive toward water quality issues, and may use "media catching images" and make "proactive arguments" (Jennings, 2007). Sewage pollution, pesticides and trash leaching are waterway polluters and surfers feel a major concern about these because they pose health risks for marine life and ocean users (Tantamjarik, 2004). As surfers are fully immersed in the ocean, they are very particularly sensitive to changes in environmental conditions and coastal pollution and water quality can negatively impact surfing (Nelson et al., 2007). Biophysical conditions that may mitigate against a surfers' physical health are indeed part of evaluating a region's surfing resources (Lazarow, 2008).

Surf tourism and water quality on the Andaman Coast

Water quality in select locations of the Andaman Coast range from degraded or severely degraded, while most beaches are generally in good condition (World Bank, 2006). The research found that many surfing areas in Phuket and Phang Nga are located near polluted coastal waterways. Many surfing areas are best during high tides when waterways purge or drain into the sea, especially after heavy rains during the monsoon. For example, most beach breaks in Phang Nga are located near areas where canals meet the sea (as these areas create the desired bathymetric conditions required for waves to break), and during high tides or heavy rains these canals discharge unpleasant smelling and discolored water directly into the surfing areas and surfers have been reported to have had health problems (Blauer, 2009 personal communication).

The research found both social and physical arguments regarding the negative implication of water pollution and surf tourism in Thailand. Physically, the water is notably polluted, especially in terms of color and odor. Behaviorally, given the background that surfers require, if not demand, clean sea water for surfing, and given that

this research identifies that surfers and surf tourists identify that the Andaman Coast indeed has a water quality issue, the implications suggests that if surf tourism is to be sustainable in Thailand, the issues surrounding water pollution will need to be addressed.

As identified in the literature and shored up in the results of this research, tin mining was been carried out extensively both on land and in coastal waters in Thailand, and the paradox among the tin and tourism industries was found to be highly pertinent to the topic of water quality in the context of recreation surfing. In terms of sustainability, the threshold is somewhat one-directional and the trade offs are best measured with long-term consideration for human and natural environments. While it is inexpensive to convert tourist space to tin mining activity, with immediate short-term high profits and taxes revenues from large companies; it is especially costly and problematic to convert tin mines to tourism space. This research finds that tin mining and surf tourism are mutually exclusive and jointly exhaustive. Nonetheless, the legacy of tin has rekindled in recent years, and as aforementioned, large scale tin mining is slated for revival on the Andaman Sea (Andaman Times, 2009).

The implications of marine debris on the Andaman Coast

Martin (2009) identifies that 57% of surf tourists at Kata Beach said that marine garbage was concerning, and the research found that trash on Phuket and Phang Nga beaches during the surf season (May through October) is prolific and indeed a problematic topic which is gaining attention of citizens, tourists, the media, and not-for-profit organizations, and, as this results of this research indicate, surfers and surf tourists alike. Overall, the results are inconclusive regarding the definitive origin of marine debris, and the amount of material at sea is nearly impossible to determine. However, albeit obvious, the rubbish is from people and is foreign to the natural aquatic environment.

This research has led to the conclusion that materials which appear degenerated or algae-covered have spent an extended time at sea, whereas materials which appear newer were more recently introduced to the environment, and likely originated from local canals and coastal sources. As such, the majority of marine debris found on Thailand's Andaman beaches has not been at sea for long, and this may indicate that the main source is undeniably individuals in Thailand.

The study shows that marine debris has a story to tell: it provides clues on how, when, where, and why the rubbish came to rest on the beach. This research found that

trash collected on Phuket beaches in 2007–2010 was of a variety of types as identified in the results. Based on identifying the labels of plastic bags gathered from the sea while surfing, an analysis of 1,127 plastic bags found that they are primarily Thai in origin (74%), followed by Indonesian, Malaysian, Burmese, and Indian. Other marine debris was attributable to the fisheries, such as fishing lines and cordage, while another type are plastics of various sorts, including rubber slippers and plastic toys. Therein, three types of marine debris were most prolific: plastic bags; three-dimensional plastics, such as water bottles; and materials abandoned by fisher-folk.

Blauer (2009 personal communication) offers personal experience for the Khao Lak area of Phang Nga province to the somewhat mysterious origin of the beach trash:

The majority of the trash with Thai labeling comes out of the creeks and rivers after heavy rains and originates in local villages and eventually get's washed down to the beach. I don't believe, and haven't witnessed, people intentionally throwing trash directly on the beach in Khao Lak area; most of it comes from an 'out of sight' kind of thinking (Blauer, 2009 personal communication).

Symptomatically, this study found that human behavior (why people are littering) as a key issue. The following insights may be gained from this research:

- Overall consensus is that marine debris comes directly from individuals who carelessly dispose of rubbish into the natural environment.
- The long-term integrity of natural environment is not valued by those who litter; thus from an economic point of view, the awareness, value, and long-term implications of litter are not recognized.
- There may be a gap in understanding and awareness among individuals, and the problem may be generational which suggests that if adults unscrupulously dispose of rubbish, new generations may continue the trend.

Seasonality and water quality

The research finds that there is a limited perspective regarding the issues of water quality today along the Andaman Coast, and this may be attributed in part to the seasonality of the issue. During the high season (December through February), when the vast majority of tourist arrivals occur, the predominant easterly winds carry the marine debris out to sea and away from the Thai coast, and rains are less frequent this time of year; thus runoff from the land and overflow from coastal canals nearly stops and turbidity is at an annual low. As a result, coastal waters appear clear and blue during the ‘high’ or ‘tourists’ season. However, when the southwest monsoon begins, approximately in April and marking the onset of the surfing season, the marine debris and turbidity return to Phuket. This study identifies that water quality is visibly and aesthetically a seasonal issue.

Positive and negative implications

It is probable that as the popularity of surfing increases on the Andaman Coast, surfers will raise the issue of water quality, and this will have positive and negative implications.

Positive implications include a raised awareness of the issue which can help to address the problem and lead to a solution, such as a call for action.

Negative implications include bad press and poor images of water quality among tourists and the wider global surfing community. Therein, if the tourism industry pushes to annualize the tourist season during the southwest monsoon, the discussion on water pollution and marine debris will expand. Overall, the sources of pollution on Thailand’s Andaman Coast are not well understood, and this research has shown through personal interviews that residents and tourists alike speculate regarding the origins and may assume wide variety of hypothesis. In terms of pollution, tin mining, tourism development and other sources were identified; in terms of marine debris, observation from residents, tourists and surf tourists alike suggest a number of sources, including Thailand, India, Malaysia, Myanmar, etc., and include plastic bags, toys, and water bottles, and debris from local fisheries, as the most prolific.

4.1.5 Thai Water Safety and Surf Tourism

The water safety aspect needs to be realized in Phuket, it is much more dangerous than it appears, especially for the lay person

Larry Davis, Aquatics Director, County of Hawaii
(2008 Personal communication).

To date, with the increase in tourist arrivals in the low season, there has been an increase in drowning. Thus, the drive of the tourism industry to address seasonality and to annualize the tourist season has implications in terms of water safety and the loss of human life.

The literature review on surfing in Thailand identified that there is a gap in academic material regarding ocean safety in Phuket. For the most part, local news articles and the international media have focused on the critical of the issues surrounding the increase in drowning on the west coast of Phuket, illuminating the loss of human life and the negative image surrounding this topic, and this study has identified water safety as a key area for discussion.

The majority of surfing areas on the Andaman Coast are absent of lifeguard services and therefore surf tourism and water safety are best reviewed in the Thai context. For example, given the safety issues outlined in this study, including the precarious state of lifeguarding services in Phuket and the complete absence of lifeguards in Phang Nga and most other areas, especially remote surfing areas, safety issues are identified as paramount to the discussion on promoting a surf-related water sports and tourism.

Physical environment

In Thailand, the physical environment has a unique set of bathymetric, topographic, and oceanographic factors which influence coastal areas relevant to the discussion on surf tourism. For example, short period swell brings a set of water safety concerns including waves breaking close together and windsea which can disorientate swimmers. Groundswells bring more forceful, deeper-travelling waves from the Indian Ocean. Short period swell may 'mask' the groundswell, effectively disguising the longer-period, more powerful groundswell. Strauss (2010 personal communication) observed that at Kata Beach, Thailand, groundswells may produce flash rips (feeder rip currents) as one

or more waves arrive, given their larger volume and force, produce a notably higher run-up on the beach, and given that they have different wave period than the short period swell. Therefore, the research indicates that different types of wave activity have different effects on Andaman coastal areas, and there may be more than one type of rip current and related consequences. Notably, the study finds that when effects occur simultaneously, they are additive.

Anthropogenic changes to coastal topography

Changes to the physical environment include those affecting the coastal bathymetry and topography on the Andaman Coast, such as the damage to, and health of, coral reefs, as well as the effects from a long history of coastal tin mining. In terms of ocean safety, changes in the coastal bathymetry and topography are likely to have had an effect on inshore currents, such as reefs that may have once slowed waves, especially groundswells, and afforded an added degree of protection from the surf. However, further discussion regarding the affects from tin mining on surfing areas is beyond the scope of this research.

Surfer-lifesavers

As this research has shown, Thai and foreign resident surfers are actually filling the void in water safety. Interviews with the surfing community showed that nearly every Thai or foreign resident surfer interviewed, 56 in all, had a story to tell regarding a personal water safety experience or rescue at Phuket beaches. The majority of the victims rescued were indeed tourists. Therein, as identified in the results of this study, surfers regularly rescue swimmers in Phuket. Fein (2010) notes that surfers are playing a role as “unsung heroes” in the prevention of surf-related drowning on the Andaman Coast.

High season wave activity

Surfing waves during the high season pose a unique set of safety issues. The research identified that for the period 2007–2010 approximately five days per month with some degree of ‘surfable’ waves surf at select areas. This is especially the case during the shoulder seasons. Surf at these times is mainly groundswell (long-period swell). Implications include that tourists may not anticipate the arrival of the waves as the ocean may appear calm for some time until a series of waves unexpectedly arrive.

Correspondingly, in the absence of offshore sand bars during the high and shoulder seasons, waves may break close to shore with considerable force and pose additional hazards and concerns regarding surf-related neck and spinal injuries (see Appendix I: Plunging Breaker at Kata Noi Beach, Phuket).

Positive implications

Surfers are rescuing swimmers on Andaman Coast beaches, and personal interviews by the researcher indicate that the vast majority of these surfers are experienced in the sport and in Thai waters. Therefore, it is logical to assume that the more experienced surfers there are in the water the higher the number of distressed swimmers who will be aided by surfers. To a lesser degree, the research finds that surf tourists and surfing tourists have assisted swimmers in Phuket.

Surf tourism may indeed shed light on the water safety issue. For example, acknowledging that in fact the low season is a surf season, when waves create rip currents, may raise awareness of related issues. This is to say that if the safety message reaches the swimmers from a variety of sources in the travel industry, the media, and by lifeguards, they are better able to make an informed decisions regarding swimming in the surf.

Negative implications

If surf tourism is promoted on the Andaman Coast it may attract novice surfers and ‘surfing tourists’, raising further concerns for public safety. Tourism marketing strategies, including those from hotels, travel companies, and web sites, may not realize the implications of promoting surfing on the Andaman Coast and water safety issues may increase.

Secondly, tourists may choose not to book a vacation to the Andaman Coast if they feel it is unsafe for family members. For example, if they perceive the low season as a ‘surf season’ this may influence their decision not to visit Thailand’s beaches during this time of year. Overall, if the issue is left unchecked, the negative imagery already reputed in the media will increase.

4.1.6 The Value of Surf Tourism to Thailand

The value of surfing and surf tourism may be difficult to accurately measure. Kelly (2008) identifies that coastal values are not well understood, especially coastal fishing and surfing. The value of surfing in Thailand, in a socioeconomic context, may include the potential for domestic surf tourism, especially Thai and foreign residents from Bangkok; international surf tourism, including ‘surf’ and ‘surfing’ tourists, as well as those surfers who may see Thailand as a stopover or warm-up grounds for other regional surf tourism destinations; Thai/foreign resident recreation as a non-market value (to be discussed herein); and the overall value of the image of surfing in Thailand (to be discussed herein).

Types of surfers germane to Thailand

- Surf tourists vs. surfing tourists (Ponting, 2008) are distinctive market segments.
- Hard/soft/incidental surf tourists (Martin & Assenov, 2008) have different needs and require different products and services
- Slow tourism vs. fast tourism (Pendleton, 2002) signals that in the valuation of coastal tourism, expatriates may gradually yet significantly influence the market. In a socioeconomic context, expatriate surfers in Thailand represent slow tourism through mentoring and sponsoring Thai surfers, local surf clubs, and their participation in surfing contests.

Market value and non-market value

- Non-market value may include foreign resident surfers who would not have otherwise been living in Thailand. The full value of these individual’s participation in the economy can be considered, including ‘slow tourism’.
- The value of surfing to the tourism industry includes that surf tourists have a high level of spending on local products, as well as a dynamic concern for social and natural environments (Hageman, 2006) and surfers in a given area contribute a surprising amount of revenue to the local community (Nelson, Pendleton & Vaughn, 2007).

The image of surfing in Thailand

The image of surfing has been exploited extensively, especially in the commodification of surfing and surf tourism (Buckley 2002a; Buckley 2002b; Buckley, 2003; Desmond, 1999; Hill & Abbott, 2009; Lazarow & Tomlinson, 2009; Lazarow, 2009; Lazarow, Miller & Blackwell, 2007; Lazarow, Miller & Blackwell, 2008; Mach, 2009; Nelson et al., 2007; Orams, 1999; Ormrod, 2005; Ponting 2001; Ponting 2006; Ponting, 2007; Ponting, 2008; Ponting, 2009; Reed, 1999; Shaw & Williams, 2004). Thus the value of the image of surfing to tourism marketing is somewhat obvious; however, the implications including resource limitations, water safety and quality, and the quality of social experience as capacities at surfing areas are reached runs counter intuitive. Nonetheless, in Thailand the image may circuitously serve as a value to the tourism industry in terms of water safety whereby tourists gain awareness and are alerted that there is in fact high and dangerous surf in Thailand.

Indeed, Thailand has vivid tourism imagery campaigns, such as the 'Amazing Thailand' tourism strategy promoted by the Tourism Authority of Thailand (TAT). Therein, there is a direct value to the tourism industry in terms of marketing. Between 2007 and 2009 the use of surfing images by local media increased by approximately 75% as identified in the literature review.

Assessing surfing capital in Thailand

'Surfing capital' is a schema for the value-recognition of surfing resources in both social and physical aspects (Lazarow, 2009). Therein, the socioeconomics of surfing has emerged as a leveraging tool to recognize the value of surfing areas and for the protection of coastal surfing resources. In New South Wales, Australia, coastal assessment studies are used to gain an understanding of surfing's economic contribution (AEC Group, 2009), and research has begun to identify the significance surf beaches for surfing and as valuable environmental habitat alongside the need for coastal protection (Lazarow & Tomlinson, 2009). Along with the rising popularity of surfing as an economic contribution to local communities, especially in regard to coastal management decisions and environmental conditions, such as the negative impacts due to changes in water quality (Nelson et al., 2007), the value of recreational surfing in terms of improved decision making for coastal environments in the context and need to consider negative impacts on

surf breaks and the natural environment (Lazarow, Miller & Blackwell, 2007) has led to the development of surfing capital.

Although this study found that Thailand is not a prolific surf tourism destination and surfing resources are limited by a number of natural factors, the study recognizes that indeed Thailand has surfing capital (Table 4.3). Surfing capital assimilates the socio-economic value of surfing in terms of the significant economic, social, and cultural importance of surfing amenity alongside the need to consider negative impacts resulting from development or coastal protection works on surf breaks (Lazarow, Miller & Blackwell, 2008). Using the items, descriptions and impacts set forth in the typology of surfing capital (ibid.), the researcher constructed a Thailand-specific paradigm (Table 4.3.).

Table 4.2 Typology of Andaman Coast Surfing Capital

item	description	natural or human impact
wave quality	-generally identified as low to medium quality waves. -generally assessed as messy windswell associated with the southwest monsoon.	-minimal encroachment by construction of coastal protection/amenity structures -currently artificial reefs are either in construction or in planning
wave frequency	- highly seasonal yet consistent between June and December -a mixture of short-period and long-period swell producing a variety of wave types and conditions.	-no sand management strategies in place on the Andaman Coast. -tin mining affected coastal topography and bathymetry -the surf at Kata Noi beach was adversely affected by beach grooming (Fekete, 2009 personal communication).
environmental	-environmental or biophysical conditions that may mitigate against a surfers' physical health are mainly water pollution from canals, hotels, and runoff after heavy rains.	- biological impacts include water quality from tin mining, construction, tourism, and marine debris. -amenity of the surrounding built environment comprises hotels and related infrastructure. -minimal or no issues related to marine predators (other than jelly fish stings).
experiential	-societal conditions surrounding the surfing experience are recognized as highly favorable. -frequency of waves may override quality of waves and other limitations	-post tsunami legislation has resulted in the indirect conservation of surfing areas in the advent of marine protected areas. -signage & education strategies are inadequate -minimal surf rage, aggression, and intimidation -mentoring from expatriates has fostered the growth of surfing in Phuket -local aesthetic placed in the Thai context, which is novel and touristic.

Source: Modified for the Thai context from Lazarow, Miller and Blackwell (2008)

4.1.7 Sustainability and Conservation of Thai Surfing Resources

Sustainability implies the protection and conservation of resources for future generations, as opposed to current unconstrained depletion.

Pizam (2010: 637)

Collectively, surf tourism research from around the world is stalwartly focused toward the concepts of sustainability, conservation, and management of surfing areas; it makes up the greater share of the available literature (Buckley 2002a; Buckley 2002b; Farmer & Short, 2007; Fluker & Hageman, 2006; Frood, 2007; Hageman, 2004; Hageman, 2006; Halsall, 1997; Hill & Abbott, 2009b; Hugues et al., 2005; Lazarow, 2007a; Lazarow, 2007b; Lazarow, 2009; Mach, 2009; Martin & Assenov, 2008; Martin, 2009; Murphey & Bernal, 2008; Nelson et al., 2007a; Nelson et al., 2007b; Persoon, 2003; Ponting, 2001; Ponting, 2005; Ponting, 2006; Ponting, 2007; Ponting, 2008; Sarfe, 2008; Scarfe et al., 2009; Scarfe, Healy & Rennie, 2009; Tantamjarik, 2004). Therein, it is a matter of fact area of discussion that the development of surf tourism in Thailand takes into account the knowledge of the wider surf tourism research with regard to the implications of the development of the activity on the Andaman Coast. The following discussion on surfing resources in Thailand explores three perspectives: the limitation of the resource, the management of the resource, and the rationale of identifying surfing reserves in lead of sustainability and conservation of surfing areas.

Limitation of the Resource

Although the results of this research confer that indeed there are surfing resources, the study indicates that Thailand's physical surfing resources are somewhat precarious and limited. Spatially, the research identifies that the Andaman Coast is 800+ kilometers including Phuket and others islands sustaining approximately 61 surfing areas identified thus far. With these figures in mind, the study takes into account that surfing areas on the Andaman are located predominantly in Phuket and Phang Nga, and furthermore, these areas are somewhat cluster together. In Phuket, surfing areas are mainly in the southern portion of the island where coastal topography and bathymetry are especially conducive to the formation of surfing waves. Nai Yang Beach, in the Sirinat National Park

in the North of the island is an exception. As Phuket was found to have 29 surfing areas alongside 36,822 hotel rooms (Tourism Authority of Thailand, 2007), this would indicate that there are 1,269 potential hotel rooms for each surfing area. As aforementioned in this research, Buckley (2002a) notes that surfing areas can quickly reach capacity and overcrowding of areas affects the quality of experience and strains natural resources. Therein, the potential for Phuket surfing areas to reach capacity signals the relative scarcity of coastal surfing resources.

Along the 216-kilometer Phang Nga province, surfing areas are especially clustered, with ten out of eighteen surfing areas being located along a single ten-kilometer stretch of coastline. Although Phang Nga is identified as having the second highest inventory of surf sites among Andaman provinces, there are approximately just eight surfing areas spread across 200 kilometers of coast. Therein, the ten areas clustered around the Khao-Lak area, and another four in the Na Tai Pier area are highly significant and bring to the fore the consideration of the appreciably limited surfing resources in the province.

Ranong Province, with prospectively one single beach (Ao Yai Beach on Ko Phayam Island) conducive to surf tourism, and the scattered (and infrequently ‘surfable’) surfing areas located in the insular areas of the southern provinces, further attest to the significant limitation of the resource, especially in the context of surf tourism development.

Of further consideration, as outlined in this research, ‘surfable’ waves throughout the region are highly seasonal, adding another layer to the circumstance of resource limitation. Therein, this research moves to identify the current level of management and conservation provided, or not provided, to these scant resources in the following sections of the discussion.

Management of surfing areas in Thailand

Although the research indicates that there are a number of coastal planning issues alongside a myriad of stakeholders, this research adheres to the straightforward perspective that surfing areas are not currently documented (save for this research) or integrated into the coastal management schema of Thailand. This is to say that given the identifiably limited and valuable resource at hand, Thailand’s surfing resources are unprotected per se. However, the research finds that a great number of surfing areas are

located in national parks and marine protected areas, and are therefore afforded some level of conservation by default.

As mentioned in the literature review on coastal resource management, Thailand has a considerable number of National Parks (NP) which affords some level of protection. Furthermore, resulting from the increased awareness and management following the 2004 Indian Ocean tsunami, Marine Protected Areas (MPA) were conceived and enacted in each province. As MPAs afford a significantly astute level of protection to specific and sensitive coastal zones, the further stand to circuitously provide a level of increased sustainability for surfing resources. As surfing areas have yet to be recognized in Thailand's coastal management planning, this research is not intended to provide an in-depth discussion on the implications of Thailand's current coastal planning regime; rather the study identifies to what extent surfing areas are tangentially afforded protection under existing NP and MPA strategy. Table 4.4 identifies the total number of surfing areas for each province in correlation with NP, MPA, and the most recent coastal management strategy, 'Biosphere Reserve'. As all of the National Parks with surfing areas are also under MPA status, they form a single category in Table 4.4.

Table 4.3 Thai Surfing Areas within National Park Jurisdiction

Province	Total number of surfing areas	National Park (NP) / Marine Protected Area (MPA)	Biosphere Reserve
Ranong	3	3	1
Phang Nga	18	3	0
Phuket	29	6	0
Krabi	4	2	0
Trang	3	3	0
Satun	4	4	0
Total	61	21	1

Source: Author

Table 4.4 identifies that theoretically, 21 surfing areas are under NP and MPA protection, and the premier surfing area of the province, Ko Phayam, is under the additional schema of Biosphere Reserve. In contrast, only three of Phang Nga provinces areas are under protection as NP/MPA. Phuket has six areas afforded NP/MPA protection (in the Sirinat National Park) which encompasses Nai Yang Beach. Of particular consideration, all of the surfing areas located in insular Krabi, Trang, and Satun are within

NP/MPA jurisdiction. Overall, approximately one-third out of 61 surfing areas are afforded NP/MPA governance.

In light of abovementioned discussion regarding the indirect management and protection of the NP/MPA may provide, the research moves to discuss the rationale for identifying ‘surfing reserves’ for the Andaman Coast of Thailand.

Rationale for surfing reserves for Andaman Coast, Thailand

As identified in the results and discussed herein, the Andaman littoral has just 61 surfing areas, and these areas are clustered in specific locations. This stands to reason that much of the vast 800+ kilometers of continental and insular coast is void of suitable natural surfing areas. Additionally, given the clear-cut limitations of the resource juxtapose with the prospect and potential for surf tourism amidst Thailand’s momentous tourism climate, the implications signal for the rationale and prioritization of ‘surfing reserves’ in Thailand. Following the Australian model of identifying prolific surfing areas for protection and conservation as iconic ‘surfing reserves’ (Farmer & Short, 2007), it is reasonable and plausible that the aforementioned clusters of surfing areas be designated as surfing reserves.

Table 4.5 identifies the rationale and prioritization for surfing reserves on Thailand’s Andaman littoral. The rationale has been built through the literature review, the results, and the discussion and implications of this research in the framework of surfing resources as valuable coastal resources. The consequence of the resource to the tourism industry is evident and imminent. In light of the spatiality and clustering of the resource, seven areas are identified for conservation status as ‘iconic’ surfing reserves. The prioritization provided in Table 4.5 is relative to each province, whereby the number ‘1’ represents the area best-suited for reserve status of each province. For practical reasons, only the Northern provinces are represented. Herein, the research identifies the Laem Pakarang area on the central Phang Nga coast and the Nai Yang area of northern coast of Phuket as the two most noteworthy areas for surfing reserve status (Figures 4.1 and 4.2).

Table 4.5 indicates that save for Nai Yang Beach in Phuket and Ao Yai Beach in Ranong, the remaining foremost surfing areas identified are currently not recognized in terms of conservation in Thailand’s ICZM schema, and therefore the significance and urgency to conserve these resources is most apparent.

Table 4.4 Rationale and Prioritization for Surfing Reserves in Thailand

province	surfing area	rationale	current status of protection	priority
Phuket	Nai Yang Beach and outer reefs	multiple reef breaks and beach breaks with a variety of waves, wave types and favorable seasonality	NP/MPA	1
	Kalim reef	potentially the best reef break in Thailand	none	2
	Kata & Kata Noi	the definite focal point of surfing in Thailand. Kata Beach support a wide variety of waves and conditions for surfing, while Kata Noi receives any and all swell sizes making it potentially the most consistent surfing area in Thailand on an annual basis.	none	3
Phang Nga	Pakarang	potentially the best surfing areas in the province with favorable seasonality	none	1
	Khao Lak area	unique cluster of surfing areas of Nan Thong Beach	none	2
	Khao Pilia Beach (Na Tai Pier area)	quality surfing waves in proximity to the Na Tai pier and a single offshore reef	none	3
Ranong	Ko Phayam (Ao Yai Beach)	potentially the best beach break located on an offshore island in Thai waters	NP/MPA/Biosphere Reserve	1

Source: Author

Furthermore, the development of surfing reserves invites surfers and surf tourists to participate in coastal resource awareness and conservation. It is well understood that sustainable tourism needs to maintain a high level of tourist satisfaction and ensure a meaningful experience to the tourists, raising their awareness about sustainability issues and promoting sustainable tourism practices amongst them (UNWTO, 2004; 2010), and as the social, economic, and environmental benefits of surfing breaks are realized, surfers are increasing integral to the overall integrated coastal zone management course of action. (Scarfe et al., 2009).

4.1.8 Thai and Mentawai Surf Tourism in Comparative Context

The literature indicates that surf tourism research has primarily focused on prolific surfing destinations, especially Indonesia and specifically the Mentawai Archipelago. As the most-researched surf tourism destination in the world, a comparative analysis offers

insight to surf tourism in Thailand. Geographically, the Mentawai Archipelago and Bangkok are equidistant from Phuket, and this point serves to identify the regional proximity between Phuket and the Mentawai islands.

Research in the Mentawai identifies that host communities have been largely disconnected from the economic benefits of surf tourism (Ponting, 2001; 2008). Pearsoon (2009) indicated that surf tourism in the Mentawai region may indeed be a new chapter in the regional exploitation of resources, with little benefits filtering into local communities. Comparatively, Thailand is unique and requires discussion explicit to the Thai context. For example, while surf tourism in the Mentawai is primarily hosted on ‘live aboard’ boats (a boat-based tourism) in a region with minimal land-based tourism infrastructure, and the market is focused on ‘surf tourists’, rather than ‘surfing tourists’, Thailand has a highly developed tourism infrastructure whereby land-based tourism dominates the tourism landscape, offering ample amenities for surf tourists and surfing tourists. Furthermore, while the Mentawai market is centered on package tourism, the Thai tourism environment is highly conducive to the FIT market (Free Independent Travelers), allowing for a wider distribution of tourism-related spending.

Comparing the prolific surf tourism industry in the Mentawai Archipelago with the emergent surf tourism in Thailand brings to light a number of specificities of the Thai market and places surf tourism in Thailand into the Thai context amidst the global market (Table 4.1). Regionally, Phuket is a gateway to the Mentawai for surf tourism charter boats which make port in Phuket for the off season and to undergo maintenance (Fekete, 2009 personal communication).

Ponting (2009) identifies the swell window of the Mentawai as especially wide and open to the entire Indian ocean, while the researcher has identified that the Thailand swell window is especially narrow and limited mainly to the Great Channel (between Banda Aceh and Great Nicobar) and the Ten Degree Channel (between the Nicobar Archipelago and the Andaman Archipelago). In terms of bathymetry, the Mentawai has very deep coastal waters (approximately 4,000 meters), while Andaman Coast Thailand has a wide and shallow continental shelf (approximately 50 to 200 meters). Although both locations suffered in the Indian Ocean Tsunami, surfing resources were not dramatically affected in Thailand or the Mentawai (Fekete, 2009 Personal communication). Table 4.1 offers a comparative framework for the prolific surf tourism destination of the Mentawai alongside the newly developing Andaman Coast destination.

Table 4.5 Thai Surf Tourism in a Comparative Context

Context	Mentawai	Thailand
maturity	prolific surf tourism market is well-established and globally recognized	emergent surf tourism market
	rapid onset of surf tourism industry (fast tourism)	slow onset of the surf tourism industry (slow tourism)
amenity	minimal tourism infrastructure	highly developed tourism infrastructure
access	limited access to surfing resources	straightforward access to surfing resources in coastal areas; access is problematic to insular areas during the southwest monsoon
	boat-based tourism with potential for land-based surf tourism	land-based tourism with minimal or no potential for boat-based surf tourism
coastal resource	coastal surfing resources with high potential for future development	limited coastal surfing resources coupled with environmental issues corresponding to the monsoon season
	swell window to the Indian Ocean is especially wide and open	swell windows are narrow and particularly restrictive
Coastal bathymetry	approximately 4,000 meters	approximately 50-200 meters
the 2004 Indian Ocean tsunami	surfing resources were not particularly affected	surfing resources were not particularly affected
surfing conditions	favorable weather/sea conditions during the surf season	unfavorable weather/sea conditions during the surf season (monsoon winds and seas)
	excellent surfing conditions (wave heights/wave types/winds/water quality)	less than ideal surfing conditions (wave heights/wave types/winds/water quality)
seasonality	surf tourism has spawned the tourism season	surf season runs counter to the current tourism season and therefore addresses issues of seasonality
	potential for year-round surf activity	surf season essentially limited to six months
commercialism	foreign-dominated entrepreneurialism	grassroots entrepreneurialism
	package tourism	free independent travelers (FIT)
	consumers are surf tourists	consumers are mainly surfing tourists and 40% surf tourists
economic implications	high-paying surf tourists; limited leakage; volunteerism (i.e. Surfaid)	surfing tourists with potentially wide and dispersed spending on local products
social implication	minimal foreign-resident surfing community	prolific expatriate surfing community
	minimal indigenous participation in surfing	moderate and expanding indigenous participation in surfing
research	highly researched area for surf tourism	New research area for surf tourism
Media and image	highly photographed and publicized by surf magazines, international surf media, and the surf clothing industry	emergent media coverage spawned through local surf clubs and entrepreneurial interests alongside global coverage through Quiksilver Inc. and related linkages.

Source: Author

Implications of the comparison

The implications of the comparison in Table 4.1 for Thailand include recognizing the slow onset of surf tourism in Thailand whereby foreign residents influenced the market through what Pendleton (2002) calls ‘slow tourism’ alongside Thailand’s amenity-rich tourism environment which provides an abundance of hotel rooms. Comparatively, the natural surfing resources of Thailand are very limited, with narrow swell windows and less than favorable wind, weather, and bathymetry. The surf season on Thailand’s Andaman Coast runs counter to the tourism season and therefore surf tourism favorably addresses the issue of seasonality. Commercialism of surf tourism is largely attributed to entrepreneurial Thais who provide surf lessons and board rentals, affording an opportunity for planned and sustained development at the local administrative level. Furthermore, the current surf tourism clientele are primarily FIT (Free Independent Travelers) who, similar to Hageman’s (2006) investigation of surf tourists in Lombok, may have a high level of spending on local products, as well as a dynamic concern for social and natural environments.

4.1.9 Interdisciplinary Context of the Study

As aforementioned and identified during the course of this study, surf tourism research was found to have a particular interdisciplinary nature, not only within tourism as a professional field, but within sociology, economics, and coastal studies in terms of ecology, environment, coastal management, and conservation. Academically, developmentally, and globally, surf tourism research is increasing, expanding in scope, and crossing disciplines. This is evident in the diversity of disciplines represented in the literature and through personal communications with scholars, and include urban and regional planning, human geography, anthropology, economics, sociology, socioeconomics, ecology, and in a variety of the sub-disciplines of oceanography.

In the context of surf tourism, the study found that sustainability, conservation, and coastal management are mutually dependent, principally in the context of the governance, socio-economic consideration, and bio-physical integrity. Therein, surf tourism research, as perceived in the touristic academy, includes the following fields of study: sport tourism, adventure tourism, marine tourism, water-based tourism, sustainable tourism, coastal tourism, tourism marketing, tourism management, recreational management, travel industry management, coastal zone management, and tourism planning.

Interdisciplinarity in the field study

This research took place on the vast Andaman littoral, a coastline previously uncharted for surfing resources; it was manifestly positioned in the Thai context and a diversity of disciplines of study were definitely incorporated into this study, such as physical geography and oceanography, including cartography, meteorology, climatology, bathymetry, ecology, and coastal studies and processes, and social science topics, including sustainable tourism and coastal management.

While the research approach included personal experience, interviews, and literature review, the framework and description of coastal resources was inevitably tailored to the Thai context, and the coastal resource assessment for surf tourism incorporated an interdisciplinary approach. In terms of exploratory research, the methodological consequence developed as follows: the exploration of surf resources, including waves, winds, and locations; natural environment, including beaches and reefs; water quality, including pollution and marine debris; safety issues, including ocean currents and drowning; built environment, including amenities; and the managerial state of affairs, including governance and public access. The field research finds that the overall linkages among stakeholders and the environment span three areas of understanding: management and impact reduction; socio-economic implications; and the greater bio-physical environment.

4.2 Conclusion

This research has presented the first academic discourse on coastal resource and surf tourism for Thailand. However, the motivation for this research was not purely academic; rather it was to foster illumination to a previously unexplored aspect of recreation and tourism in Thailand. To this end, the study provides new perspective on recreational surfing in Thailand. As discovered in the research and reviewed in the discussion, the following conclusion is somewhat universal and philosophical.

Three areas in the literature

The coastal resource literature reveals three elements particularly relevant to the integrity of the Thai littoral: tin, tourism, and the tsunami. While tin mining and tourism result from human activity, the tsunami was a natural calamity. The story of Thailand's Andaman Coast is a story of human and natural impacts, whereby sustainability is a key theme in the coastal research literature. The tsunami put the global spotlight to

coastal issues in Thailand with projects initiated through the United Nations, the Thai government, and international organizations from around the world, especially those from Western Europe. International collaboration and synergy through integrated coastal management is the current trend. Although the tsunami had a profound effect on coastal communities, indigenous fisher folk with their long-standing relationship to the sea appear willing to return to their aquatic activities (Sokhannaro, 2006) and this may demonstrate the resilience for marine activities, including surfing, in the post-tsunami atmosphere. This study identifies a gap in the Thailand coastal research literature regarding surf tourism and the awareness of surfing sites, and this thesis has aimed toward a discussion to these ends. The literature pertinent to Andaman coastal resources and their management reveals the uniqueness and diversity of habitats; it exposes the need to recognize, manage, and sustain the joint value of the coastal ecosystems, including those connected with the discussion on surfing areas.

The 'surfing Thailand' literature reveals the genesis of surfing in Thailand; as the literature itself is hardly a decade old with the majority of the material having been published during the course of this research (2007–2010). Although the researcher contributed to the literature and therefore inadvertently participated in its growth, it was the Phuket-based surfing clubs, surfing contests, and the global surfing media that put Thailand on the map through volunteerism, sponsorships, and media linkages.

The surf tourism research literature revealed explicit and emergent trends in the field, especially the call for management in the context of sustainability and conservation, the recommendation of recognizing the economic benefits of surfing breaks, and the need for the protection of surfing areas where coastal management decisions are made. Among the research community there is an evident call to conserve vulnerable natural surfing resources around the world. Furthermore, noted that as the social, economic, and environmental benefits of surfing breaks are realized, surfers are increasing integral to the integrated coastal zone management course of action (Scarfe et al, 2009).

Surf tourism in Thailand

The tourism industry in Thailand represents a significant sector in the kingdom's economy. Alongside cultural, heritage, medical, golf, and other areas, beach and coastal tourism is highly relevant and significant to Thailand, in terms of tourism receipts and foreign investment. Yet surf tourism had not previously been considered as a market

segment in Thailand, nor have the region's natural surfing resources been considered in the current coastal conservation framework.

Veal (2006) shows that indeed the environment is at the base of touristic activity and economy. This research indicates that for surf tourists, including those who visit Thailand, the environment may be especially relevant to their experience. As Thailand is a non-prolific surf tourism destination, tourists who come to Thailand for surfing come to experience the natural and cultural host environment and indeed these are Thailand's comparative advantages. We must consider the market and non-market value of surfing and the image of the beach. As Thailand has entered the surf tourism market relatively late in comparison with other tourism destinations, it can greatly benefit from the trials and tribulations of other regions and nations (i.e. late market entry may offer a comparative advantage in terms of the management and conservation of the resource).

The surfing environment in Thailand

The research has addressed the natural environment and related issues by documenting surfing areas as natural resource. The research finds that these resources are fragile and at risk of change and development from natural and human actors. For example, the tsunami and climate change are powerful agents of change, and the documentation and recognition of the natural resource endow the public with the knowledge that indeed these resources exist in Thailand and indeed they have value to society.

The research and discussion on pollutants which threaten the resource help us to identify that indeed the resource is vulnerable to careless human behaviors, namely environmentally destructive activities such as tin mining along the coast, sewage and other pollutants from hotels, and the disposal of rubbish and littering which are both physically and aesthetically damaging to coastal environs. The literature indicates that surfers serve as a signal for environmental advocacy and their increased presence in Thailand may lead to an increased awareness of water quality issues, especially those most obvious during the monsoon season.

Coastal research on the effects of the 2004 Indian Ocean tsunami had on surfing areas has never been conducted, this study included discussion with Phuket surfers with first-hand experience prior to and subsequent to the event. The general consensus is that surfing areas have returned to their pre-tsunami condition. Nonetheless, this study found that the tsunami has had lasting physical, psychological and institutional impacts.

Whereas the physical and physiological impacts may be seen as counter-productive to surfing and surf tourism, the institutional legacy of the event may provide the forward motion for the discovery and conservation of surfing areas.

Coastal management and surfing in Thailand

The research discovered that a significant number of surfing areas are located within national parks and marine protected areas, yet the existence of natural surfing resources are null and void in the wider research literature and conservation planning in Thailand.

Documentation of the resource and recognizing Thailand's surfing areas places the significance of surfing areas into context; it identifies their existence in the face of natural and man-made impacts. This research had identified the importance and applicability of integrated coastal zone management (ICM), and increased awareness of the resource may in fact lead to an increase in conservation through ICZM. Therein, this study opens a pathway to recognizing and understanding that the surfing areas can be taken into consideration when decisions are made on the conservation of natural areas and equally, in the case of the expansion of environmentally damaging commercial activities. The knowledge generated and outlined herein provides a holistic approach to understanding coastal use and management concerns. This study distinguishes the importance of coral reefs and other natural systems in protecting the coast and recognizes their congruence to the activity of surfing; it has laid the foundation for civil society and the government to react and conserve natural surfing resources.

Ocean safety in Thailand

The research found that surfers and surf tourists are inadvertently providing ocean safety to the tourism industry. Thus, in regard to the loss of human life on Thailand's beaches, the presence of surfers on the Andaman coast has proven fortuitous to the lives and safety of Thais and tourists alike. This research has offered insight to understanding the physical environment in terms of water safety, identifying and pinpointing ocean conditions and hazards relative to drowning. The assessment of the five beaches most notorious for surf-related drowning opens a new chapter of understanding the physical explanations behind the drowning so that the government and society can take appropriate steps to protect the residents and tourists from the loss of life. The study found that vast majority of

the coastline, an estimated 99%, is unguarded, and this may have implications. For example, although this research found that surfers have been actually providing a measurable amount of water safety in the region, the promotion of surf tourism to a wider market may invite novice and beginners who venture to unguarded areas and get into trouble. The research identifies that poor ocean safety record in Phuket has produced a negative and far-reaching image of surf related drowning and suggests that there are beach safety issues which are surf-related and relevant to the discussion, such as Thais, foreign residents, and tourists alike are drowning in the surf and these numbers are increasing per annum.

Concluding thoughts

Surfing and the environment – it all ties in

Kai Koholokai, Hawaiian health practitioner
(2010 Personal communication)

Ultimately, surfers depend on the health of the ocean, and this research has served to explore, inventory, and assess Thailand's natural surfing resources, and from this point forward the resource can no longer be ignored.

The research benefits Thailand by identifying and validating a renewable coastal resource which spawns economic activity. In recent years, and ushered by the events of the 2004 Indian Ocean tsunami, the Thai government, and indeed organizations from around the world, have mobilized to document, monitor, and conserve Thailand's coastal resources; yet natural surfing resources have yet to be represented in the conservation design. Therein, this research aids the Thai government and administrative bodies by providing a missing link to the current trend toward integrated coastal resource management, coastal mapping, and coastal GIS (Global Information System) documentation. Thus this study initiates a dialogue; it commences to fill the gap in awareness so that individuals and society can adopt an avant-garde approach toward recognizing and appreciating coastal surfing resources.

Recreational surfing in Thailand is inextricably linked to the discussion on coastal resources in terms of the physical and human environments. While coastal resources face intense and unanticipated change, such as those incurred by the 2004 Indian Ocean tsunami, human activities impose other pressures on the natural environment. Consequently,

coastal resources entail more than physical and tangible settings, they encompass the people who interact with the coastal environment and each other.

Thailand's Andaman Coast remains a mysterious and nostalgic place – in the minds of the people who make up the tapestry of coastal cultures – and in the memories of the tourists who come each year. Surfing areas are a coastal treasure only recently discovered in the Kingdom of Thailand.

Concluding quote

A celebrated Thai proverb attests to the significance of coastal resources in the Thai Kingdom:

ทรัพย์ในดิน สินในน้ำ

“Sap-Nai-Din, Sin-Nai-Nam”

“Treasure on the land, wealth in the water”

4.3 Recommendations

Definitive recommendations are presented in the following framework:

- Coastal resource management (CRM)
- Conservation of natural surfing resources
- Surfing reserves
- Promotion of sustainable surf tourism development
- Increase understanding of natural surfing resources
- Artificial reef and surfing amenity
- Promotion of surfing to Thai youth
- Improved and monitored water quality control
- Water safety awareness
- Rebranding the monsoon

Coastal resource management (CRM)

Thailand's surfing resources had never previously been assessed or documented and therefore they were not previously considered in the coastal management discussion. The research suggests that the resource is very limited, and given Thailand's touristic economy, the potential for over-exploitation is high. Therein, this research recommends that all surfing areas in Thailand be cosseted. Protection of surfing areas should be incorporated into the coastal management schema. Thai government organizations recommended to incorporate the knowledge provided in this research include but are not limited to: The Department of Marine and Coastal Resources (DMCR); The National Park, Wildlife and Plant Conservation Department (DNP); The Tourism Authority of Thailand (TAT); The Ministry of Tourism and Sports (MOTS); The Department of Fisheries (DOF); The Office of National Environmental Policy and Planning of Thailand (ONEP); and The Marine Environment Division, Water Quality Management Bureau, Pollution Control Department (PCD). Further recommendations within the CRM framework include:

- As discovered in the research and reviewed in the discussion, the researcher recommends that natural surfing resources be added to the criteria for recognizing and evaluating coastal resources.
- The management of coastal activities such as conservation programs, development, and tourism should be integrated more effectively to help

ensure the long-term sustainable development and protection of Thailand's coastline (i.e. integrate natural surfing resources into the CRM and ICZM schema).

- Integrate this research into GIS and coastal/participatory mapping schema.

Conservation of natural surfing resources is recommended

- Integrate surfing areas in post-tsunami planning of the coastal zones facing the Andaman Sea.
- Emphasize the importance and applicability of integrated coastal management (ICM) in providing a holistic approach to the coastal use and management of surfing areas.
- Recognize the importance of coral reefs and natural systems in protecting natural surfing resources.
- Bring together the appropriate national, provincial, local governments, technical expertise and local interests to discuss the significance of natural surfing resources.
- The value of natural surfing resources should be taken into consideration when decisions are made on the expansion of environmentally damaging commercial activities.

Surfing reserves are recommended

- Conservation of surfing areas, including those earmarked for potential 'surfing reserves', is recommended.
- It is further suggested to follow the Australian model of identifying prolific surfing areas for protection and conservation as iconic 'surfing reserves' (Farmer & Short, 2007).
- It is recommended that the aforementioned clusters of surfing areas be designated as surfing reserves. See Table 4.4, Surfing Areas within Nation Park Jurisdiction; and Table 4.5 Rationale and Prioritization for Surfing Reserves in Thailand for the justification and specifics for the conservation and protection of surfing areas in Thailand.

Promotion of sustainable surf tourism development is recommended

- In line with the surf tourism research literature, concern and action to support the sustainable development and maintenance of surf tourism areas and products is recommended.
- Given the early stage of development of surfing in Thailand, there is an opportunity for surf tourism to develop in a manner which benefits all stakeholders, and a sustainable approach is recommended.

Increased understanding of natural surfing resources is recommended

- Increase awareness of natural surfing resources as a coastal resource.
- Increase research and education opportunities for natural surfing resources.
- Increase stakeholder involvement, including cooperation in national and marine park management, for natural surfing resources.

Artificial reef and surfing amenity are recommended

- The development of surfing amenity is recommended, such as the construct Artificial Surfing Reefs (ASR)
- Future Artificial Reef (AR) developments in Thailand should consider surfing amenity in the design.
- Future Artificial Reef (AR) developments should consider the affect and implication (potentially negative) to natural surfing resources.

Promotion of diverse types of surfing to Thai youth are recommended

- Body surfing
- Body boarding
- Surfing
- Stand-up paddling (SUP)

Improved and monitored water quality is recommended

- Identifying the issues of water pollution that mitigate the resource is recommended so that civil society and the government can react to conserve the resource through enacting policy and education schemes. Therein, this research recommends that the issue of Andaman marine debris be traced from source to solution.
- This study recommends continued beach cleanups, education for the public at large, and a proactive approach geared toward the younger generation at schools throughout the island to improve water quality and reduce littering.
- Residual effects of tin mining era on water quality and coastal surfing resources can be examined, especially in the circumstance of renewed tin mining proposals.
- Improved sewage treatment systems at hotels are recommended alongside heightened regulations, monitoring and enforcement are recommended.
- Affects of continued tourism development on surfing resources is recommended.
- Mobilization of youth for coastal conservation.

Water safety awareness is recommended

Emphasis should be on education for the tourists, such as information from the tourism authorities and messages on the planes like we do in Hawaii, suggesting tourists to be careful and acknowledging that there are strong currents that can take you out to sea.

Larry Davis

Aquatics Director, County of Hawaii

As various interests in Thailand continue to promote tourism during the monsoon season, and indeed to better develop sustainable surf tourism, there are a myriad of safety issues which need to be addressed, and the following points are recommended:

- The delivery of appropriate information, further development of lifeguarding services, proper signage, trained surf instructors, and the availability of soft boards for beginners (which greatly reduce the risks of the individuals and all those who they may encounter in the water).
- This research recommends that any marketing campaign need acknowledge the associated risks, especially if attracting beginner and novice surfers, such as recognizing that many beaches are somewhat desolate, may not have lifeguards, and that strong currents are associated with short-period swell, windsea, and extreme changes in tides.
- It is recommended to protect against the loss of life, for ethical, humanitarian, legal, and economic reasons.
- For the tourism industry, it is recommended that liability issues be considered in the case of injury or drowning as hotels inviting surf tourists may be inviting a degree of liability.
- Surf tourism strategies are recommended to address the significant need for ocean safety.
- Water safety and ocean awareness should be promoted at beach parks and resort properties.
- Water safety and risk assessments should be carried out for each location.
- It is recommended that the safety issues surrounding the surf season be taken seriously by the government, hotels and businesses, and in the media.
- The study found vast areas of unguarded coastline, therefore caution in the promotion of surf tourism is recommended.
- It is recommended that the promotion of surf tourism take account of the safety issues related to the Andaman Coast and the monsoon season wave activity.
- It is recommended that water safety brochures with maps, diagrams, and illustrations of hazards and rip currents be produced and distributed which identify ocean currents and associated risks specific to each beach be (see Figures 3.21–3.24 as examples).

- Water safety videos are recommended for all incoming domestic and international flights given the high potential to inform tourists while they are a captive and receptive audience en route to Phuket.
- The development of swimming programs which support ocean swimming skills and awareness are recommended.
- Promote individual responsibility regarding surfboard rentals for both surf tourism entrepreneurs and tourists alike.
- Surf instruction with a safety-first approach is recommended, including surf lessons and coaching, should be carried out safely. The use of soft surfboards and the development of professional instructor training are recommended.

Rebranding the monsoon is recommended

As a definitive recommendation, this thesis proposes rebranding the ‘monsoon season’ as the ‘surf season’. Given surfing’s popularity and global appeal, branding this period as a ‘surf season’ promotes a favorable image. Furthermore, acknowledging that indeed there is surf on the Andaman Coast during this period is integral to the tourism industry. If done at the national level, through the tourism authority, the message will reach the travel providers which sell Thailand and end any debate regarding disclosure and associated liabilities regarding the inherent risks associated with the surf and ocean conditions associated with the monsoon season. In this way, rebranding the surf season an appropriate and cautionary message to tourists and carries a positive image for the tourism industry at large.

4.4 Contribution of the Study

This study, and the publications produced by the researcher, represents the first research on surf tourism in Thailand. This thesis offers a pathway to further research and provides a new understanding of surf tourism in Thailand and the world. The contribution can be weighed in two contexts, domestic and global.

Contribution to the Kingdom of Thailand

This study contributes to greater Thailand through the assessment of natural surfing resources on the Andaman littoral; it broadens the understanding of coastal resources

and tourism development, and fuels the discussion on sustainability and conservation. Thus this research contributes to the current coastal conservation schema put in place after the 2004 Indian Ocean tsunami. Previous to this research there was no argument for the recognition or conservation of surfing resources in Thailand.

- The literature review on surfing in Thailand is the most complete assembly to date.
- This study contributes to the coastal and tourism planning of Thailand as it identifies the relevance and value of surf tourism in Thailand.
- This study has made-ready the inventory of Andaman surfing resources as data (longitude and latitude) of surf break location which can be incorporated into existing GIS (Global Information System) framework.

Contribution to surf tourism as a global field of study

- This research contributes to the global knowledge of surf tourism, wherein Thailand represents the case study of a unique and non-prolific surf tourism destination.
- This research helps to broaden the field as a study on a non-prolific surfing area.

Definitive contribution

As aforementioned in the concluding thoughts of this research, the study benefits Thailand by identifying and validating a renewable coastal resource which spawns economic activity. In recent years, and ushered by the events of the 2004 Indian Ocean tsunami, the Thai government, and indeed organizations from around the world, have mobilized to document, monitor, and conserve Thailand's coastal resources, yet natural surfing resources have yet to be represented in the conservation design. Therein, this research aids the Thai government and administrative bodies by providing a missing link to the current trend toward integrated coastal resource management, coastal mapping, and coastal GIS documentation. Thus this study initiates a dialogue; it commences to fill the gap in awareness so that individuals and society can adopt an avant-garde approach toward recognizing and appreciating coastal surfing resources.

4.5 Limitations of the Study

This study is by no means a complete account, due in part to the presence and locations of many islands and logistics in exploring them during the monsoon season; an extensive budget would be required for a *full* coastal survey. Limitations take account of the breadth of the study, indicating that this field of study is not solely focused on tourism:

- Limitation of social science data: the study was limited to the physical environment and incorporated minimal social science information.
- Social science limitations: the researcher does not speak Thai; interviewees comprised only a limited number of the total Thai surfers who could speak English.
- Scientific limitations: the research was unable to conduct a definitive study on water quality.
- Limitation of scope and area: the study gave priority to the Andaman Coast and this thesis offered only a brief account of the surfing resources found on the Gulf of Thailand.
- Geographic limitations: including time and space relative to Thailand's continental coastline; the exploration of islands, which indeed possess a high potential for surfing areas is highly problematic given the unpredictability of weather conditions during the monsoon season.
- Logistical and institutional limitations: fishermen are reluctant to venture out to sea and marine park areas may be closed to the public during the monsoon season.
- Financial limitations: as financial resources for this research were somewhat limited, a scientific analysis of water quality during periods of high surf, when waters are highly turbid, was unable to be conducted.
- Aerial survey was not conducted due to financial constraints.
- Social and political limitations: unrest in Thailand's southern provinces poses additional considerations and limitations.
- Tourism businesses that could support the surf tourism sector were not directly included in this study.

4.6 Suggestions for Future Research

Future research should springboard off the current study by expanding the knowledge and methodology found in this thesis. Suggestions for future research include:

- The current research should expand and continue; i.e. sustained coastal survey of surfing areas, including scientific research on physical processes.
- Documentation of surfing areas with Global Positioning Systems (GPS) and integration into existing Geographic Information Systems (GIS) data bases kept by various Thai and international conservation organizations.
- Continued exploratory research should be carried out by land, sea and air. Aerial survey by small plane or helicopter would be especially expeditious.
- Comprehensive exploratory research is required for the southern provinces of Krabi, Trang, and Satun.
- Valuation studies, such as those identified in the surf tourism research literature review, such as research into the market value and non-market value of surfing in Thailand.
- Research which monitors daily wave heights at various locations is suggested to obtain better data on oceanographic swell activity in the region.
- Future research of the social element (i.e. the social argument) through social science methods.
- Research is suggested on the socioeconomic impacts of Phuket surfing contests.
- Further research should be carried out in the context of identifying Thailand's *surfing capital*.
- Research into the causes and prevention of surf-related drowning, including the documentation of drowning statistics.
- Research into the potential effects of regional Artificial Reef (AR) projects.

- Research into the potential to develop Artificial Surfing Reef (ASR) projects.
- Research into internal waves in the Andaman Sea and their affect on coastal currents (if any).
- As Phuket serves as a gateway to the Mergui Archipelago of Myanmar for dive tourism, exploratory research is suggested for the region.

Future research on the Gulf of Thailand

- Future research to identify and assess the natural surfing resources along the Gulf of Thailand's 1,874 kilometer coast is suggested (see Appendix A).
- Future research is suggested for a complete site-specific research approach.
- Future research is suggested to employ a similar methodology to that found herein, including exploratory research of surfing areas, water pollution, and water safety.

Future research on water pollution and marine debris

- Water quality testing should be carried out at surfing areas during the southwest monsoon.
- Reefs and other marine life at surfing areas should be monitored and tested to ensure the integrity and conservation of surfing areas.
- This is especially urgent for the Kalim reef at Patong and the Nai Yang reef in the Sirinat National Park in Phuket.
- Cape Pakarang and the associated cluster of surfing areas in Khao Lak should be tested and monitored.

Future research on water safety

- Further research should be carried out on water safety, including the physical factors behind the high drowning rate in Phuket.
- Social science research should be carried out on the particularities and profiles of drowning in order to better understand the related issues.

- Individual water safety assessments should be carried out for each of the surf beaches of the Andaman Coast.

Future research on climate change

Global climate change and a resulting rise in sea level are expected to have a strong impact on Thailand's coastal areas (World Bank, 2006), and research into the effects of climate change in the context of surf tourism has hardly been addressed. Current literature on storm activity in the Bay of Bengal and the Andaman Sea may offer insight relatable to surfing in Thailand, including the expectation for a decreased in the amount of cyclonic activity overall (fewer storms), in contrast with larger, more destructive storms occurring in the region (Singh, 2000). Given the considerable implications of climate change on natural surfing resources, future research on the effects of climate change on surf tourism is suggested.

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APPENDICES

Listed in order of appearance

APPENDIX A

Surf Generating Weather Systems in the Gulf of Thailand

APPENDIX B

Annotated Chronology of the Surfing Thailand Literature

APPENDIX C

Online Resources for Surfing in Thailand

APPENDIX D

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APPENDIX E

Surf Tourism Questionnaire

APPENDIX F

Types of Surfing Waves on the Andaman Coast

APPENDIX G

Maritime Tin Mining, Andaman Coast, Thailand

APPENDIX H

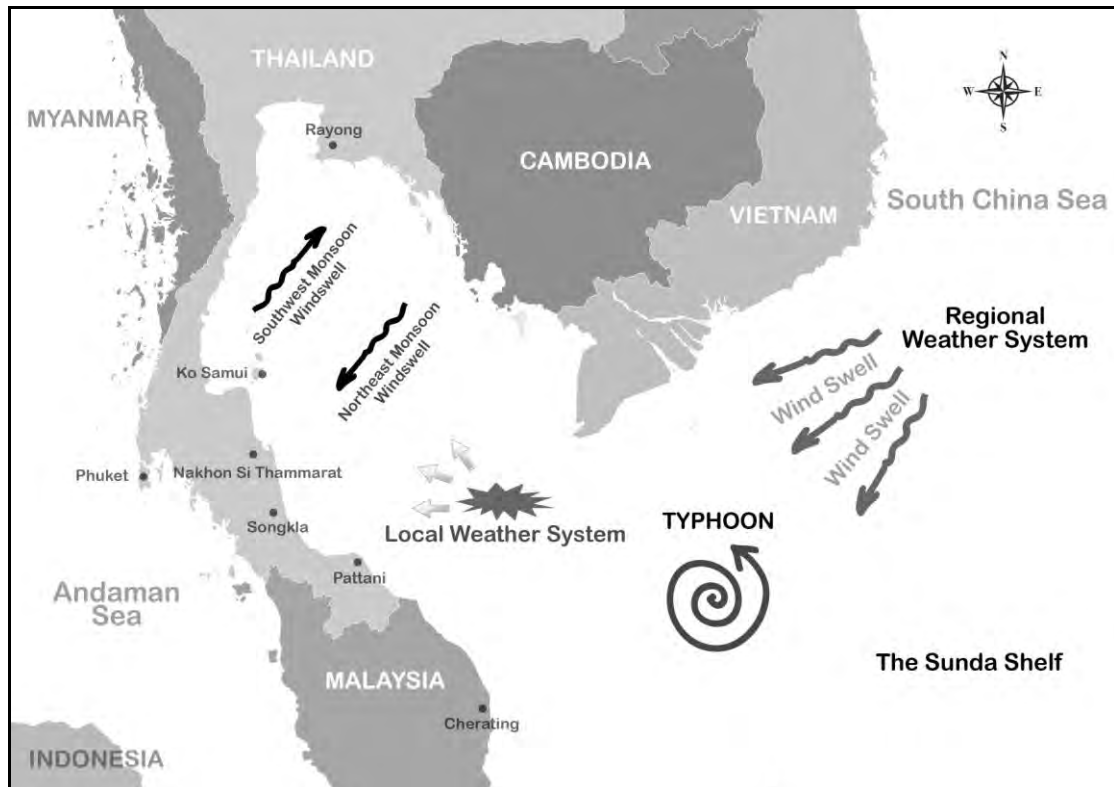
Andaman Marine Debris: Plastic Bags in the Surf

APPENDIX I

Wave Types Germane to Ocean Safety in Phuket

APPENDIX A

Surf Generating Weather Systems in the Gulf of Thailand



Source: Author

Exploratory research by the author indicated that the Andaman Sea, as contiguous with the Indian Ocean, and its associated wave activity possessed the largest and most consistent surf. However, the Gulf of Thailand is relevant to the discussion on surfing in Thailand, and 31 surf sites were identified (see Figure 3.1) and four types of surf generating weather systems in the Gulf of Thailand are illustrated (above) and identified as follows:

- Wind swells generated by the southwest monsoon which arrives on Gulf coast provinces including Rayong.
- Northeast monsoon windswells which arrive on Gulf coast provinces of Surrathanni (including Ko Samui), Nahkonsithammarat, Songkla, Pattani, and Narathiwat.
- Low pressure systems which generate easterly swells and may approach Surrathanni (including Ko Samui), Nahkonsithammarat, Songkla, Pattani, and Narathiwat from the east and southeast.
- Typhoons which enter the Gulf of Thailand from the east.

APPENDIX B

Annotated Chronology of the Surfing Thailand Literature

Date/Source	Title/Author	Synopsis
1991 Proposal draft submitted to the TAT	<i>Surfing in Thailand</i> By Laurie Thompson	Australian surfer and water sports retailer Laurie Thompson's 35 page English/Thai draft proposal (submitted to the TAT office in Phuket) for the exploration and evaluation the surfing potential of Thailand as a means to "open up areas for surfboard riding in Thailand" as a new tourist resource.
2003 The Encyclopedia of Surfing	<i>Thailand</i> By Matt Warshaw	Acknowledges that surfing in Thailand began as early as 1980 by American and Australian surfers, and that 2000 witnessed the inaugural Phuket/Quiksilver Surfing Contest. In 2003 Warshaw estimates that there were some 300 native Thai surfers as well as at least one surf school and one surfboard rental business.
2003 Andaman Post	<i>Phuket Boardriders, a Club of Convenience</i>	Several page article on the Phuket Boardriders Club identifying farangs (foreigners) for their generosity in nurturing a new generation of Thai surfers. The article identifies that there were 90 club members in 2003.
2006 Boarding	<i>Surf Rider</i>	Thai language magazine with several pages identifying what surfing is and what kind of gear is needed. One page mentions Phuket and the names of several expatriates who were among the earliest to surf Phuket on a regular basis.
2006 April MARS	<i>Soul Surfer</i> By Worachai Rattanaduangta	Thai lifestyle magazine (based in Bangkok) with 12 pages (in Thai) on surfing in Phuket, including some of the early history of the sport alongside current events including the surf contests. Perhaps the first informative article to illustrate Phuket surfing history.
2007 October Window on Lifestyle Published by Image Asia	<i>Fighting the Wave</i> (no author credited) Online: windowonlifestyle.com/features_shopping/surfboard.htm	This free magazine offered several pages on surfing and a short shopping guide, claiming that, "Many surf lovers come to Phuket each year to play in the azure sea," and gives short profiles for and perspectives from 3 surfers in Phuket: Thai, Japanese and Australian.
2007 September On the Board No.062	<i>Surf in Thailand</i> By Mio Kawazoe	Brings to life the adventure and experience available to Japanese surfers in Thailand.
2008 Research paper Prince of Songkla University	<i>Beach & Coastal Survey: What Future for Surf Tourism in Thailand</i> by Martin and Assenov	As the first ever peer-reviewed research on surfing in Thailand, this study is focused on identifying surf tourist activity at Kata Beach and conducted an independent coastal survey to discover and assess Thailand's surf resources as the foundation for further research.
2008 Lonely Planet	<i>Thailand's Islands & Beaches</i> By Burke and Bush	The 2008 Lonely Planet edition offers several paragraphs on surfing in Thailand and mentions there are a few surf shops and that "Phuket's west coast beaches get a good pounding" during the monsoon season.
2008 March Tourism Authority of Thailand (TAT) Booklet	<i>Surfing in Phuket</i>	Colorful 26 page tourism promotion booklet published by the Tourism Authority of Thailand (TAT) acknowledging that the surfing craze recently hit Thailand "With a punch."

Annotated Chronology of the Surfing Thailand Literature (continued)

Date/Source	Title/Author	Synopsis
2008 March Transworld Surf Magazine California, USA	<i>All is Possible, My Friend: off the beaten (surf) path in Thailand</i> By Michael Kew	In line with the known new age style of Transworld Surf Magazine, their story brings out oddities of the Thai surf experience, like monsoon rains, stormy seas, tsunami warnings and prostitution. This article begins with the word „transexual“ and ends with „in Thailand, all is possible, my friend.“
2008 March 22-28 Phuket Gazette	<i>Savvy surfer crafts slickest boards</i> By Skyler Swezy	2 page story on Australian Keith „Robbo“ Robinson and his surfboards which are hand-made in Thailand (Indian Pacific Surf) for the Phuket surfers, especially the Kamala Surf Club.
2008 September Nalu Magazine	<i>Andaman Sea Wave Ride Island</i> By Ricu Emoto	Japanese surf lifestyle magazine article based on two Phuket surfers — Kata Beach local Jumnon Tongooni and Hawaii surfer and Phuket resident Steven Martin.
2008 The Greater Phuket Magazine Vol.17 No.3	<i>“Catching the Wave”</i> By David Gow	6 page article on surfing in Phuket which brings to light the increasing popularity of the sport. It mentions that many tourists arriving in Phuket are unaware of the surf. It suggests that novices take surf lessons and warns of “unbelievably strong currents.”
2008 The Greater Phuket Magazine Vol.17 No.6	<i>“Extreme Sports”</i> by Logan Hesse	4 page article promoting adventure tourism along the Andaman coast. Includes one page on how/where to take a surf lesson in Phuket.
2009 The Greater Phuket Magazine Vol.20 No.4 ArtAsia Press	<i>Extreme Phuket</i> Photos by Jirat Sarmkast <i>Have a Jabu Day</i> by Scott Murray	First-ever cover shot of surfing in Thailand to appear on published magazine. Featuring Jake Paterson during the Thailand Surf Series, the article offers no text. A second article appearing in the same edition makes a brief mention of Anissa Flynn’s invitation by Quiksilver to compete in Bali.
2009 The World Stormrider Guide Vol. 3 Low Pressure Ltd.	<i>Phuket</i> Bruce Sutherland, ed.	Marks the first acknowledgment of Thailand as a surfing destination in the globally recognized “Stormrider” book series. Offers the most informative synopsis of surfing in Thailand to date, identifying details on swell types, swell directions, and other conditions.
2009 Research paper Prince of Songkla University	<i>Re-thinking the Monsoon: Sustainable Surf Tourism in Thailand</i> by S. A. Martin	Offers interdisciplinary perspectives on the scope of physical and cultural resources for surf tourism in Thailand alongside identifiable social and environmental issues. This research includes an analysis of marine debris carried ashore during the southwest monsoon.
2010 Thailand Surfrider Magazine	<i>Coastal Resource and Surfing in Thailand</i> By S. A. Martin	Marks the debut of Thailand’s first-ever surf magazine with an article on coastal resource issues surrounding surfing, including beach trash the conservation of sites.
2010 April 10-16 Phuket Gazette	<i>Surf’s up, drownings down, as low season waves roll in</i> By Stephen Fein	Reports on the water safety research by foreign resident surfer Steven Martin whereby interviews of a variety of surfers indicate they regularly assist swimmers in the surf (See Appendix D).

Source: Author

APPENDIX C

Online Resources for Surfing in Thailand

Online Source	Details
Phuket Gazette phuketgazette.net (search the news archives on surfing)	Over the years there have been several dozen mentions on surfing in Thailand in the <i>Gazette</i> , mostly related to the surfing contests. In 2009 the Newspaper took a leading role in reporting on the surfing contests, including on-camera interviews with <i>Quicksilver Inc.</i> representatives Paul Hutson and Jake Patterson which were aired on Phuket Gazette TV.
The Phuket Post phuket-post.com (search news archives on surfing)	The Phuket Post has had articles on the surfing contest in recent years, but not to the extent of the Phuket Gazette. In 2009 they published several articles following the success of Anissa Flynn in the girls division of the Thai Surf Series.
Phuket Boardriders Club phuketboardridersclub.com	Surfing club website with club history, happenings, images, and surf contest news. This site has the club's mission statement and news archives of events, such as professional surfer Bethany Hamilton's visit in support of the 2004 tsunami victims.
Thai Surf Series thaisurfseries.com	Launched by Phuket Boardrider president Chanin Aiyarak in favor of gaining support from the surf clothing giant Quiksilver for all 3 of the Phuket 2009 surfing season (Andaman Coast).
Saltwater Dreaming saltwater-dreaming.com	Privately run web site and small surf shop near Surin Beach Phuket. At time of writing, this site offered the most information and descriptions of surfing areas in Thailand. Web site administrator Rick Gamble offers collective knowledge on specific surf sites including the Gulf of Thailand.
Surflife surflife.com	As of January 2010, a search for "Thailand" on the global media company surflife home page retrieves some 30 relevant press releases or information related to surfing in Thailand. The majority were sent out through the Phuket Boarders club to support the surf events and local surfers.
Surfers Village surfersvillage.com	As of January 2010, a search for "Thailand" on Surfers Village locates a half dozen press releases related to the Quiksilver 2009 surf events and the Thai Surf Series.
Global Surfers globalsurfers.com	As of January 2010, a search for "Thailand" on Global Surfers locates their surf spot guide for Thailand listing ten surf breaks as well as their forum with some 30 entries.
Wanna Surf wannasurf.com/spot/Asia/Thailand/index.html	The Wanna Surf atlas lists and describes 25 surf spots for Thailand and provides a brief introduction to the weather phenomena required to have waves in the Andaman.
Magic Seaweed magicseaweed.com/Phuket-Surf-Report/649/	Provides the surf report and forecast information for Phuket, including detailed seasonal conditions, tide data, and historic records.
Surfing Phuket Blog surfingthailand.blogspot.com/2007/05/surfing-and-travel-thailand.html	Blog containing original and detailed description of surfing in Thailand, including information on the Gulf of Thailand. At the time of writing, this blog was no longer posted. Last accessed in 2008. <i>Marty/Surfingphuket</i> (Posted by Surfingphuket).
Phuket Surfing Contest phuketsurfingcontest.com	Official 2007 and 2008 web site for the annual Phuket Surfing Contest at Kata Beach with the support from surfer Wallop Nadon, president of the Kata-Karon Surf Club.
Pakarang Surf Shop pakarangsurfshop.com	Launched by Oregon surfer Matt Blauer, this site was the first of its kind, promoting the Kho Lak area, namely Laem Pakarang (literally „Cape Coral“).
Phuket Surf phuketsurf.com	Surf rental stand at Kata Beach which offers web site with board rentals and lessons given by local Kata Beach surf crew (the "Kata Krew") and is a haven for many expiates as a place to store their surfboards during the monsoon season.
Phuket.com phuket.com/sports/surfing.htm	The definitive Phuket.com added surfing to their information base in 2007 and brought it up to the mark in 2009.

Source: Author

APPENDIX D

The Phuket Gazette Vol. 17, Issue 15, April 10-16

4 PHUKET GAZETTE

NEWS FEATURE

April 10 - 16, 2010

Surf's up, drownings down

Phuket water safety expert uncovers the island's unsung lifesaving heroes.

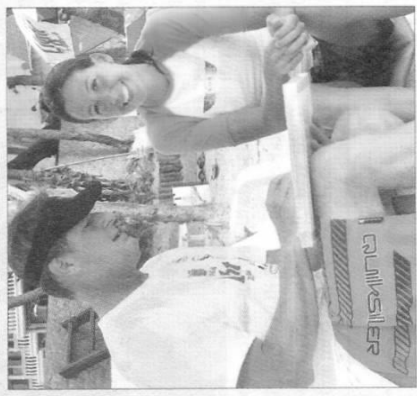
IN RECENT years Phuket beaches have been plagued by drownings, which remain a leading cause of death among tourists, especially those from abroad.

Lifeguard services have been precarious in recent years. Simply put, sometimes there are lifeguards, sometimes not. Throughout the current high season which began last November and which is now drawing to a close, there have been no lifeguards on the island's beaches, although the Phuket Provincial Administration Organization is expected to announce a new service provider by the time this issue is published.

But even with new lifeguards patrolling beaches, it seems inevitable that the death toll will continue to rise until something is done to address the dangerous combination of factors that lead so many foreign tourists into treacherous surf with fatal results.

One man's study

In a recent study conducted by Phuket resident Steven Martin, he



Man on a mission

STEVEN Martin has 30 years of water safety experience, including five years service as County Water Safety Officer in his native Hawaii and 10 years volunteer service with the American Red Cross. Currently in his third year as an instructor at Prince of Songkla University's Phuket campus, the 50-year-old is an avid surfer.



cites unfamiliarity with local beaches, poor swimming skills, language barriers and the disorientation of being in a foreign environment as part of the deadly equation – one made even worse when tourists enter the surf after consuming alcohol.

Several physical factors make Phuket's west coast beaches more dangerous than they may appear to the layman during the monsoon season that runs from May to October, said Mr Martin.

Monsoon season surf in Phuket is characterized by a wave phenomenon known as "short-period swell", which means that waves arrive relatively close together and propagate proportionately strong currents – including rip tides – even if the waves themselves don't appear particularly large or dangerous.

Short-period swells allow swimmers and surfers very little time to recover between waves. For example, a swell period of six

seconds implies that a wave will crash on the shoreline – or on surfers and swimmers in the surf zone – every six seconds on average. The effect on a swimmer in trouble is akin to that of a boxer who goes down not from a single knockout punch, but from a relentless barrage of steady blows.

Adding further to the danger are strong prevailing winds during the monsoon season that can produce “choppy” conditions at the surface that inhibit visibility and disorientate swimmers who might already be panicking.

Few people on the island have more first-hand knowledge of the dangers than veteran Phuket lifeguard Somkhit Kuer-nun, who has worked for years as a member of the provincial lifeguard service. Lifeguard services put in place after the tsunami have cut down the number of drowning deaths, but only by about one quarter annually, he estimates.

“Before the tsunami, there were an average of 12-16 surf-related drownings per year, but for the last five years, with intermittent periods of having lifeguards on beaches, the average was 9-12 per year [prior to 2009 low season]. Most drownings during the surf season are surf-related, while drownings in the high season are usually alcohol related,” he said.

Interviews with surfers

After rescuing several swimmers in need of help, Mr Martin decided to study how widespread the phenomenon was by asking fellow surfers if they had ever aided swimmers in distress.

He conducted 167 interviews with surfers in Phuket from May 2007 to January 2010. These included 48 local residents, both Thai and foreign, who surf regularly during the Andaman surfing season and had at least one personal experience in an ocean rescue situation.

He also interviewed 119 surf tourists from countries including Australia, the US, Singapore, Japan and South Africa. Most of these were interviewed randomly and spontaneously, while surfing.

These interviews revealed that surfers in both groups reported having rescued swimmers, both Thais and foreigners, with the resident surfers reporting a higher numbers of such incidents.

“The vast majority of surfers who responded to calls for help were already in the water when they saw or heard the person in trouble in the surf line. Nearly all the surfers were able to describe the chain of events surrounding each rescue in some detail and were therefore

included in the study,” he wrote. Of the 48 Thai and foreign resident surfers interviewed, 23 reported making at least two rescues per year over the three-year period from 2007 to 2009.

“This more or less coincides with my personal experience of eight rescues during the three-year study period. Therefore, with 23 surfers having rescued an average of two people per year, the study identifies an average of 46 rescues per year. Multiplied by three, this amounts to 138 rescues during the study period.”

Helping the cause

Mr Martin also recorded second-hand reports by other surfers of 53 additional rescues made by Thai and foreign resident surfers over the same period along Thailand’s Andaman coastline.

“For example, there was a report of a group of four European tourists swept off the beach near Khao Lak who were rescued by foreign resident surfer Matt Blauer,” he wrote.

Mr Blauer, a fellow American from Oregon state, opened the first surf shop in Khao Lak and kept Mr Martin apprised of rescue reports from Phang Nga province.

“Totalling the aforementioned 138 rescues and the 53 random rescues for the same

period, and including the eight rescue-assists made by the author, this study documents 199 rescues performed [by resident surfers] from 2007-2009,” wrote Mr Martin.

Staggering results

In a second study group, 119 surf tourists were asked about their experiences in water safety while in Phuket. Of these, 22 said they had rescued a swimmer once during their vacation in Phuket. Another four reported having rescued at least two swimmers. One surfer said he had saved a family of three in a single incident.

“This shows that 27 of the 119 surf tourists interviewed, over 20 percent, made rescues, totaling 33 swimmers from 2007-2009,” he wrote.

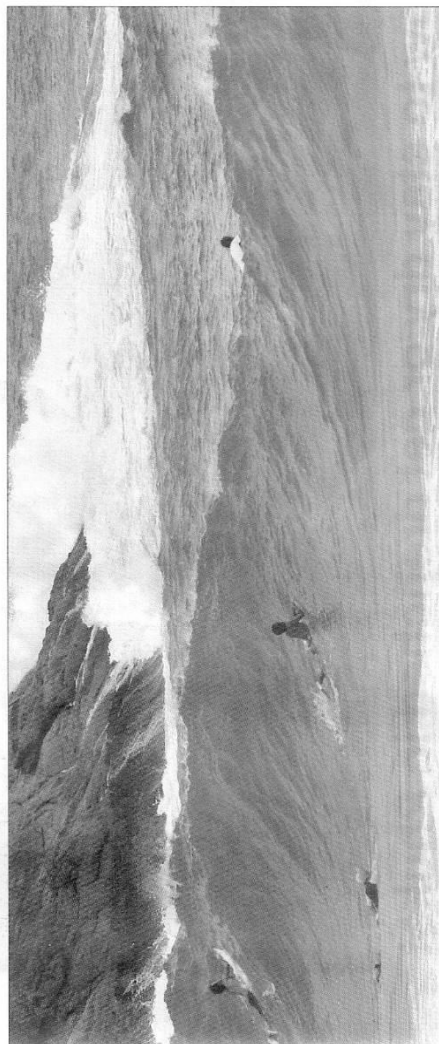
Most surfers did not ask the people they helped where they were from, but recalled they were often Europeans. This matched Mr Martin’s experience.

“Of the eight rescues I made, all were male tourists: four German, two Russian, one Swiss and one Japanese,” Mr Martin said.

“Surfers are inevitably surf lifesavers as they are in the surf line and are often the first to encounter tourists in dire need of assistance. My research documented 232 rescues by surfers over the past three years.”

as low season waves roll in

Gazette News Editor Stephen Fein reports.



Emergency numbers

Police: 191

Tourist Police: 1155

Vachira Phuket Hospital:
076-361-234

Mission Hospital Phuket:
076-237-220/6

lifeguards at a professional level. If we want specialist behavior it will come at a specialized price.... Once professional lifeguards are in place, statistics need to be kept regarding 'who, how, what, where, when and why' rescues take place, alongside related wind, wave, and weather data. This is already standard operating procedure in California, Hawaii, and Australia," he said.

Local authorities should also provide videos for passengers aboard inbound flights during the monsoon season warning them of the risks. A similar strategy already in place for Hawaii is a proven success, he said.

Mr Martin called for further mobilization of Phuket's growing number of resident surfers to assist in the beach safety effort. The number of surfers has increased to about 250 from just 30 a decade ago, he said.

Actual figures are likely far higher, he added.

Mr Martin recommended a number of ways to reduce the death toll. These included increasing salaries to attract more professional lifeguards and bringing in more trainers and mentors from places noted for a more serious approach to beach safety.

"The government will need to allocate an appropriate budget in order to train and pay

What needs to be done

In his conclusion he asks rhetorically: "As the tourism industry pushes to annualize the tourist season - and draw tourists during the monsoon season - the issue of drowning and water safety will inflate. By offering the Thai surfers a chance for a good salary and meaningful profession, and by bringing in globally recognized professionals to train and inspire them, the current negative image can be wholly reversed and confidence to promote tourism in monsoon season restored. In a global context, waves and surfing are a powerfully positive image. Why not turn the negative into a positive by rebranding the 'monsoon season' as 'surf season', with Phuket beaches guarded by a new class of Thai water safety men and women?"

The Phuket Gazette

- Since 1994 -

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Fax: 076-615240
Email: info@phuketgazette.net

Catching the safety wave

A key reason for Phuket's success as a tourist destination is the wide variety of leisure activities available: sailing, golf, bowling, cricket, volleyball, windsurfing, jet-skiing, parasailing, shooting pool, throwing darts – name a pastime and you're likely to be able to enjoy it here.

This week's *Gazette* news feature (*see pages 4-5*) sheds some light on a newer recreational activity gaining in popularity in Phuket: surfing.

There are now an estimated 250 regular surfers on the island, up almost tenfold from a decade ago. The sport has grown to the point that Phuket now plays host to annual surf competitions with international sponsorship and has a well-established association, the Phuket Boardriders Club, to promote surfing in Thailand.

While rival destinations like Bali, Hawaii and Australia's Gold Coast will no doubt continue to attract the bulk of hardcore "surf tourists", Phuket's west coast beaches offer good enough waves and amenities to keep the island on the map as a surf destination, especially given the low cost of accommodation during the monsoon season.

The fortuitous presence of surfers along Phuket's west coast beaches goes well beyond tourism revenue generation, however. As pointed out in this week's feature, surfers have played a key role in beach safety by helping swimmers in distress back to the safety of the shore. In at least one case, an entire family swept out to sea was saved this way.

A study by Phuket-based American researcher Steven A Martin documents 232 rescues of swimmers by surfers over the three-year period from 2007 to 2009. The actual figure is, of course, probably far higher.

This comes as a rare dose of good news for beach safety in monsoon-season Phuket, where scores of overconfident swimmers – mostly foreign tourists from Europe – have perished in recent years.

Apart from mobilizing surfers, another good suggestion made by Mr Martin is to inform inbound tourists of the dangers they face if they ignore the red warning flags and enter the surf.

In Hawaii this has been successfully accomplished by playing warning videos on all inbound flights. Such an approach, suggested several times in this space in the past, makes a great deal of sense; airplane passengers comprise not only a 'captive audience,' but one that tends to be highly receptive to safety-related announcements.

The Civilian Aviation Department and provincial government should take immediate steps to put such a system in place before the monsoon season begins – and the death toll resumes its climb.

– The Editor

APPENDIX E

Surf Tourism Questionnaire

THAI BEACH & SURF TOURISM SURVEY 2008	
<p>Dear Visitors! We are conducting research on surfing in Phuket. This study is conducted by <u>international students</u> with the <i>Hospitality and Tourism Management</i> program at <i>Prince of Songkla University</i>, Phuket Campus, Thailand. We highly appreciate your cooperation! The information you supply is confidential and will be used for academic purposes and the collective data will be beneficial for the future and sustainability of surfing in Phuket. Your comments are really important and greatly appreciated!</p> <p>Thank you for sharing and helping with our study!</p>	
Date:	<input style="width: 100px;" type="text"/> 2008
PERSONAL & VISITOR PROFILE	
1)	a). What is your Nationality? _____ b). In which country do you normally live? Country _____ c). City _____
2)	a). What is your occupation? _____ b). Are you a student (if so, where)? _____
3)	What is the level of your education? a). High School <input type="checkbox"/> b). College <input type="checkbox"/> c). Mater Degree <input type="checkbox"/> d). Doctor Degree <input type="checkbox"/>
4)	Gender: Male <input type="checkbox"/> Female <input type="checkbox"/>
5)	In which of the following <u>age</u> categories do you belong? a). below 20 <input type="checkbox"/> b). 20-29 <input type="checkbox"/> c). 30-39 <input type="checkbox"/> d). 40-49 <input type="checkbox"/> e). 50 & above <input type="checkbox"/>
6)	What is the <u>main purpose</u> of your visit to Phuket? a). Holidays/Vacation/Leisure <input type="checkbox"/> b). Business <input type="checkbox"/> c). Visiting Friends & Relatives <input type="checkbox"/> d). Other <input type="checkbox"/>
7)	a). How many days are you staying in <u>Phuket</u> ? _____ b). How many days in <u>total</u> are you staying in <u>Thailand</u> ? _____
8)	Where are you staying in Phuket? a). Luxury Hotel [4 - 5 star].. <input type="checkbox"/> b). Hotel [2 - 3 star]..... <input type="checkbox"/> c). Budget/Guest House..... <input type="checkbox"/> d). Private Home..... <input type="checkbox"/> e). What beach are you staying at? _____
9)	With whom are you travelling on this trip? a). Alone <input type="checkbox"/> c). With relations & or friends <input type="checkbox"/> b). With Partner <input type="checkbox"/> d). Other (please specify) <input type="checkbox"/>
10)	When did you decide (or plan) to come to Thailand? a). 1 week before <input type="checkbox"/> d). 4 weeks before <input type="checkbox"/> g). 3 months before <input type="checkbox"/> b). 2 weeks before <input type="checkbox"/> e). 6 weeks before <input type="checkbox"/> h). 6 months before <input type="checkbox"/> c). 3 weeks before <input type="checkbox"/> f). 8 weeks before <input type="checkbox"/> i). 1 year or more <input type="checkbox"/>
11)	How did you make your travel arrangements? a). Internet <input type="checkbox"/> b). Travel Agent <input type="checkbox"/> c). Other: _____
SURFER PROFILE	
12)	How many years have you been surfing? a). First Time <input type="checkbox"/> b). 1 year or less <input type="checkbox"/> c). 1-2 years <input type="checkbox"/> d). 2-4 years <input type="checkbox"/> e). 5+ years <input type="checkbox"/>
13)	Please rate your surfing ability: a). Beginner <input type="checkbox"/> b). Intermediate <input type="checkbox"/> c). Advanced <input type="checkbox"/> d). Highly Advanced <input type="checkbox"/>
14)	Are you renting a board or did you bring your own board from home? Renting <input type="checkbox"/> Traveling with Board(s) <input type="checkbox"/>
15)	How many surfboards do you <u>own in total (including at home)</u> ? 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4+ <input type="checkbox"/>
16)	a). Have you travelled anywhere in the last 3 years for Surfing? Yes <input type="checkbox"/> No <input type="checkbox"/> b). If Yes, would you please <u>list the countries in the order</u> that you visited (beginning with the most recent): 1). _____ 2). _____ 3). _____ 4). _____ 5). _____
17)	Did you know there was surfing in Phuket before you came? Yes <input type="checkbox"/> No <input type="checkbox"/>
18)	a). Had you planned on surfing in Phuket before you arrived? Yes <input type="checkbox"/> No <input type="checkbox"/> b). Was surfing <u>one of the reasons</u> that you came to Phuket? Yes <input type="checkbox"/> No <input type="checkbox"/> c). Can surfing be considered as a <u>main purpose</u> of visiting Phuket? Yes <input type="checkbox"/> No <input type="checkbox"/> d). Please share any <u>comments</u> about your surfing plans: _____

Surf Tourism Questionnaire (Continued)

<p>19) How did you know that there was surfing in Phuket? i). Please <u>comment</u>: _____ _____</p>	<table style="width: 100%;"> <tr> <td style="width: 50%;">a). Internet <input type="checkbox"/></td> <td style="width: 50%;">e). Television/Radio <input type="checkbox"/></td> </tr> <tr> <td>b). Magazines <input type="checkbox"/></td> <td>f). Friends/Relatives <input type="checkbox"/></td> </tr> <tr> <td>c). Travel Guide Books <input type="checkbox"/></td> <td>g). Previous Experience <input type="checkbox"/></td> </tr> <tr> <td>d). Travel Agents <input type="checkbox"/></td> <td>h). Had no knowledge <input type="checkbox"/></td> </tr> </table>	a). Internet <input type="checkbox"/>	e). Television/Radio <input type="checkbox"/>	b). Magazines <input type="checkbox"/>	f). Friends/Relatives <input type="checkbox"/>	c). Travel Guide Books <input type="checkbox"/>	g). Previous Experience <input type="checkbox"/>	d). Travel Agents <input type="checkbox"/>	h). Had no knowledge <input type="checkbox"/>
a). Internet <input type="checkbox"/>	e). Television/Radio <input type="checkbox"/>								
b). Magazines <input type="checkbox"/>	f). Friends/Relatives <input type="checkbox"/>								
c). Travel Guide Books <input type="checkbox"/>	g). Previous Experience <input type="checkbox"/>								
d). Travel Agents <input type="checkbox"/>	h). Had no knowledge <input type="checkbox"/>								
<p>20) a). Did you take a surf lesson while in Phuket? Yes <input type="checkbox"/> No <input type="checkbox"/> b). Have you ever taken a surf lesson before? Yes <input type="checkbox"/> No <input type="checkbox"/></p>	<p>c). If yes, when and where? _____ _____</p>								
<p>21) a). Have you heard about other surfing areas or beaches for <u>surfing in Phuket</u>? Yes <input type="checkbox"/> No <input type="checkbox"/> b). If Yes, what are the surfing areas or beaches you heard of: _____ c). If Yes, did you surf any of these beaches? <u>Please name</u>: _____</p>									
<p>22) a). Have you heard about any surfing areas or beaches in Thailand <u>other than Phuket</u>? Yes <input type="checkbox"/> No <input type="checkbox"/> b). If yes, please name any surfing areas or beaches which you know of or have heard of <u>other than Phuket</u>: _____ _____</p>									
<p>23) How do you rate <u>your personal</u> surfing experience in Phuket? 1). Beyond Expectations <input type="checkbox"/> 2). Good <input type="checkbox"/> 3). Satisfactory <input type="checkbox"/> 4). Unsatisfactory <input type="checkbox"/></p>									
<p>24) Overall, how do you rate the Phuket <u>surfing conditions</u>? 1). Beyond Expectations <input type="checkbox"/> 2). Good <input type="checkbox"/> 3). Satisfactory <input type="checkbox"/> 4). Unsatisfactory <input type="checkbox"/></p>									
<p>25) a). How would you rate the <u>surf safety</u> at the beach? 1). Safe <input type="checkbox"/> 2). Some Issues <input type="checkbox"/> 3). Not Safe <input type="checkbox"/> b). Please comment or share your opinion about <u>ocean safety</u> at <u>Phuket beaches</u>: _____ _____</p>									
<p>26) a). When Surfing, how would you rate the <u>ocean water quality</u> at the beach in Phuket? 1). Very Clean <input type="checkbox"/> 2). Clean <input type="checkbox"/> 3). Fair <input type="checkbox"/> 4). Not Clean <input type="checkbox"/> b). Was there trash or debris in the water or in the surfing area? c). If yes, where do you think it comes from? _____</p>									
<p>27) a). Do you feel that the <u>information about Surfing</u> in Thailand is satisfactory? Yes <input type="checkbox"/> Maybe <input type="checkbox"/> No <input type="checkbox"/> b). Please add a comment or opinion: _____</p>									
<p>28) a). Would you recommend surfing in Thailand to your friends? Yes <input type="checkbox"/> Maybe <input type="checkbox"/> No <input type="checkbox"/> b). Would you be interested to visit other surfing areas in Thailand in the future? Yes <input type="checkbox"/> Maybe <input type="checkbox"/> No <input type="checkbox"/> c). Would you be interested to read more about Surfing Thailand? Yes <input type="checkbox"/> Maybe <input type="checkbox"/> No <input type="checkbox"/></p>									
<p>29) Please share any comments or opinions about surfing or surf tourism in Phuket or Thailand: _____ _____ _____</p>									
<p>30) Please share any suggestions for the <u>future</u> of surfing or surf tourism in Phuket or Thailand: _____ _____ _____</p>									
<p>Please contact us and share your thoughts or comments: surfingthailand@gmail.com</p>									
<p>THANK YOU VERY MUCH FOR YOUR HELP!</p>									

Source: Author

APPENDIX F

Types of Surfing Waves on Thailand's Andaman Coast

Southwest Monsoon Wind Swell, Kata Beach



Source: Author (2008)

Indian Ocean Groundswell, Kata Noi Beach



Source: Author (2008)

Regional/Andaman Swell, Kalim Beach



Source: Author (2008)

APPENDIX G

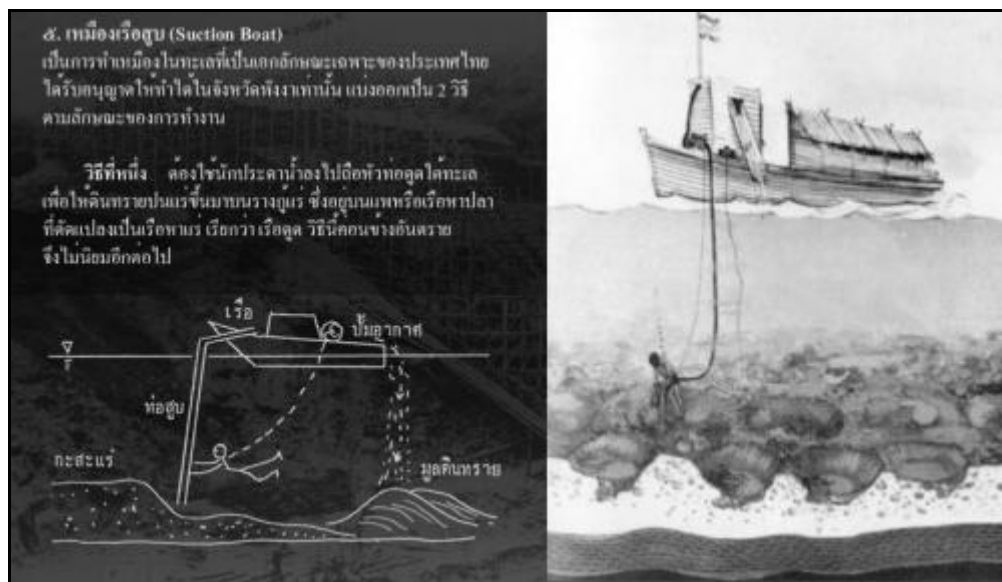
Maritime Tin Mining, Andaman Coast, Thailand

Bucket Dredge Operating on the Andaman Coast



Source: Phuketdata.net [digital gallery]

Driver-guided Suction Boat Operating on the Andaman Coast



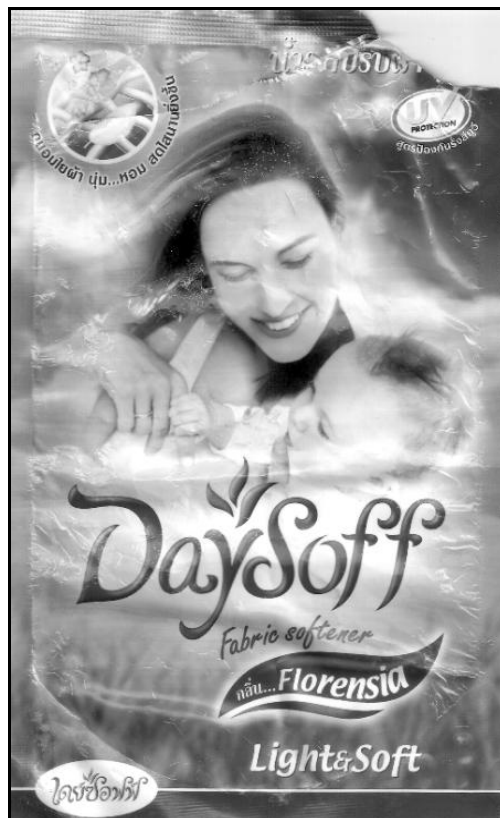
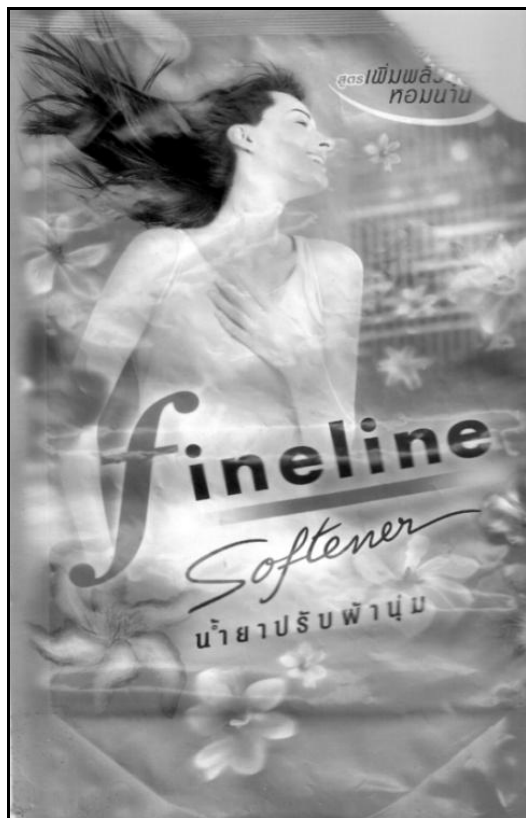
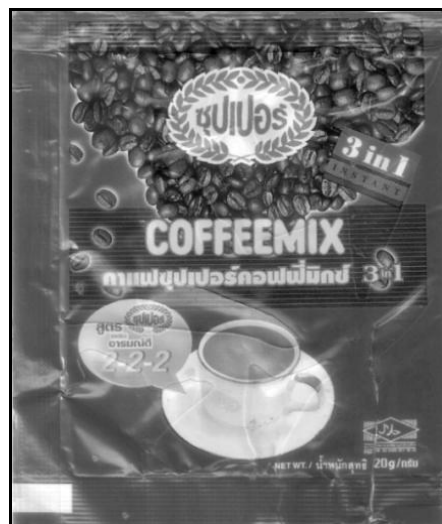
Source: Phuketdata.net [digital gallery]

APPENDIX H

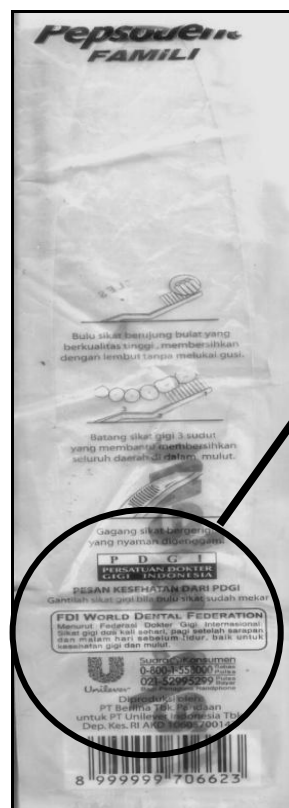
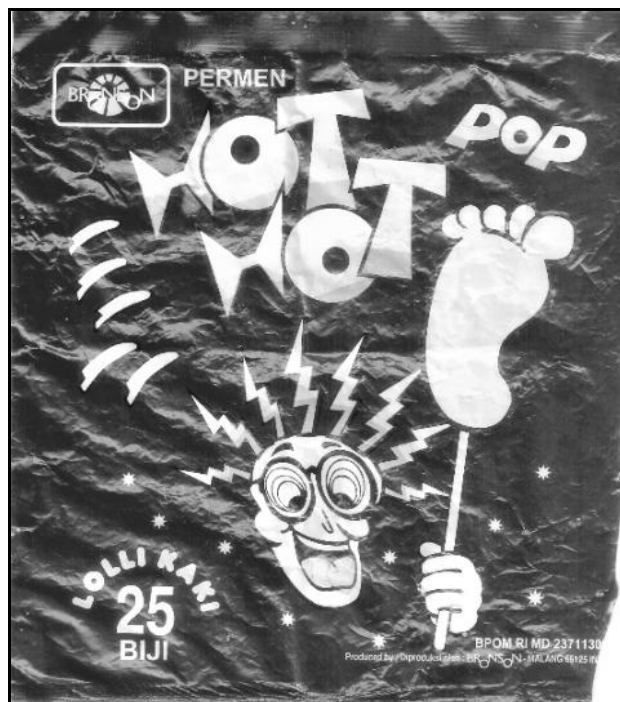
Andaman Marine Debris: Plastic Bags in the Surf

The following samples were taken from the waters along Thailand's Andaman Coast:

Marine Debris with Thai Labeling



Marine Debris with [Bahasa] Indonesian Labeling



Marine Debris with Burmese Labeling



Marine Debris with Hindi Labeling



APPENDIX I

Wave Types Germane to Ocean Safety in Phuket

Spilling Breakers at Kata Beach, Phuket



Source: Author (2008)

Plunging Breaker at Kata Noi Beach, Phuket



Source: Author (2010)

Surging Breaker at Mai Kao Beach, Phuket



Source: Author (2007)

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List of Related Publications and Proceedings

- Martin, S. A. (2010b). The Surfer-Lifesavers of Phuket. *Thailand Surfrider*. (3) 40-42. Thalang, Phuket: Purple Diamond Ltd.
- Martin, S. A. (2010a). Coastal Resource and Surfing in Thailand. *Thailand Surfrider*. (1) 42-50. Thalang, Phuket: Purple Diamond Ltd.
- Martin, S. A. (2009). Rethinking the monsoon: Sustainable surf tourism in Thailand. Proceedings of the *International Tourism Conference on Sustainable Hospitality and Tourism Management: Beyond the Global recession*. May 14-15. Silpakon University. Bangkok, Thailand.
- Martin, S. A., & Assenov, I. (2008). Beach and coastal survey: What future for surf tourism. Proceedings of the 7th Asia Pacific Forum for Graduate Students' Research in Tourism. Selangor, Malaysia, June 3-5, 2008.

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