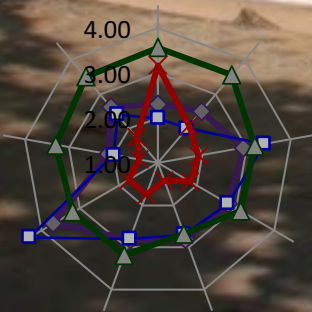


# A Surf Resource Sustainability Index for Surf Site Conservation and Tourism Management



*PhD Thesis Defense*  
*Friday, April 26, 2013*  
*9:00-12:00*  
*Room E401*  
*Prince of Songkla University*  
*Hat Yai, Thailand*



 **SRSI**

**Steven Andrew Martin**  
**MA, MBA, PhD Candidate**  
**Faculty of Environmental Management**  
**Prince of Songkla University**  
**[steven.m@phuket.psu.ac.th](mailto:steven.m@phuket.psu.ac.th)**



# Guiding Rationale



## **Surf Tourism is a fast-growing and dynamic subject area**

- Academics
- Not-for-profit organizations
- Government agencies
- Corporations
- Entrepreneurs
- Surfers



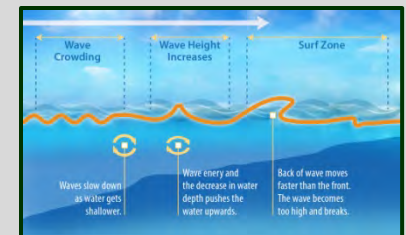
## **Surf sites around the world are under threat**

- Tourism, coastal development, pollution and other anthropogenic factors
- Protection of habitat is an increasingly important point

(Martin & Assenov, 2012)



## **Surf site conservation can benefit through the innovation of SRSI, a globally-applicable open-source methodology**





# Significance of the Study



## **✍ Provides a standardized and manageable research methodology**

- Modular, metric and descriptive
- Aimed at achieving results rather than ‘a complex methodology for only academics’ (TNC, 2007)

## **✍ Contributes knowledge useful in the socioeconomic and environmental management of coastal surfing resources**

- Serves to address the knowledge gap in the research area
- Applicable to the protection of habitat



# Objectives of the Study



1. To establish a corpus of surf tourism research literature for systematic review and to determine emergent topics, themes and theories, particularly in the area of surf resource sustainability.
2. To develop and frame surf resource sustainability indicators and indices aimed at measuring the conservation aptitude of surf sites.
3. To determine surf resource sustainability indicator importance, particularly in terms of conservation aptitude.
4. To apply the surf resource sustainability index on surf sites in Phuket, Thailand and to identify and prioritize their conservation attributes.



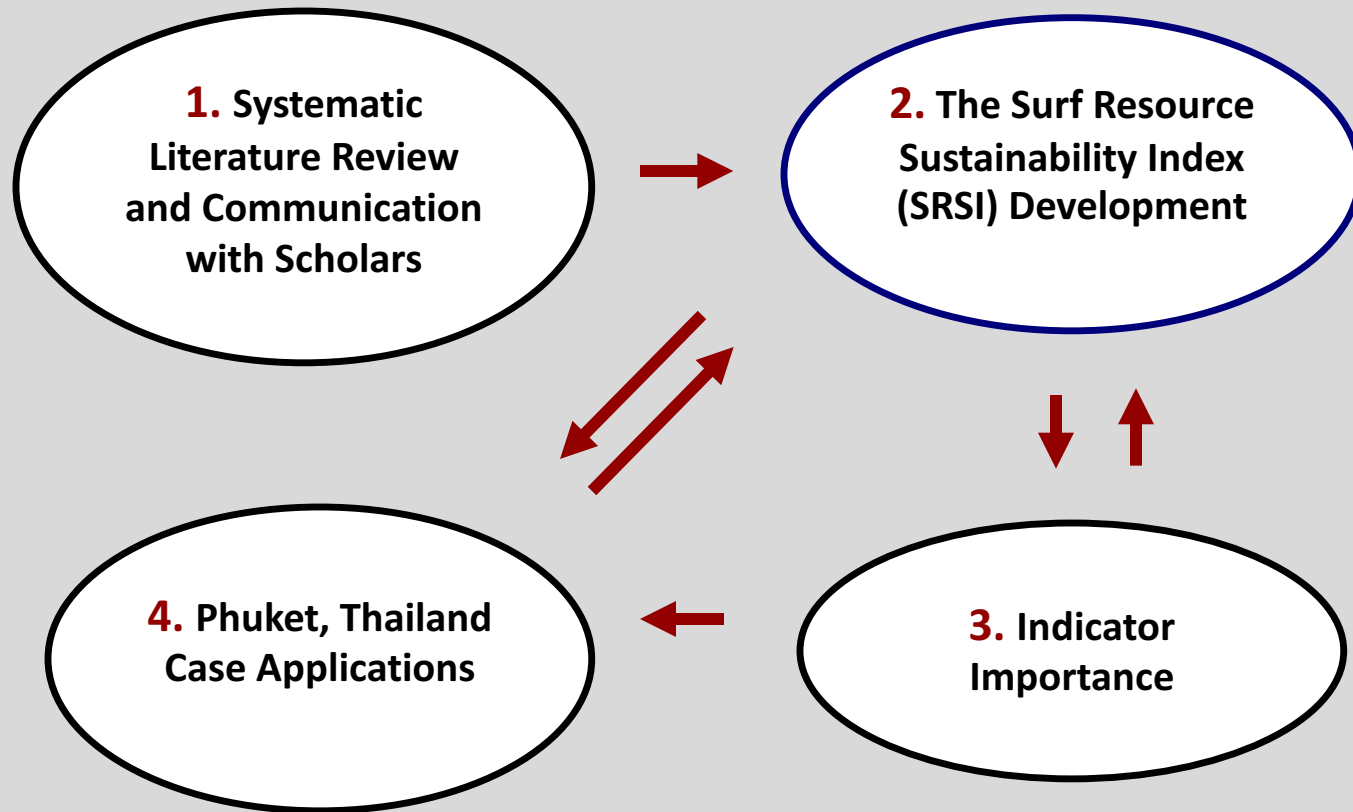


# Thesis by Publication



- ✍ Martin, S. A., & Assenov, I. (2012). **The genesis of a new body of sport tourism literature: A systematic review of surf tourism research (1997-2011)**. *Journal of Sport and Tourism*, 17(4), 257–287. doi:10.1080/14775085.2013.766528
- ✍ Martin, S. A., & Assenov, I. (in press). **Developing a surf resource sustainability index as a global model for surf beach conservation and tourism research**. *Asia Pacific Journal of Tourism Research*.
- ✍ Martin, S. A., & Assenov, I. (forthcoming). **Measuring the conservation aptitude of surf beaches in Phuket, Thailand: An application of the surf resource sustainability index**. *International Journal of Tourism Research*.

# Research Design



- Challenges in the publication and citation sequence



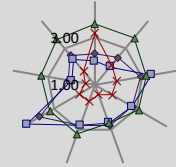
# Relevance to the Discipline



## ■ **Environmental Management**

- ✓ Ultimate aim of the Index is the protection of habitat
- ✓ Synthesis of surf-site attributes for conservation

*Social, economic, environmental, institutional*



### **Environmental Management**

Innovation of a system to improve the knowledge and management of coastal surfing resources

## ■ **Marine Tourism**

- ✓ Surf tourism management
- ✓ Conservation of coastal resources

## ■ **Social Science approach**

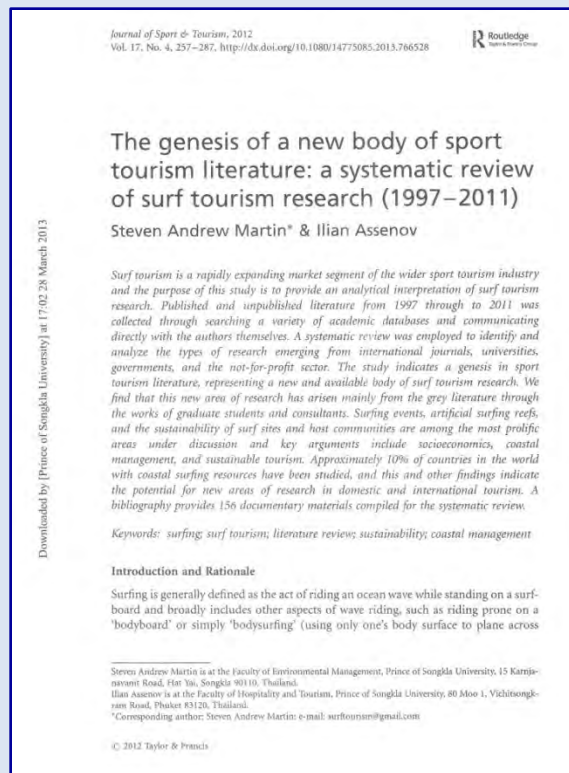
- ✓ Policy-oriented (*best practices/action planning*)
- ✓ Framework for the consultative process
- ✓ Legislation and management of coastal resources (*surfing reserve strategy development*)

# Peer-Reviewed Paper I

*Journal of  
Sport & Tourism*



# The genesis of a new body of sport tourism literature: A systematic review of surf tourism research (1997-2011)



## Journal of Sport & Tourism

2012

Vol. 17, Issue 4



Foundational work  
presented at the 4<sup>th</sup>  
Annual PSU Phuket  
Conference



# Methods & Approach of the Paper

5,000 pieces of  
research reviewed

## Systematic review

- Define the field
- Inclusion and exclusion of studies
- Extensive and ongoing internet search
- Communication with scholars in the field

## Analytical literature review

- Qualitative
- Quantitative

156 pieces of  
research included

# Knowledge Gap

- **162 Countries with surfing sites**  
Only 18 countries have been researched
- **The field of study was not clearly defined**
- **Pivotal scholars had not been identified in terms of productivity and contribution**
- **Research entities and motives were not clearly understood**  
*i.e.* what organizations are doing the research and where and why

# Outcome of the Paper

- Clearly identifies pivotal scholars in the research area based on publications and citations
- Identified stakeholder groups, such as not-for-profit sector, government agencies, councils, tourism planning organizations, surfers
- Fostered lines of communication with researchers and scholars in the field
  - Highly significant for the innovation of a new research methodology

Served as a  
bridge to the  
academic  
society

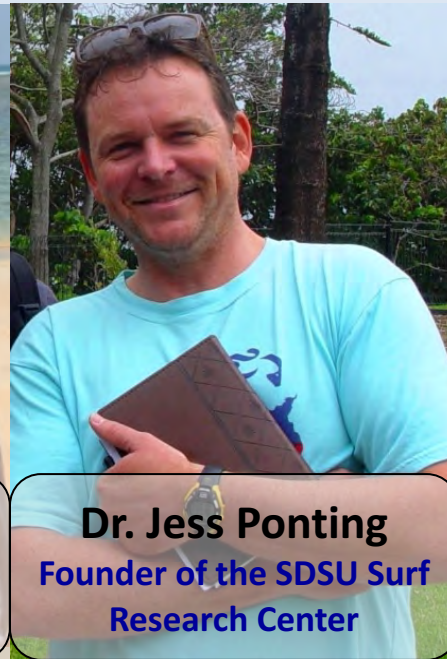




# Communication and Collaboration with Scholars in the Field



**Brad Farmer**  
National Surfing Reserve  
Chairman



**Dr. Jess Ponting**  
Founder of the SDSU Surf  
Research Center



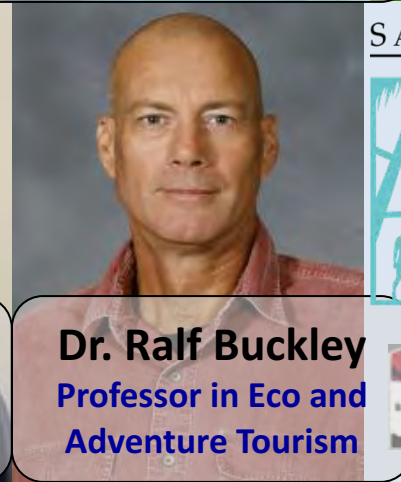
**Dr. Danny O'Brien**  
Professor of Sport  
Management



**Dr. Chad Nelsen**  
President of the Surfrider  
Foundation



**Dr. Neil Lazarow**  
Environmental Economist  
Griffith University



**Dr. Ralf Buckley**  
Professor in Eco and  
Adventure Tourism

SAN DIEGO STATE UNIVERSITY



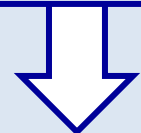
# Contribution to Knowledge

- Established the first-ever definitive corpus of research literature
- Identified key themes, theories and topics
  - Sustainability of sites
  - Capacity management
  - Rural vs. urban settings
  - Domestic vs. international tourism issues
- Identified key research entities and destinations

**“This paper has the potential to become the most cited piece of research in the field of study”**

Jess Ponting, San Diego State University

**Implications for SRSI Development**



# Implications for SRSI Development

## Identified key areas of focus for indicator and index development

- Sustainability at sites and host communities
- Coastal management and engineering
- Surf amenity and coastal protection  
*Including Artificial Surf Reefs (ASR)*
- Social implications  
*Including surf events  
Carrying Capacities*
- Economics of surf sites  
*Including surf events  
Valuation of surf sites*

■ **Surfing Reserve Criteria**

■ **Surfing Capital Criteria**

(Lazarow et al.  
2007,2008)

CONTEXT

- **Social**
- **Economic**
- **Environmental**
- **Institutional**

# Peer-Reviewed Paper II

*Asia Pacific Journal  
of Tourism Research*



# Developing a surf resource sustainability index as a global model for surf beach conservation and tourism research

## Asia Pacific Tourism Association (APTA) 2012 Best Paper Award



Accepted for Publication  
*Asia Pacific Journal  
of Tourism Research*  
(APJTR) 2013



# Knowledge Gap

- **No previous systematic or standardized approach to surf site evaluation or conservation**
  - No existing metric, modular or data-driven methodology for surf site sustainability developed
- **No previous holistic integration of social, economic, environmental and institutional attributes in surf site management or research**

# Methods – Indicator Development

- Systematic review of appropriate literature
- **Communication with scholars**
  - 6 key scholars consulted
- **58 Semi-structured interviews with experienced surfers and industry professionals from the United States, Australia and Europe**
- **11 Structured interviews on ‘indicator importance’**
  - Conducted face-to-face in Phuket, Thailand
  - Online via *Skype* and through the exchange of emails
- **Previous experience**
- ***National Surfing Reserve* criteria**
- ***World Surfing Reserve* criteria**
- ***Surfing Capital* criteria** (Lazarow et al, 2007, 2008)

Validation in  
the academic  
community

## International scope

- **Academics**
- Corporate surf executives
- Lifeguards
- Professional surfers
- Highly experienced surf tourists
- Environmentalists



# Indicator Development

- **Twenty-seven indicators developed**
  - **Criteria and implications** for conservation
    - Conservation Aptitude
    - Integrity, use, value, quality and sustainability attributes
- **Indicators framed in 4 contexts**
  - **Social**
  - **Economic**
  - **Environmental**
  - **Governance**





# 27 SRSI Indicators

## **SOCIAL INDEX** (8)

1. Clubs–Boardriders
2. Clubs–Lifesaving
3. History
4. Public safety
5. Social experience
6. Socio-psychological carrying capacity
7. Surf community
8. Surf events

## **ECONOMIC INDEX** (5)

9. Surf amenity and infrastructure
10. Surf events
11. Surf industry and commercial activity
12. Surf-related nonmarket value
13. Surf tourism

## **ENVIRONMENTAL INDEX** (8)

14. Biodiversity
15. Coastal engineering
16. Eco-physical carrying capacity
17. Hazards–Marine life
18. Hazards–Physical
19. Quality–Beach
20. Quality–Water
21. Surf type and quality

## **GOVERNANCE INDEX** (6)

22. Beach & water safety
23. Education & interpretation
24. Legislative status
25. Management
26. Not-for-profit organizations
27. Public access

# Index Development Structure

- **Development of 2-Layer Approach for Indicators**  
*(based on field trials)*
  1. **Qualitative** base level for descriptive field assessment of indicators
  2. **Quantitative** values attached to descriptive field assessment of indicators
- **Quantitative values for indices and composite index**
- **Arithmetic mean**

Index values are calculated as equally-weighted averages of the indicators composing them
- **Indicators are listed alphabetically within each index**

# 1-5 Likert scale

- Minimum and maximum indicator values are 1 and 5 respectively
- High values or qualities reflect a high aptitude for conservation
- **Five categories**
  - + very low aptitude for conservation (1.00-1.80)
  - + low aptitude (1.81-2.60)
  - + moderate aptitude (2.61-3.40)
  - + high aptitude (3.41-4.20)
  - + very high aptitude (4.21-5.00)
- A ***reverse scale*** is applied for two negative indicators (i.e. marine life hazards and physical hazards)

Indicator	Assessment Criteria (how)	Implications (why)
(25) Management	<ul style="list-style-type: none"> <li>Identify the existence of guidelines or standards for activities at the site and assess the effectiveness of enforcement <i>(i.e. gauge the active policy measures in context and practice)</i>.</li> </ul>	<ul style="list-style-type: none"> <li>The implications of management include aspects of multi- and mixed-use areas alongside beach and ocean safety.</li> <li>Conservation management is tied to planning, enforcement, and stakeholder engagement.</li> </ul>
(26) Not-for-profit organizations	<ul style="list-style-type: none"> <li>Determine the number or type of not-for-profit or related activity affecting authority and activity at the site (if any).</li> <li>Identify past and present successes and failures. Consider project support and potentialities.</li> </ul>	<ul style="list-style-type: none"> <li>Not-for-profit organizations may help to identify, monitor, report, and support issues related to the integrity of the site and its usage.</li> <li>These organizations are an indicator of conservation aptitude as they signify stakeholder engagement (e.g. <i>Surfrider Foundation</i>).</li> <li>However, successes and failures must be determined jointly and in context.</li> </ul>
(27) Public access	<ul style="list-style-type: none"> <li>Identify the level of accessibility alongside laws or other issues surrounding public right of entry, such as laws, hotels or infrastructure which inhibit or prohibit entry to sites.</li> <li>Consider if access restrictions at rural sites or islands are in an agreement with traditional resource owners and provide any conservation function.</li> </ul>	<ul style="list-style-type: none"> <li>As conservation normally considers the interaction of stakeholders with the resource as a component to sustainability, the presence of entities or infrastructure inhibiting access (public, private, or governmental) is an indication of reduced conservation aptitude.</li> <li>In unique cases, limited or restrict access may perform a conservation role by limiting over-use of the site.</li> </ul>

**In-depth discussion with the academic community via *Skype* and email**

# EXAMPLE – Assessment Chart

## GOVERNANCE INDEX

Indicator	Qualitative Assessment	Quantitative Assessment
23. Beach & water safety	<i>Description &amp; Details...</i>	<b>1 - 5</b>
23. Education & interpretation	<i>Description &amp; Details...</i>	<b>1 - 5</b>
24. Legislative status	<i>Description &amp; Details...</i>	<b>1 - 5</b>
25. Management	<i>Description &amp; Details...</i>	<b>1 - 5</b>
26. Not-for-profit organizations	<i>Description &amp; Details...</i>	<b>1 - 5</b>
27. Public access	<i>Description &amp; Details...</i>	<b>1 - 5</b>

# EXAMPLE – Environmental Index

**15. Coastal engineering:** Decades of dredging from the maritime tin mining industry has altered the coastal area. Given that the area was not surfed prior to the tin mining era, the effect on coastal surfing resources cannot be identified for sure. Interviewees speculate that there were reef breaks at one time, whereas today there are only near shore beach breaks.

3

**16. Eco-physical carrying capacity:** Surfers cause a relatively low impact at the site in relation to other activities occurring at the beach, such as jet ski rentals and parasail boats. Interviewees suggest that the ecological carrying capacity for surfers is relatively high.

4

**19. Quality — Beach:** Extensive foreshore developments fronting the surfing area and issues of encroachment by beach concessions are well-known (e.g. reported in the Phuket media). Beach litter, while a visible and daily issue, is normally gathered and removed by beach concessions in the mornings. Beach litter is better controlled than at larger beaches (e.g. Karon and Kamala).

3

**20. Quality — Water:** While there are no major klongs (canals) at the site, urban runoff is suspect and restaurants and hotels may be point sources of pollution. Issues of water quality may be associated with the loss of coral reefs in the past and due to the suspension of mine tailings during the surf season.

3.5

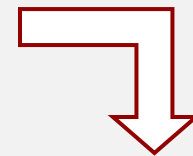


# Limitations of the Paper

- Perceptive index approach
  - Applicability may sacrifice objectivity*
- Subjective nature of measuring various attributes
  - For researchers and respondents alike*
- The researchers ultimately gave the final numerical assessment scores
- Measures and context are limited to ‘aptitude’
  - could be ‘threat based’ (TNC, 2007) or ‘conservation value’*
- Subordination and assessment of indicator criteria could be reinterpreted
  - e.g. Beach quality includes coastal erosion*
- Case trials conducted only in Phuket
- Stakeholder weighting schema not yet employed

# Contribution to Knowledge

- **First-ever index for surf site evaluation**  
Developed metric – modular approach and data-driven methodology for surf site sustainability
- New approach to surf site assessment becomes available as an open-source methodology
- **Theoretical and Managerial Contributions**



# Contribution to Knowledge

- **Theoretical socio-dynamics thread**

- The value brought to the academia

- Bridges existing knowledge gaps

- Develops lexicon for the research area

- Standardization of terminology

SRSI

- **Practical policy and management thread**

- Develops the knowledge needed to rank and prioritize surf sites for tourism management and conservation

- Provides a knowledge-generating system to meet the needs of the resource and the stakeholders

# Peer-Reviewed Paper III

*Journal of Tourism Research*

# Measuring the conservation aptitude of surf beaches in Phuket, Thailand: An application of the surf resource sustainability index

International Journal of  
Tourism Research



Research Presented at the Inaugural  
Global Surf Cities Conference  
Gold Coast, Australia, 2013

*Journal of Tourism  
Research*

*Under final stage of review*

# Aims of the Paper

## ***✚ To conduct a comprehensive application of the Surf Resource Sustainability Index***

- To test the applicability and reliability of SRSI in a practical setting (a variety of beaches)
- To place the index in a cross-sectional context
- To gauge the limitations and repeatability of the index as a global model

## ***✚ To investigate the conservation attributes of surf sites in Phuket***

- To contribute to the understanding and conservation of surf sites in Phuket
  - To foster the protection of habitat



*Kata Noi Beach, Phuket*



# Methods and Approach of the Paper

## ■ Field assessments

- Visiting sites, participant observation, prior knowledge, and through personal interviews with surfers

## ■ Participant observation

- Communication with local surfers at specific sites
- While waiting for waves in the surfline
- Through follow-up emails and phone conversations

SRSI

## ■ Prior knowledge based on life experience and previous research in the region

- (Martin, 2009, 2010a, **2010b**; Martin & Assenov, 2011, 2012a, 2012b, in press)

## ■ 71 Semi-structured personal interviews

- Carried out at the Phuket Surfing Contest at Patong Beach, Thailand, in September of 2011 and 2012
- Interviews were also carried out at local surf sites when possible with surfers and other stakeholders
- Thai, expatriate and visiting surfers



# SRSI Assessments

## Phuket, Thailand

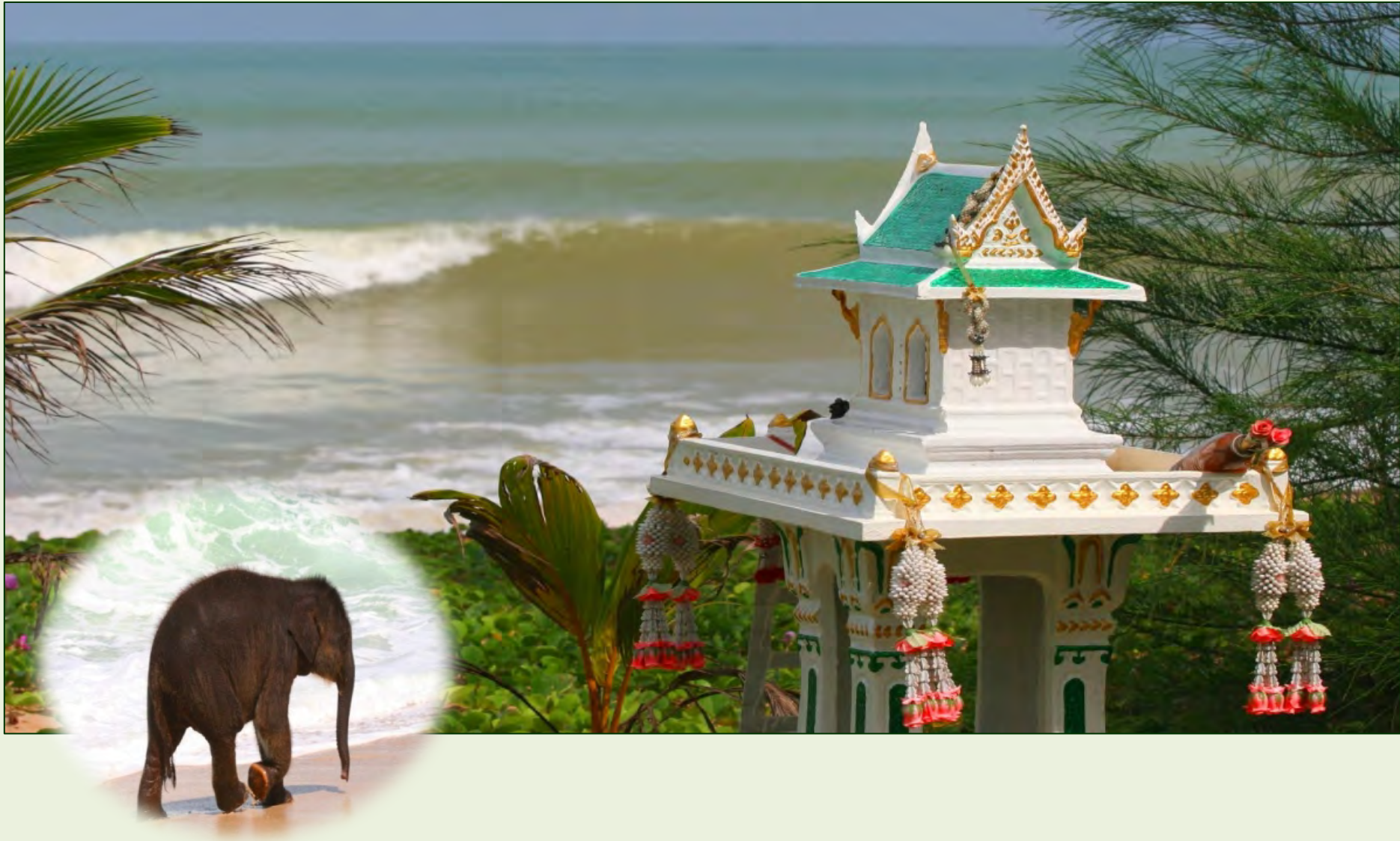
2013

SRSI

SOCIAL  ECONOMIC  ENVIRONMENTAL   
GOVERNANCE



# Thailand





# Surf Tourism In Phuket



amazing  
THAILAND



# 2007 PHUKET SURFING CONTEST

A photograph of a surfing competition. A surfer in a red shirt is riding a wave, with another person in a blue shirt visible in the background. The water is green and white with foam.

## KATA BEACH, PHUKET



An aerial photograph of a tropical coastline. In the foreground, a lush green hillside is dotted with several buildings, including a prominent multi-story white building. The hillside slopes down to a small beach and a turquoise bay. In the background, a larger bay with a sandy beach is visible, surrounded by dense green forest and hills. A tall white building is visible on the right side of the background bay.

“**Thailand** is a place that people don't ordinarily associate with surfing or the challenges associated with a burgeoning ‘niche’ **surf tourism** destination”

*Danny O'Brien*  
*Bond University*

✚ The popularity of surfing is increasing

✚ Thais, foreign residents, domestic tourists, international tourists

✚ Research and knowledge lag far behind the growth of the activity



# Meteorology & Wave Types of the Andaman Sea

## The Southwest Monsoon

May through October

Southwest – West Windswell

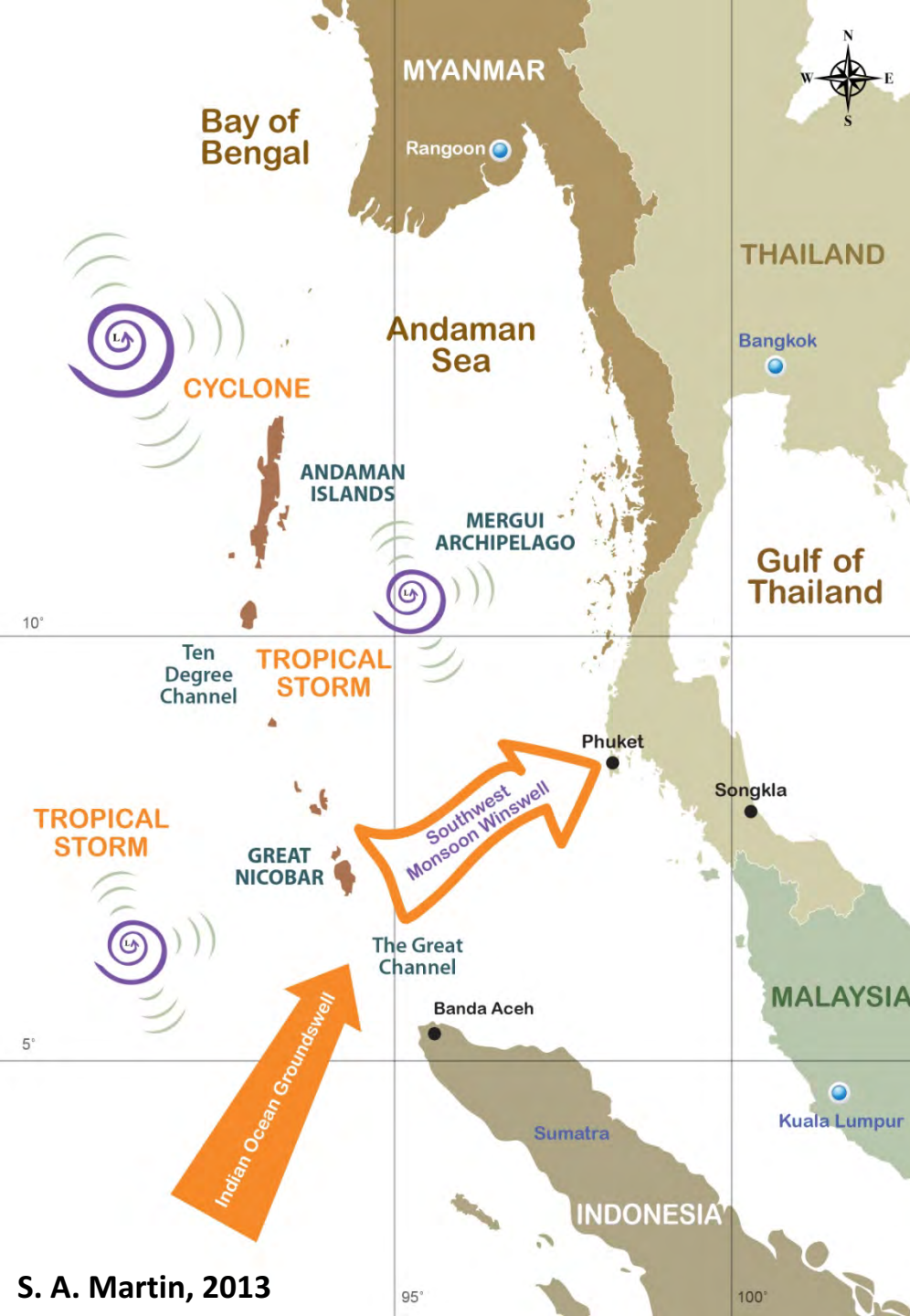
## Indian Ocean Groundswell

Quality Waves

Potential To Arrive Year-round

## Cyclonic activity

Depressions, Tropical Storms  
& Cyclones





# Bathymetry of the Andaman Coast

**Bathymetry varies at different latitudes** along Thailand's Andaman Coast, affecting wave speeds and heights

## The Coastal Shelf

**110 km wide in the north**  
Ranong and Phang Nga

**25 km near Phuket**  
The deepest water on Thailand's Andaman Coast

**130 km in the south**  
Krabi, Trang & Satun



20-40

Andaman  
Sea

Phang Nga

Sai Kaew Beach  
Sirinat  
National Park  
Mai Khao Beach

Mai Khao Beach

Nai Yang Beach

0-20

Nai Thon Beach  
Nai Thon Noi Beach

Trisara Beach  
Layan Beach

Phuket

Bang Thao Beach

Pansea Beach  
Surin Beach  
Laem Sing Beach

Kamala Beach

Nakhale Beach  
Kalim Beach  
Patong Beach

Freedom Beach

Relax Beach  
(Karon Noi Beach)

Karon Beach

Kata Beach  
Kata Noi Beach

Naiharn Beach

Phuket Town

0-20

National Park area

BATHYMETRY IN METERS

40-60	20-40	0-20
-------	-------	------

S. A. Martin

# Main Surf Beaches of Phuket

(approximately 30 sites)

✚ Nai Yang Beaches & Reefs

✚ Surin Beach

✚ Bang Tao Beach

✚ Kamala Beach

✚ Kalim Reef

✚ Kata Yai Beach

✚ Kata Noi Beach

✚ Nai Harn Beach





# SRSI Thailand



Nai Yang center

# SOCIAL INDEX (*SocSRSI*)

Kata Noi

Surin

Kamala

Kalim

Karon

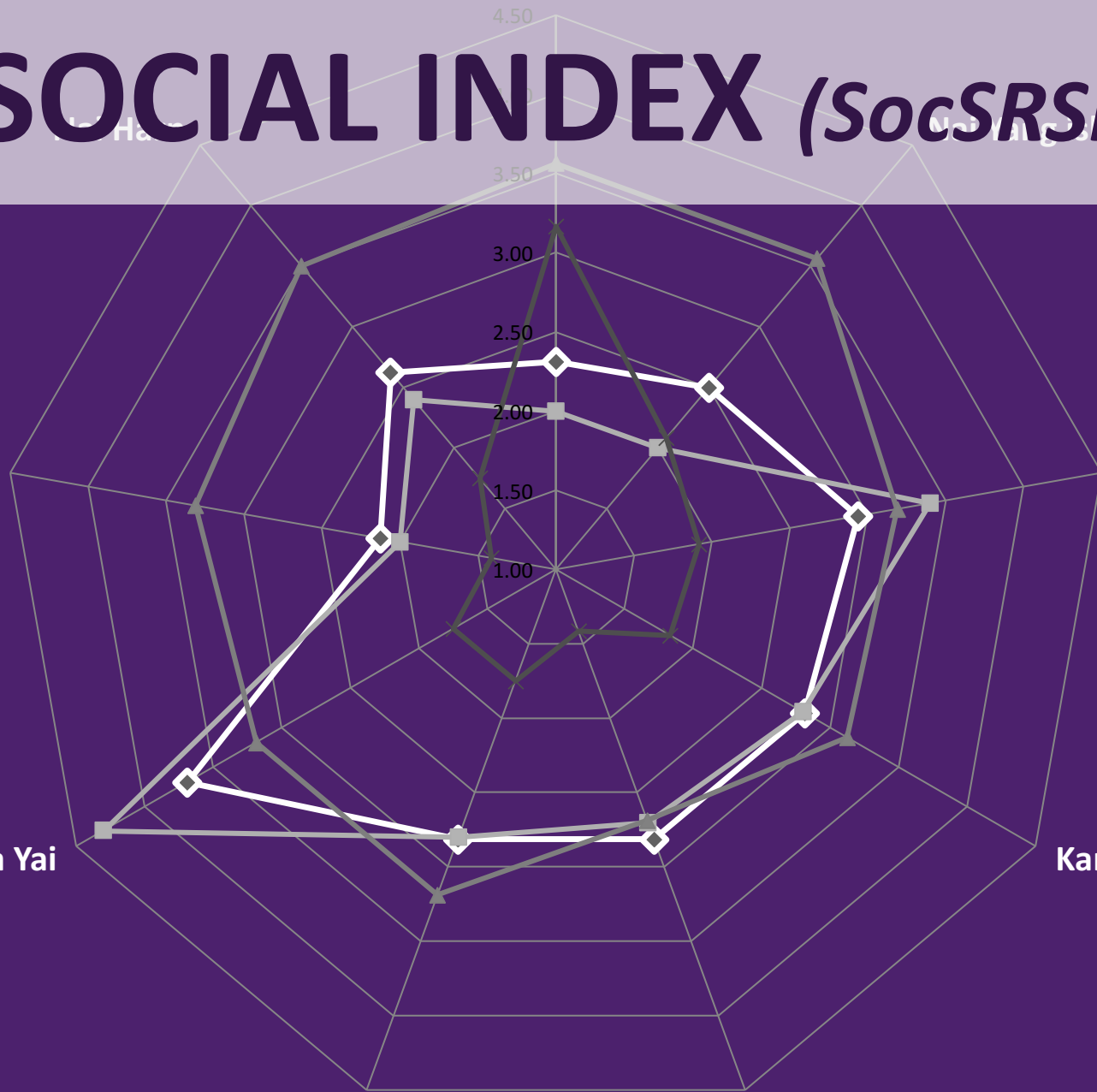
Kata Yai

—◆— socSRSI

—■— econSRSI

—▲— envSRSI

—▼— govSRSI





# SOCIAL SITE ASSESSMENTS FOR PHUKET

**(SocSRSI)**

## SOCIAL INDEX

	Nai Yang (Reef)	Nai Yang (Island)	Surin Beach	Kamala Beach	Kalim Beach	Karon Beach	Kata Yai Beach	Kata Noi Beach	Nai Harn Beach	Mean
(1) Clubs – <u>Boardriders</u>	1.5	1.5	1.5	<u>2.5</u>	1	<u>2.5</u>	<u>3</u>	1	1	1.72
(2) Clubs – Lifesavers	1	1	2	1.5	1	1	1	1	1	1.17
(3) <u>History</u>	2	2	3	3	3	2	4.5	3	3	2.83
(4) Public safety	4	4	3.5	3	4	4	4	2	4	3.61
(5) Social experience	5	4.5	4	3	3.5	4	4	3	3.5	3.83
(6) Socio-psychological carrying cap.	2	4	3.5	4	4	4	4.5	3	3	3.56
(7) Surf community	2	2	4	3	3	3	4.5	3	3	3.06
(8) Surf events	1	1	2	2.5	3	2	4	1	2.5	2.11
Mean	2.31	2.5	2.94	2.81	2.81	2.81	3.69	2.13	2.63	2.74



# SURIN BEACH Social Index (*SocSRSI*)

- 1. Clubs — Boardriders:** While no formal boardriders club exist at the site, local surf bars may create an informal club atmosphere and serve as gathering place for boardriders. **1.5**
  - 2. Clubs — Lifesaving:** There are currently no lifesaving clubs or culture. However, surfers perform rescues and respond to aquatic accidents at times. There are officially no lifesaving programs for local youths, but occasional education activities are provided by local expatriates. **2**
  - 3. History:** While the site has some degree of surfing history, there has been very little documentation. Prior to the development of roads to the area in the 1990s (which connected the site to southern beaches), surfing activities occurred in isolation. **3**
  - 4. Public safety:** Interviewees report occasional crime in the parking area and clashes among beach vendors. **3.5**
  - 5. Social experience:** Interviewees suggest that surfing in the area provides good experience with a relatively low level of localism or other negative social issues. **4**
  - 6. Socio-psychological carrying capacity:** A variety of peaks spread out over the length of the beach provide a number of spots where surfers gather to catch the waves, providing more surfing space than many other reefs or point breaks in Phuket. **3.5**
  - 7. Surf community:** Two generations of Thai surfers at the site, with the newer generation comprised mainly of teens. Expatriate surfers are a significant component of the community, serving as role models, lending equipment, and offering free surf lessons to the Thai youths. **4**
  - 8. Surf events:** Little or no surf event activity at the site. Local surfers attend nearby competitions, such as those at Kamala Beach. **2**
-

# SURFING CLUBS





# THAI & FOREIGN RESIDENT SURF COMMUNITY



Nai Yang center

# ECONOMIC INDEX (*EconSRSI*)

Kata Noi

Surin

Kamala

Kalim

Karon

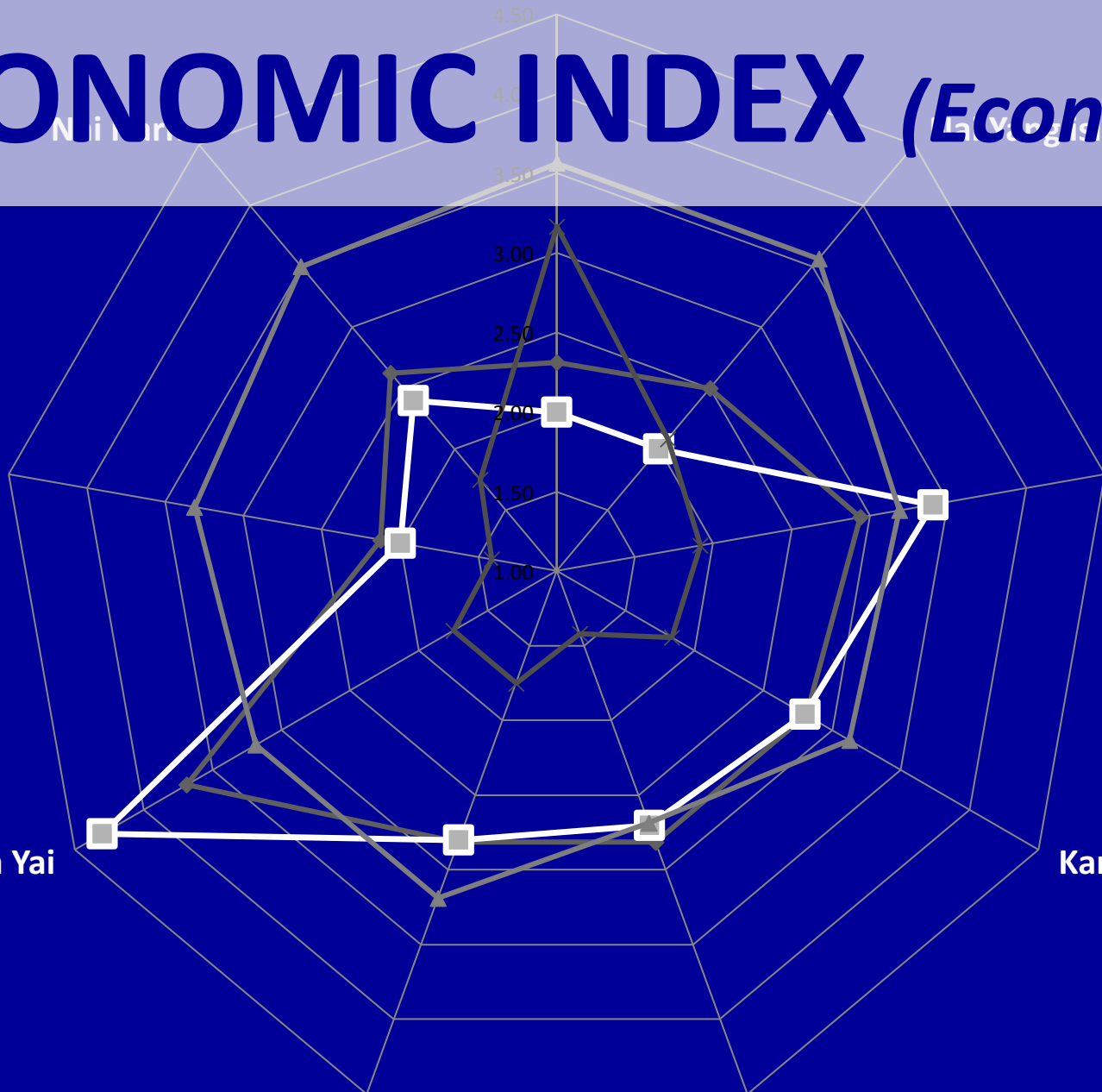
Kata Yai

—●— socSRSI

—■— econSRSI

—▲— envSRSI

—✕— govSRSI



# ECONOMIC SURF SITE ASSESSMENT PHUKET

***(EconSRSI)***

**Nai Yang  
(Reef)**

**Nai Yang  
(Island)**

**Surin  
Beach**

**Kamala  
Beach**

**Kalim  
Beach**

**Karon  
Beach**

**Kata Yai  
Beach**

**Kata Noi  
Beach**

**Nai Harn  
Beach**

***Mean***

## ECONOMIC INDEX

**(9) Surf amenity & infrastructure**

**3**

**2**

**3.5**

**2.5**

**2.5**

**3**

**4**

**2**

**2**

***2.72***

**(10) Surf events**

**1**

**1**

**2**

**2.5**

**3**

**2**

**4**

**1**

**1**

***1.94***

**(11) Surf industry & commercial**

**2**

**2**

**3.5**

**2.5**

**2**

**2**

**4**

**1.5**

**2**

***2.39***

**(12) Surf-related nonmarket**

**3**

**3**

**4**

**3.5**

**3.5**

**3.5**

**4.5**

**2.5**

**4**

***3.50***

**(13) Surf tourism**

**1**

**2**

**4**

**3**

**2.5**

**3.5**

**5**

**3**

**3**

***3.00***

***Mean***

***2***

***2***

***3.4***

***2.8***

***2.7***

***2.8***

***4.3***

***2***

***2.4***

***2.71***



# International Surfing Competitions in Phuket

*“Economic indicators are  
the sharpest tools in the  
shed”*

Brad Farmer  
National Surfing Reserves



Photo: Tim Hain



# THAI SURF TOURISM ENTREPRENEURS, KATA BEACH





# SURF TOURISM



**THE RUSSIANS  
are coming!**





**COBRA INTERNATIONAL**



**Karon Beach, Phuket**

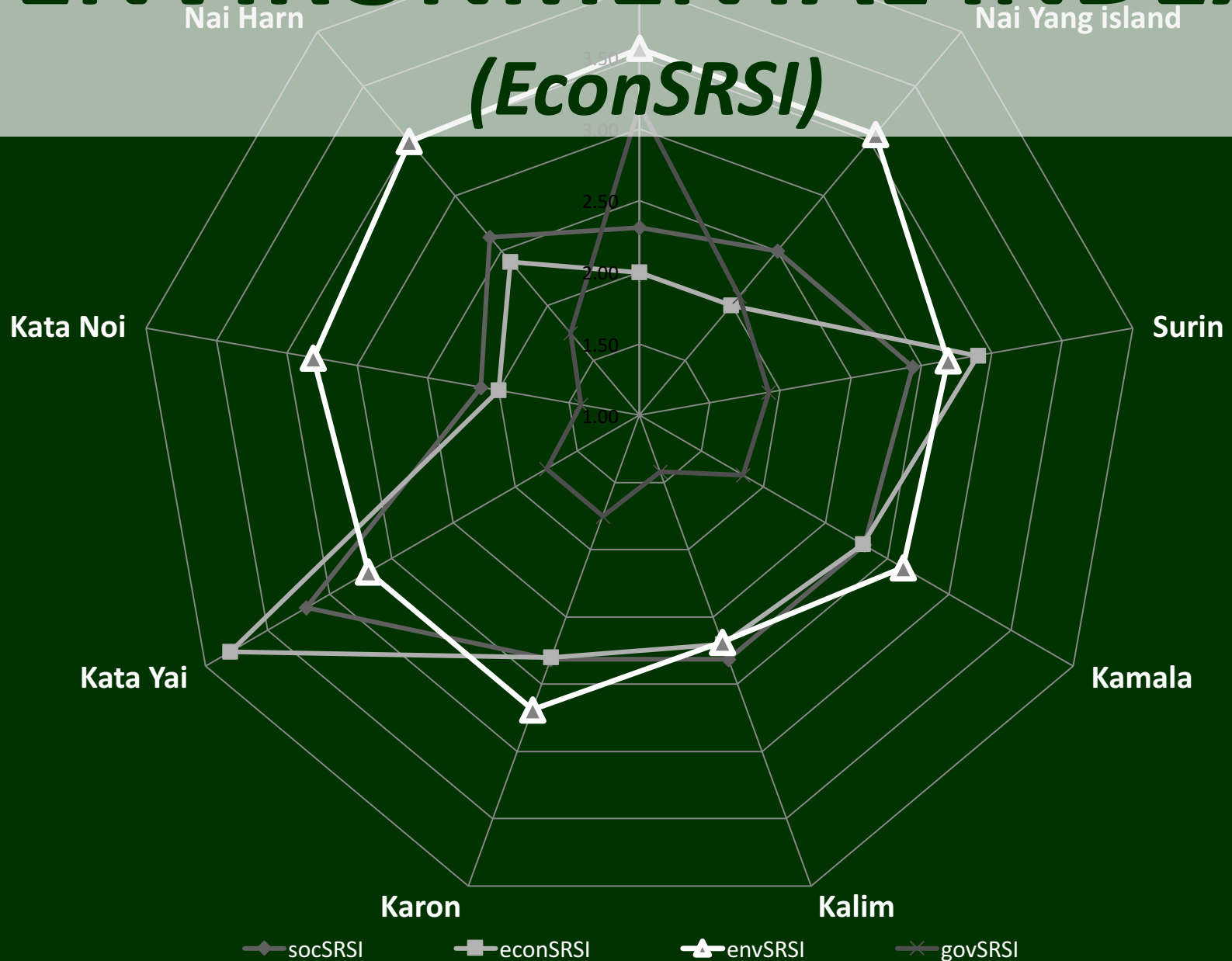
**Board Rental Stands have  
Mushroomed since 2008**



## Nai Yang center

# ENVIRONMENTAL INDEX

***(EconSRSI)***



# ENVIRONMENTAL SURF SITE ASSESSMENT PHUKET

***(EnvSRSI)***

Nai Yang  
(Reef)

Nai Yang  
(Island)

Surin  
Beach

Kamala  
Beach

Kalim  
Beach

Karon  
Beach

Kata Yai  
Beach

Kata Noi  
Beach

Nai Harn  
Beach

***Mean***

## ENVIRONMENTAL INDEX

(14) Biodiversity	4	3.5	2	2	1	2	2	2	2.5	<b><i>2.33</i></b>
(15) Coastal Engineering	4	4	3	3	2	3	3	2	3	<b><i>3.00</i></b>
(16) Eco-physical Carrying Capacity	2	4	4	4	3	4	4	4	4	<b><i>3.67</i></b>
(17) Hazards – Marine ( <i>reverse scale</i> )	3.5	3.5	4	4	4	4	4	4	4	<b><i>3.89</i></b>
(18) Hazards – Physical ( <i>reverse scale</i> )	3	3	2.5	3	3	3	3	3	2.5	<b><i>2.89</i></b>
(19) Quality – Beach	3.5	3	3	3	2.5	3.5	3	3.5	4	<b><i>3.22</i></b>
(20) Quality – Water	4.5	3.5	3.5	3	2	3	2.5	4	4	<b><i>3.33</i></b>
(21) Surf Type & Quality	4	4	3.5	3	4	3	4	4	4	<b><i>3.72</i></b>
<b><i>Mean</i></b>	<b><i>3.56</i></b>	<b><i>3.56</i></b>	<b><i>3.19</i></b>	<b><i>3.13</i></b>	<b><i>2.69</i></b>	<b><i>3.19</i></b>	<b><i>3.19</i></b>	<b><i>3.31</i></b>	<b><i>3.5</i></b>	<b><i>3.26</i></b>



# Coastal Erosion

⚡ Beach Integrity





# Beach Litter

✂ Beach Integrity





A photograph of a beach heavily littered with marine debris. In the foreground, there are large clumps of green and red plastic mesh, several pieces of clear plastic, and a dark, curved object that looks like a piece of driftwood or a large shell. The middle ground shows more debris scattered across the sand, including what appears to be a piece of a boat or a large net. In the background, waves are breaking onto the shore under a clear blue sky. The text "Marine Debris" is overlaid in a large, bold, dark font, and "to Beach Integrity" is overlaid in a smaller, dark font below it.

# Marine Debris

to Beach Integrity

Nai Yang center

# GOVERNANCE INDEX

Nai Harn

Nai Yang island

*(GovSRSI)*

Kata Noi

Surin

Kata Yai

Kamala

Karon

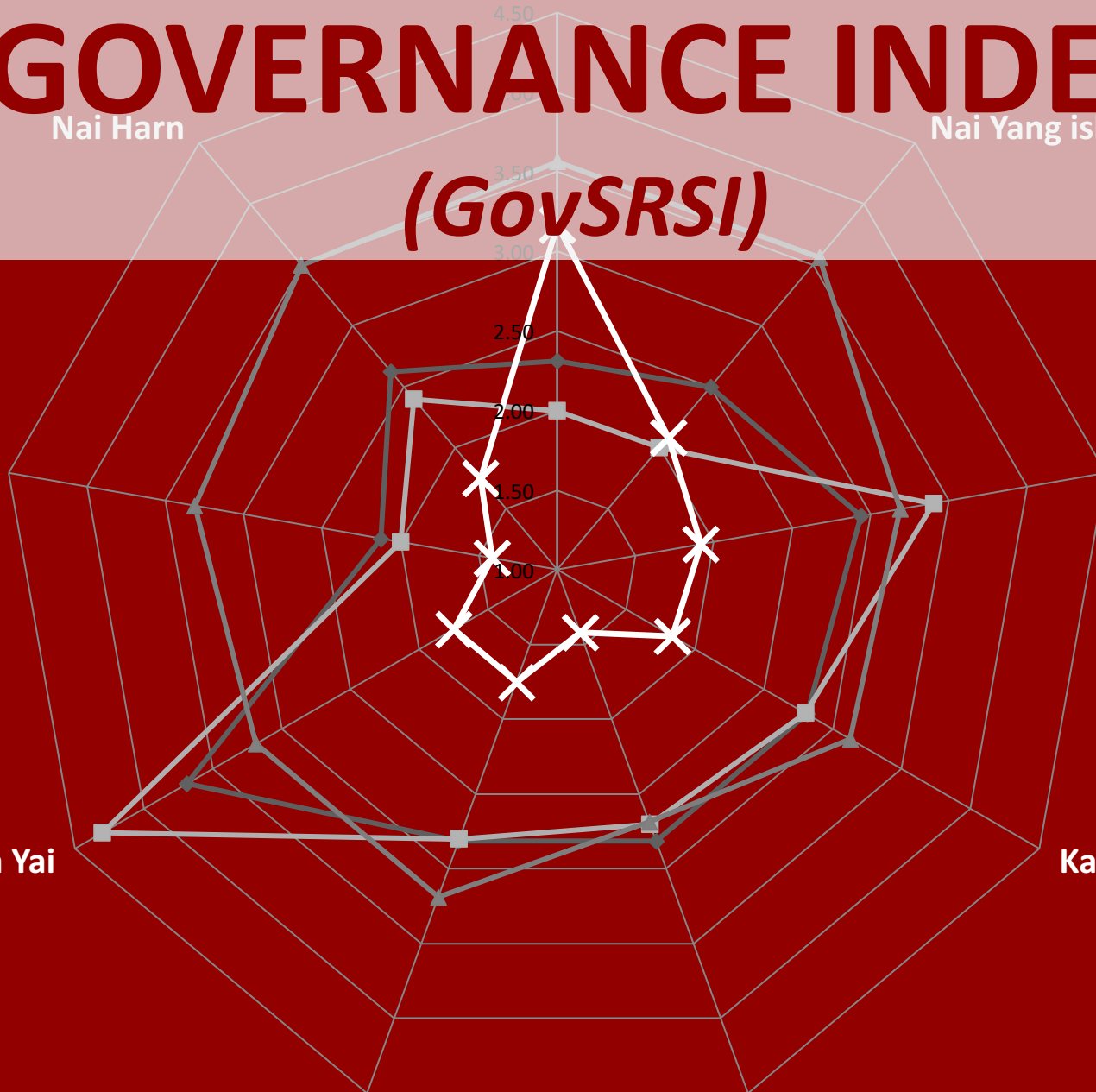
Kalim

—●— socSRSI

—■— econSRSI

—▲— envSRSI

—✕— govSRSI



# GOVERNANCE SITE ASSESSMENT PHUKET

**(GovSRSI)**

Nai Yang  
(Reef)

Nai Yang  
(Island)

Surin  
Beach

Kamala  
Beach

Kalim  
Beach

Karon  
Beach

Kata Yai  
Beach

Kata Noi  
Beach

Nai Harn  
Beach

**Mean**

## GOVERNANCE INDEX

(22) Beach & water safety	2.5	1	2.5	2	1.5	2.5	2.5	2	2	<b>2.06</b>
(23) Education & interpretation	2.5	1	2	2	1	2	2	1.5	2	<b>1.78</b>
(24) Legislative status	4	4	1	1	1	1	1	1	1	<b>1.67</b>
(25) Management	2.5	2	1	1	1	1	1	1	1	<b>1.28</b>
(26) Not-for-profit organizations	3.5	1.5	1.5	2.5	1	1	1	1	1	<b>1.56</b>
(27) Public access	4	3	3.5	2.5	3	3	3	2	3.5	<b>3.06</b>
<b>MEAN</b>	<b>3.17</b>	<b>2.08</b>	<b>1.92</b>	<b>1.83</b>	<b>1.42</b>	<b>1.75</b>	<b>1.75</b>	<b>1.42</b>	<b>1.75</b>	<b>1.90</b>



# UNMANAGED MIXED-USE AREAS







องค์การบริหารส่วนจังหวัดภูเก็ต  
Phuket Provincial Administrative Organization

โครงการรักษาความปลอดภัยชายฝั่ง Lifeguard Project



**RED AND YELLOW - ชงแดงและเหลือง**  
Patrolled area - the safest swimming area  
มีเจ้าหน้าที่ Lifeguard คอยดูแล ควรเล่นน้ำในบริเวณนี้



**Patrolled beach**

หาดนี้มีเจ้าหน้าที่ Lifeguard คอยดูแล

สามารถเล่นน้ำได้ในพื้นที่ระหว่างธงเหลืองแดงที่ปักไว้ รับชมชายหาดท่านั้น



**YELLOW - ชงเหลือง**  
Warning - potentially dangerous condition  
ควรระมัดระวังในการเล่นน้ำในบริเวณนี้



**Strong current - Rip current**

อันตราย - ร่องน้ำลึก



**RED - ชงแดง**  
Beach closed - do not enter water  
ปิดหาด - ห้ามลงเล่นน้ำโดยเด็ดขาด



**No swimming**

ห้ามลงเล่นน้ำ

เล่นน้ำปลอดภัยโปรดเชื่อฟังคำเตือนจากเจ้าหน้าที่ Lifeguard Safest swimming warning from Lifeguard officer

**EDUCATION & INTERPRETATION**

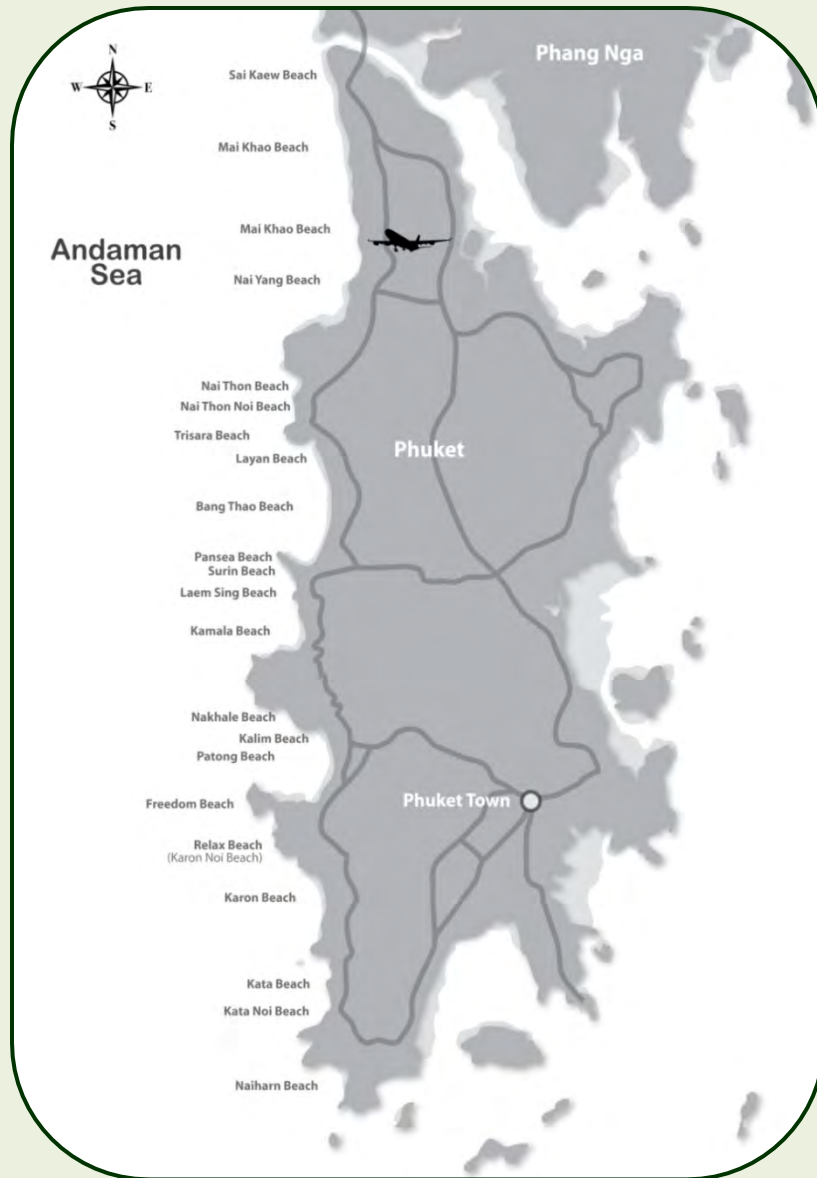




**Surf Site Not-for-Profit  
Organization**



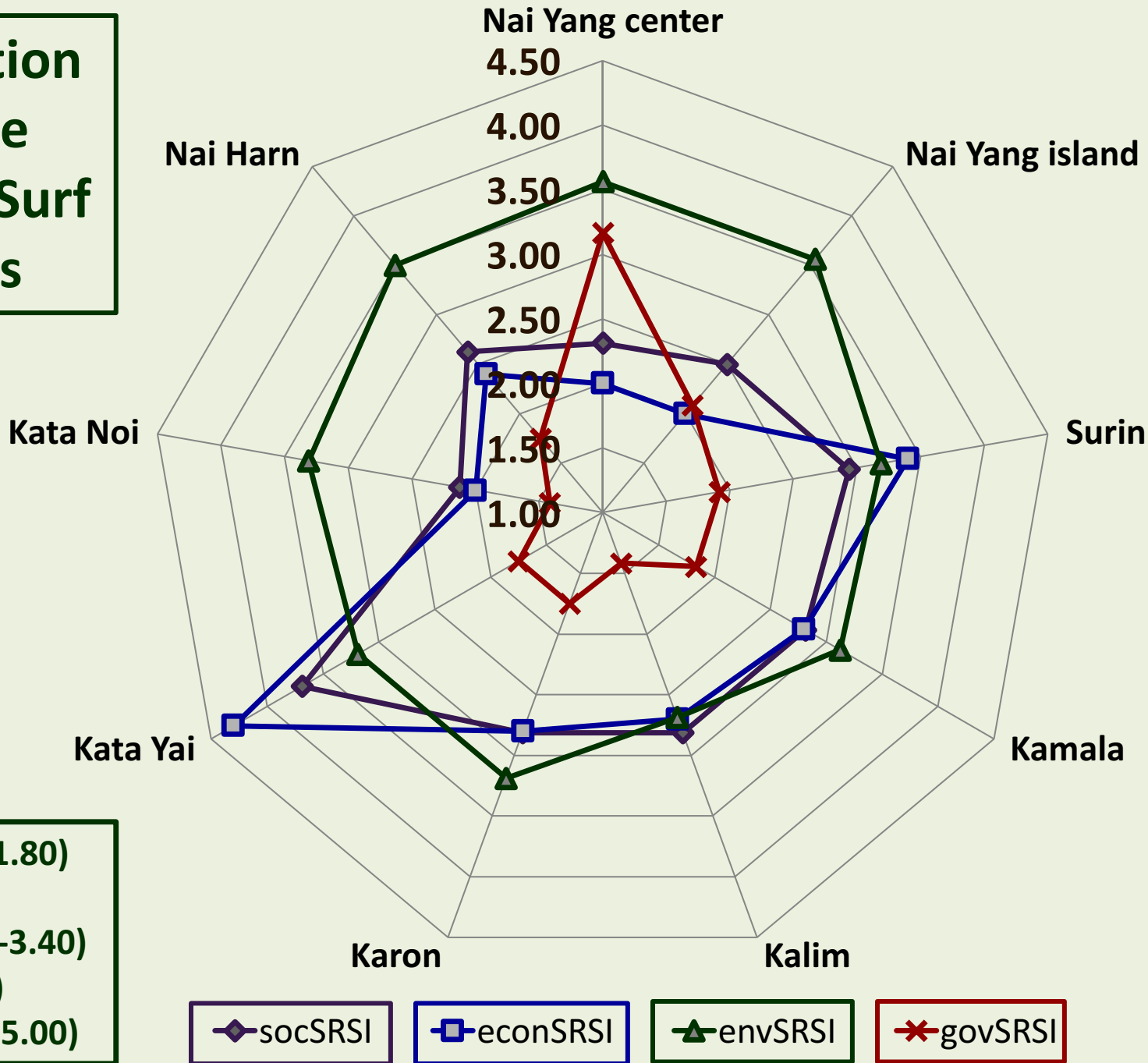




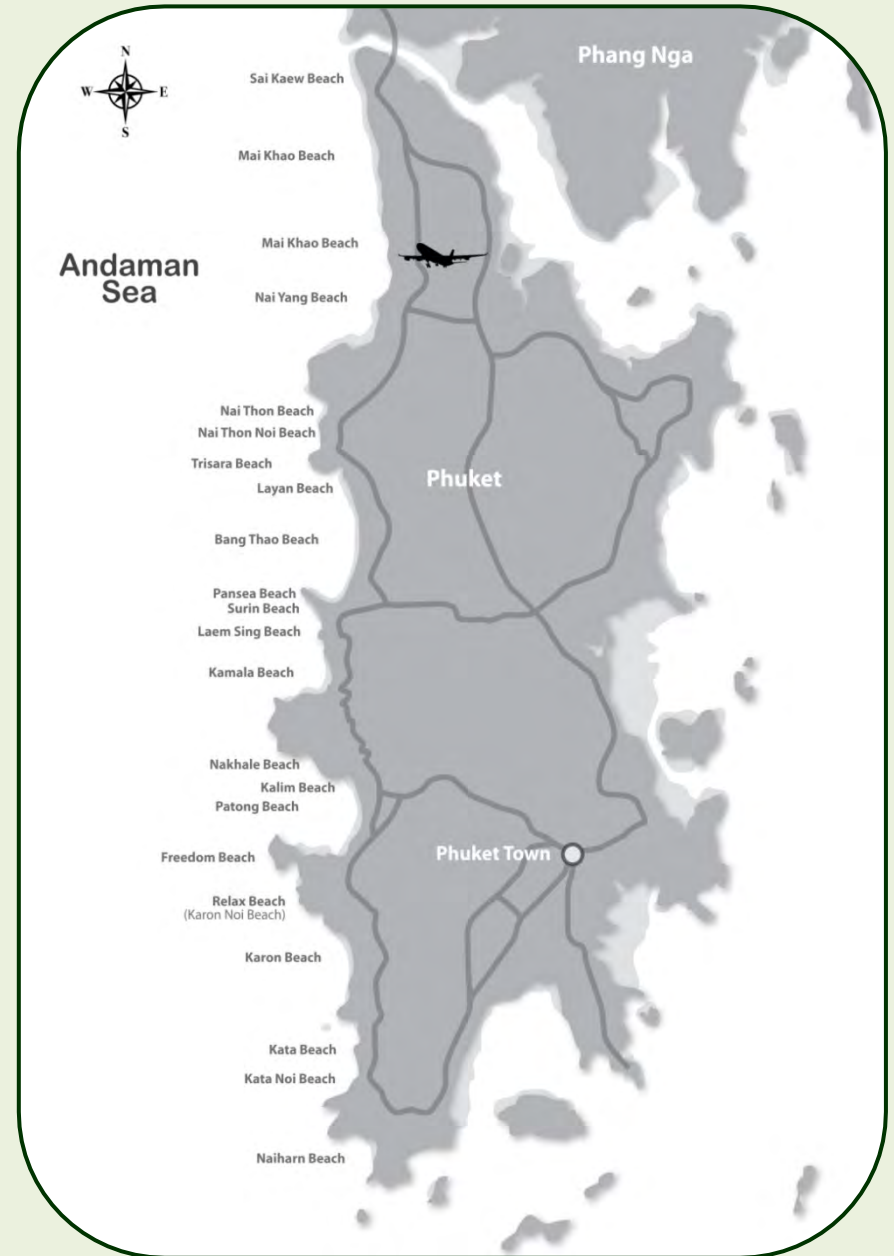
# BEACH INDEX MEAN VALUES PHUKET



# Conservation Aptitude 9 Phuket Surf Beaches



# INDICATOR MEAN VALUES PHUKET

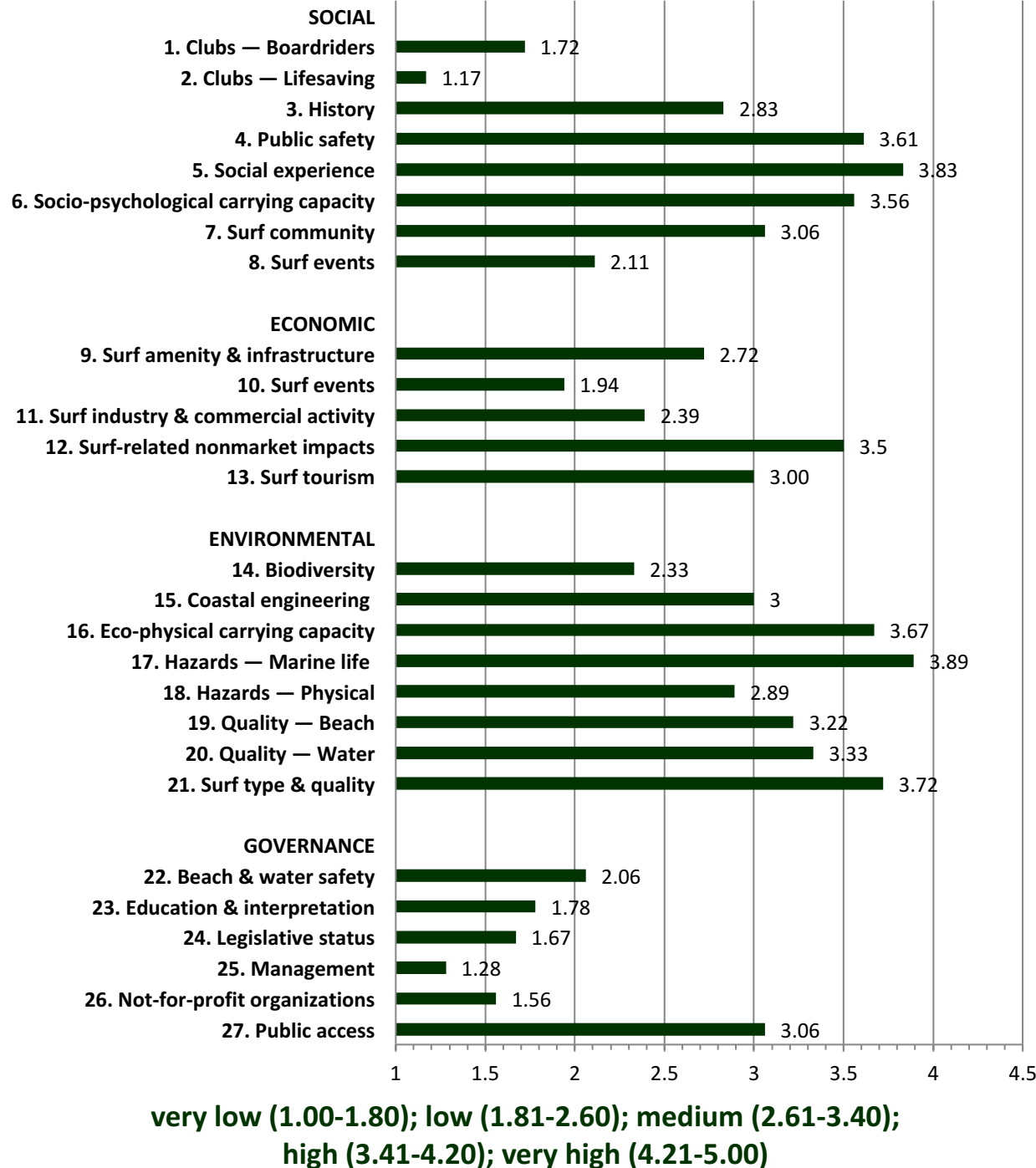




# MEAN INDICATOR VALUES

Conservation  
Aptitude

Phuket Surf  
Beaches



Life Saving  
(very low)

Social  
Experience  
(high)

Non-market  
(high)  
Surf Tourism  
(medium)

Bio-  
diversity  
(low)

Legislation &  
Mgt.  
(very low)

# Limitations of the Paper

- Perceptive field surveys based on a single stakeholder group could lead to potential bias
- Required a high level of familiarity
  - Judgments were based on the researchers' own observations
- Requires in-depth local knowledge
- Complexity is a possible limiting factor in terms of the usefulness and global applicability of the model
- Exact approach adopted in this study may not be ideal in all cases
  - Conducting research at large coastal areas
  - Sites which are isolated in terms of amenities and access (such as surf tourism sites accessible only by charter boats)

**Note: Interviews with Thai fishers and hotel staff were disqualified**

**Applicability sacrifices objectivity/reliability**

**Rural vs. urban environments**

# Contribution of the Study

- **Methodological process of the index improved**

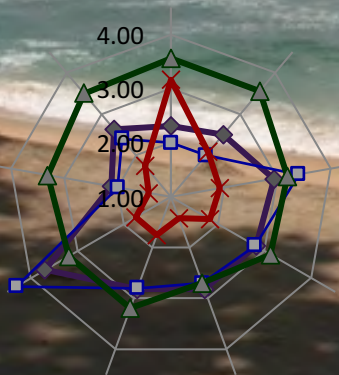
- Future applications and adaptability
  - Issues of replicability of the model were identified



- **Produced new systematic knowledge on coastal surfing resources for Phuket, Thailand**

- Generated comprehensive qualitative and quantitative data
- Opened a pathway for *Surfing Reserves* in Thailand

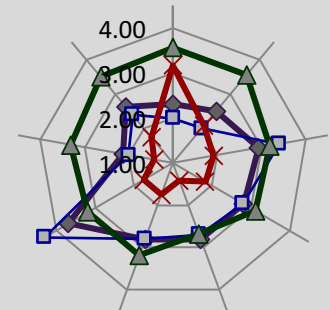
# CONCLUDING ARGUMENTS of the DISSERTATION





# Limitation, Bias, Reliability

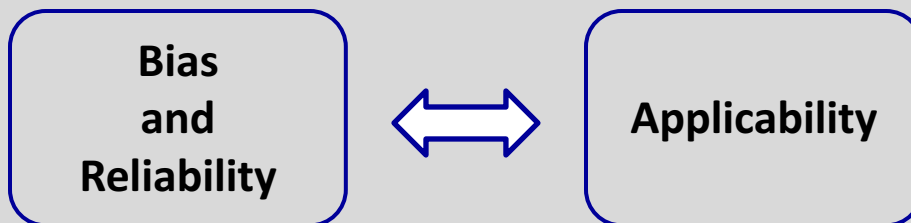
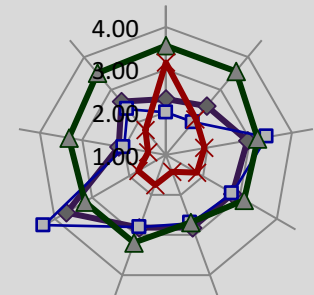
- Perceptive index approach
  - Lacks hard science data (R)*
  - Perceptive field surveys based primarily on surfers (B & R)*
- Judgments are ultimately based on the researchers' own synthesis (B & R)
- Subordination of indicator criteria (L)
- Method requires in-depth understanding and knowledge of the resource (L)
- Testing based on equal weights (L)
- Case trial on a single island (L)
- Usefulness and global applicability of the model was not tested in other locations (L & R)



# Limitation, Bias, Reliability

## Two key aspects of reliability

- **Development of the method**
  - Validation in academic community
  - Peer-review process
- **Application of the method**
  - Validation through the qualitative layer of the index

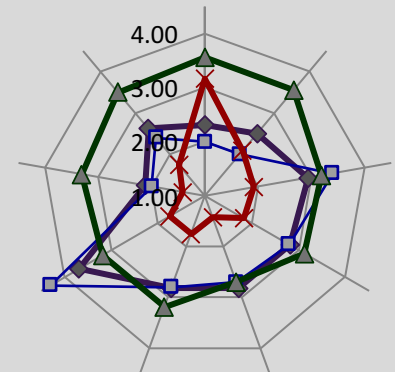


### Issue of compromise

between bias and reliability and the broader applicability

# Contribution of the Dissertation

- **Innovation of a data-driven index methodology for employing comprehensive metrics related to surf site sustainability**
  - Introduces a new conservation area and methodology to the academia
  - Introduces a system to rank and prioritize surf sites for tourism management and conservation
- **Bridges existing knowledge gaps in surf site conservation**
- **Develops lexicon for the research area**
- **Brings knowledge and awareness of the resource to Phuket**





# Broad Implications of the Index

## Validation of the new methodology

- Affords new opportunities for site assessments, conservation awareness and ultimately the protection of habitat

## Provides a framework for a consultative process

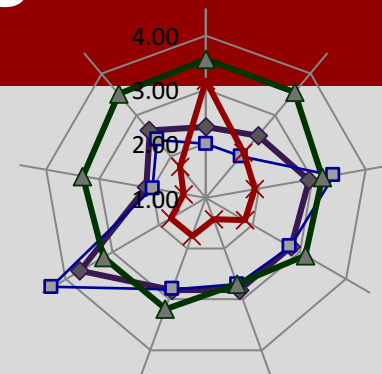
## Facilitates policy-makers and researchers from different field locations to generate and exchange information and data for the protection of habitat

## Reasonably applicable – Potential open-source methodology

- Available to surfers and other stakeholders, graduate students, academics, governments, not-for-profit organizations

# Practical Applications

- Pinpoints **problematic site aspects**
- Pinpoints **favorable site attributes**
- Ideal for comparing surf sites in the same area or region
  - **Cross-sectional analysis**
- Identifying changes over time at a given surf beach
  - **Trend analysis**
- Conducting beach and water safety assessments
- Prioritizing surf sites in the legislative aspect
  - **Regional or national surfing reserves**



# Future Applications

## Indicator Weighting Schema

Indicators can be assigned different weights based on surveys and one could compare the preferences and concerns of diverse stakeholder groups

$$SRSI_k = \sum_{j=1}^{n_k} I_{jk} w_{jk}$$

$I$  = individual indicators  
 $k$  = individual indices  
 $j$  = indicator within an index  
 $n$  = number of indicators  
 $w$  = applied indicator weights



# Future Applications

A reverse scale is applied to the Y axis to better illustrate the conservation priority

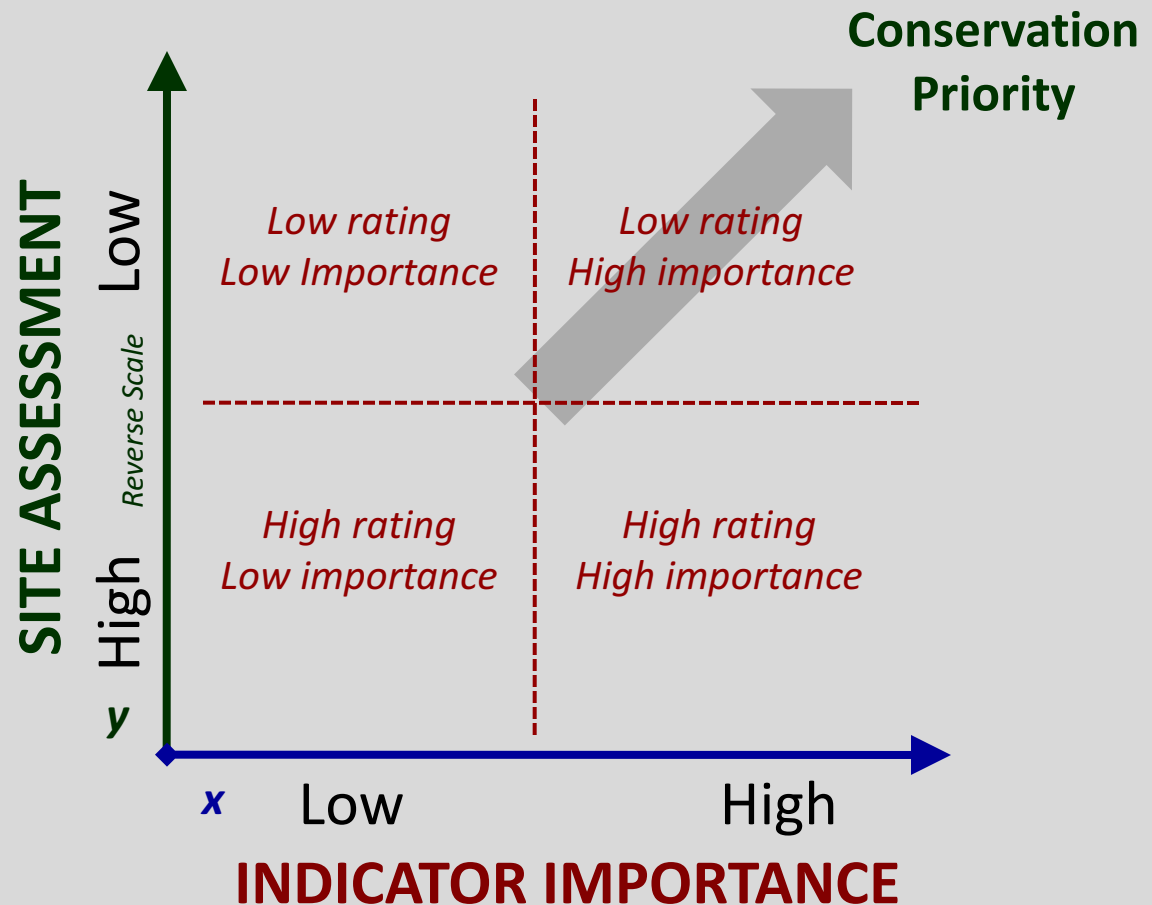
**Low rating**  
**High importance**  
*Urgent action needed*

**Low rating**  
**Low importance**  
*Action needed  
but not critical*

**High rating**  
**Low importance**  
*Preserve the  
site attributes*

**High rating**  
**High importance**  
*Sustain and closely monitor the site  
attributes*

## Conservation Action Matrix



# Future Application & Adaptations

## ■ San Diego State University (SDSU) **Center for Surf Research**

<http://csr.sdsu.edu/2012/11/14/steven-martin/>



- Further Index Development • Adaptation • SRSI Action Planning Guide
- Templates • Open Source for Public Use • SRSI Handbook • Best Practices

## ■ **Global Surf Cities Conference**

“World Surf Cities Network”

### **Gold Coast, Australia**

Requested for use by surf researchers  
and tourism organizations in **Australia**,  
**Brazil**, **Fiji** and **Spain**

### **Focus on developing an urban index**

- May emphasize economic indicators:

*“The sharpest tools in the shed”*

*Brad Farmer, National Surfing Reserves*

<http://www.businessgc.com.au/gold-coast-surf-conference-presentations>

# RECOMMENDATIONS

Assessment groups could produce extensive reports and reduce subjectivity

✚ SRSI Handbook  
✚ SRSI Action Planning Guide

- Coastal resource specialists, tourism academics, consultants, not-for-profit organizations, governments
- Involve in-depth discussion at the indicator level during field research

✚ Develop a rural index for developing countries  
✚ Develop and urban index for developed areas or countries



**NATIONAL  
SURFING  
RESERVES**

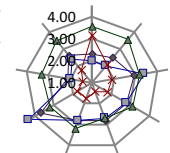


*Surfrider  
Foundation*



**SURFERS  
AGAINST  
SEWAGE**

**SRSI**



**SRSI**



## RECOMMENDATIONS

# SURFING RESERVES

- 🏄 Data-driven metrics can be used in the argument to protect surf sites
- 🏄 Data can be used to encourage policy makers
  - We must consider that most policy makers are not surfers

6 PHUKET GAZETTE

PHUKET NEWS

## Local beaches slated for surfing reserve shortlist

AT LEAST three surfing locations at Phuket beaches are being shortlisted for recognition as National Surfing Reserves (NSRs).

Brad Farmer, global chair of the non-profit organization National Surfing Reserves (NSR), conducted a site inspection at Kata, Kalim and Nai Yang Beaches on November 4.

"The surfing reserve concept is a symbolic dedication whereby surfing areas are recognized as coastal resources worthy of conservation; a reserve is essentially a badge of merit, a proactive endorsement to recognize iconic natural locations around the world," said Mr Farmer.

In / count gained, includ "B incom sense tribu such as... There are currently 14 NSRs in



Brad Farmer (right), the global chair of National Surfing Reserves (NSR), is seen with local environmentalists at Nai Yang Beach.

Australia, two in Hawaii and several more under review in the region, including in Indonesia, Sri Lanka, the Philippines and China.

"The creation of a surfing reserve in Thailand, the first in Asia, is a golden opportunity for Thai-

The SRSI global model springs from Thailand

"An applicable approach for the Andaman Coast of Thailand – potential to be the first in Asia"

...an observation on the Andaman Coast," said Steven Martin, a coastal researcher with Prince of Songkla University's Faculty of Environmental Management.

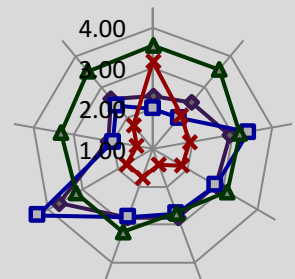
"Thailand is being considered for this distinction not only because of the natural beauty of its coastline but also because of its rich biodiversity and the unique surfing culture that has developed along its shores. The surfing reserve program is a way to protect these resources and ensure they are available for future generations."

has taken the initiative to visit Phuket and consider surf sites, such as Kata, Kalim and Nai Yang Beaches, for this internationally-recognized distinction," he added.



# Conclusion

- The modular SRSI approach offers a new set of metrics for measuring and understanding the conservation aptitude of coastal surfing resources from various standpoints
- SRSI systematically frames the surf site research process and the qualitative data generated through field work
- SRSI metrics can serve as qualitative and quantitative leveraging tools in a policy-driven argument for the sustainability and management of valuable and vulnerable coastal surfing resources and provide a global model for surf site conservation





# A Surf Resource Sustainability Index for Surf Site Conservation and Tourism Management

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2013