University of Victoria | Graduate Studies

Notice of the Final Oral Examination
for the Degree of Doctor of Philosophy

of

PETCH MANOPAWITR

MASc (James Cook University, 2001)
BSc (Kasetsart University, 1995)

"Vulnerability, Resilience and Conservation Strategies for Thailand's Coral Reefs Marine Protected Areas in a Changing Climate"

Department of Geography

Wednesday, December 18, 2019
4:30 P.M.
Clearihue Building
Room B007

Supervisory Committee:
Dr. Philip Dearden, Department of Geography, University of Victoria (Supervisor)
Dr. Ellen Hines, Department of Geography, UVic (Member)
Dr. Kenneth MacKay, Vonu Environmental Consulting (Outside Member)

External Examiner:
Dr. Suchana Apple Chavanich, Department of Marine Science, Chulalongkorn University

Chair of Oral Examination:
Dr. Ana Maria Peredo, School of Environmental Studies, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies

Abstract

In 2010, Thailand's Andaman Sea experienced unprecedented mass coral bleaching. Approximately, 50-90% of corals suffered bleaching throughout the reef areas along the Andaman coast both inside and outside Marine Protected Areas (MPAs). This dissertation examines the implications of climate change for coral reef ecosystems and resilience concepts. This study explores the potential and effectiveness of conservation management strategies using MPAs and resilience building to address this global challenge in the context of Thailand.

This dissertation examines how resilience-based management can be enhanced in Thailand's MPAs on the Andaman coast in the face of climate change. In particular the research 1) identified resilient reefs in the Andaman bioregion, 2) assessed coral reef resilience in a specific MPA to identify management interventions, 3) examined current MPA coverage and suggested strategies to improve coverage, and 4) illustrated the potential of social media to enhance coral reef resilience in Thailand.

This study employed a mixed methods approach consisting of literature review, a review of available secondary data, workshops, field surveys and social media data tracking. Twenty-two resilience indicators were selected and used to assess Thai reefs at 62 survey stations across the Andaman bioregion. A review of existing Andaman MPA coverage, spacing and design was conducted to determine the gaps and opportunities for expanding the MPA network. A science communication campaign focused on the importance of parrotfish in saving coral reefs using online social media was launched and monitored.

The study sites were classified into high (28), moderate (23) and low (11) resilience based on resilience scores. The results provide the first comprehensive resilience assessment of coral reefs in the Andaman sea. The identified resilient reef areas serve as cornerstones in developing a more resilient MPA network and provide a conservation-based platform for long-term marine spatial planning in the Andaman region.

Resilience scores for Mu Ko Surin National Park were analyzed in more detail to provide an example of the process of undertaking a finer scaled analysis with a localized weighting system. Management interventions were developed accordingly including strict protection areas and recovery zone designations aiming to improve coral resilience.

Expanding MPA coverage and developing MPA networks is an urgent priority for Thailand to reach the CBD target of at least 10% of marine and coastal habitat protected by 2020. This study suggests three important areas for consideration: 1) Expanding MPAs by prioritizing resilient areas and incorporating other types of conservation areas; 2). A ‘bottom-up’ approach that incorporates adaptive and flexible governance; and 3) Adaptive management to address key shortcomings of current MPAs.

The findings from the parrotfish campaign highlight the importance of science communication and the usefulness of social networks for conservation. It demonstrates that social media, when used properly and effectively, is powerful for public engagement and helps create an enabling environment for change in public policy and practice for marine conservation.

This dissertation offers insights into opportunities to improve the management of large tropical marine ecosystem and how coral reef resilience can be enhance by developing MPA networks in the face of climate change.