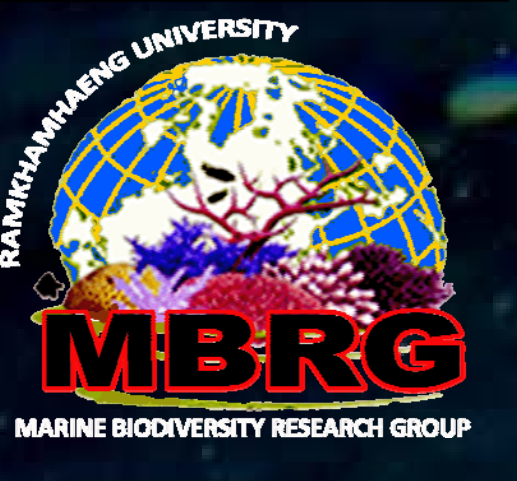


Ocean Acidification: a New Concern for Marine Policy in Thailand



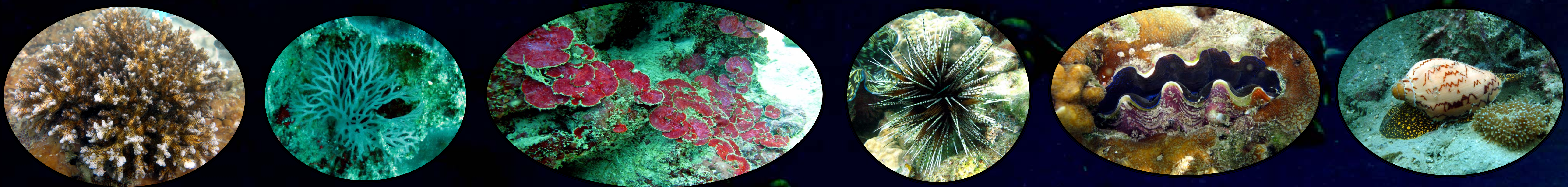
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Summary

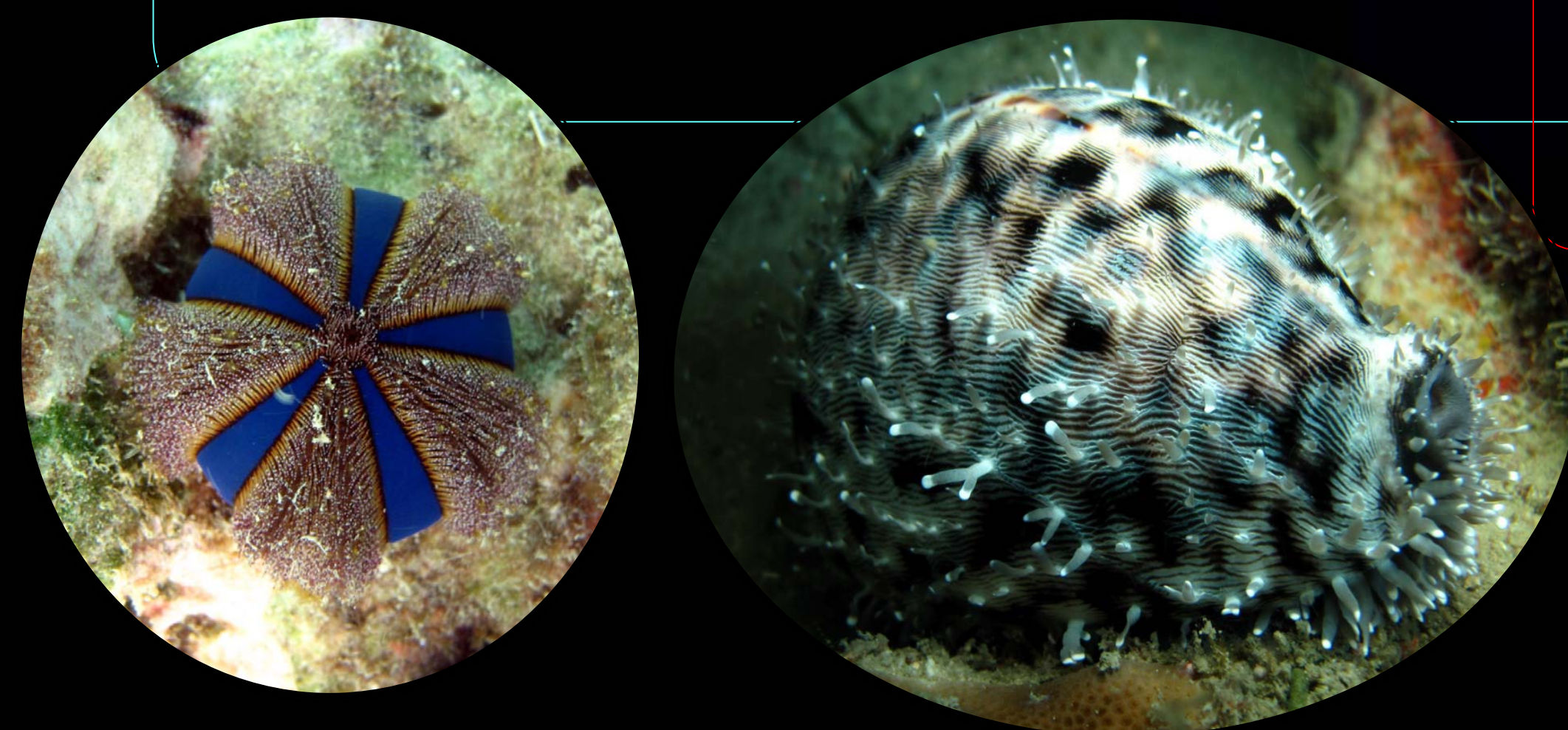
Marine ecosystem responses to ocean acidification are very complex and require knowledge of impacted marine processes and trophic interactions. This paper emphasizes on a challenge of ocean acidification in Thai coral reefs and its implication for marine and coastal planning. It is recognized that the ecological impact of ocean acidification resulting from the anthropogenic emissions of carbon dioxide is a relatively new concern for scientists and managers however it is important to increase research effort. Our current scientific data show that ocean acidification can be a serious threat to the marine ecosystem, biodiversity, biogeochemical cycles and ecosystem services. Based on some important literatures on coral reef management with focusing on ocean acidification, especially from the International Coral Reef Initiative (ICRI) recommendation on acidification and coral reefs, the International Society for Reef Studies (ISRS): briefing paper 5-coral reef and ocean acidification, the Honolulu declaration on ocean acidification and reef management and the Monaco declaration, a variety of coral reef research aspects, including extremely basic data collection as well as sophisticated laboratory and modeling applications, are required. The research aspects include quantification of the spatial and temporal variations in coral reef carbonate budgets, studies of the impacts of reduced calcification on organisms and ecological processes and determination of the calcification mechanisms across various calcifying taxa. As limited research funding and man-power, an overarching need is to establish cross-disciplinary and cross-institutional collaborations that will minimize duplication of research and allow efficient research planning to cope with ocean acidification. Management strategies in Thailand should focus on reducing all stresses on coral reefs as much as possible to enhance their health and resilience, designing and management of marine protected area networks to address ocean acidification impacts, integrating coral reef management with land-use and coastal zone planning and practices to reduce pollutant inputs, developing a coordinated international network of monitoring stations to map the vulnerability of coastal areas to ocean acidification at scales relevant to managers, integrating acidification data into existing accessible data management systems, developing educational and informational materials to communicate the implications of ocean acidification for reef ecosystems and dependent communities emphasizing response actions, linking between economists and scientists that are needed to evaluate the socioeconomic extent of impacts and costs for action versus inaction and improving communication between policy makers and scientists. It is necessary to have mechanisms for implementation of projects and activities concerning ocean acidification as well as coral bleaching under the national coral reef management plan which should include establishing a coral reef committee for policy determination, support and evaluation of projects or activities concerning prevention and mitigation of coral reef degradation (under the National Environment Board) and providing regular reports on coral reef status and problems to the cabinet and asking them to command relevant government agencies about implementation of the proper projects.



Relevant Strategies and Management Plans

Policies, Measures and Plans for Conservation and Utilization of Sustainable Biodiversity B.E 2551-2555

- Reservation of biodiversity components
- Support sustainable utilization of biodiversity
- Reduction of threats on biodiversity
- **Impacts of Global Climate Change on Coral Reef Ecosystem and Measures for Coral Reef Restoration in Thai Waters**
- Support research, training, public awareness and network concerning biodiversity
- Capacity building for Thailand concerning activities under the international agreement of biodiversity



Strategies to Cope with Global Warming and Climate Change through Application of Science and Technology

- Development of climate change models
- Prediction of impacts and adaptation for climate change
- Measures for reduction of green house gas emission

Acknowledgements:

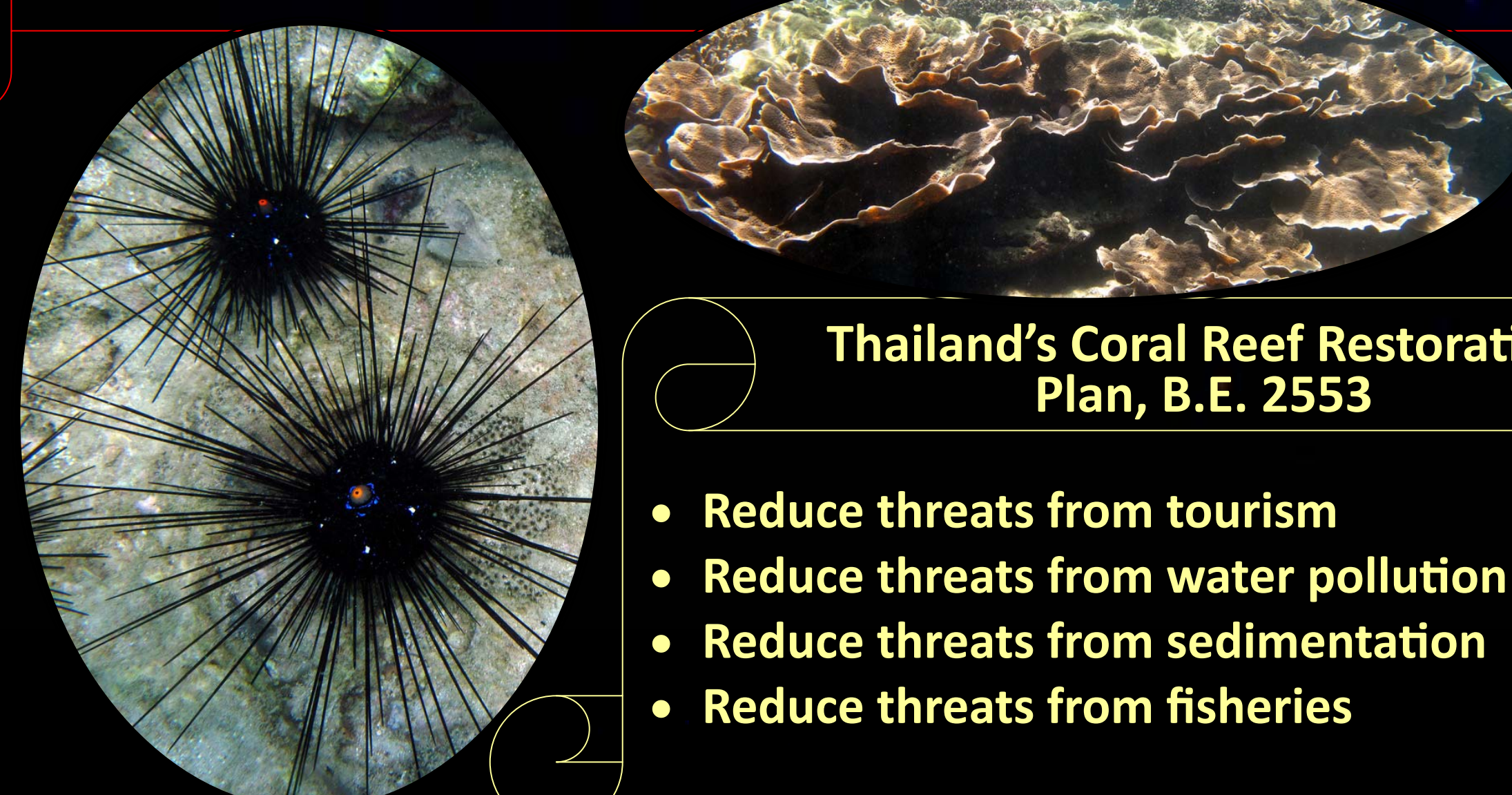
This study was supported by a budget for research promotion from Thai Government in the fiscal years B.E. 2552-2555. Staff of the Marine Biodiversity Research Group assisted field works.

Strategic Plan for National Environmental Health

- Plan for air quality and healthy water resources
- Plan for solid, toxic wastes, toxins and hazardous substances
- **Plan for climate change, atmospheric ozone depletion and ecosystem change**
- Plan for preparation of emergency assistance

Strategies for Solving Energy Problems

- Reduction of total energy uses
- Increase proportion of alternative energy sources
- Increase efficiency of energy uses in various sectors
- Support operation in accordance with mechanisms for clean energy development



Thailand's Coral Reef Restoration Plan, B.E. 2553

- Reduce threats from tourism
- Reduce threats from water pollution
- Reduce threats from sedimentation
- Reduce threats from fisheries

A National Coral Reef Strategy: Policies and Action Plans, 3rd March B.E. 2535

- Manage coral reefs according to different ecological and economic values to maintain a balance of uses
- Reduce reef degradation by increasing the effectiveness of existing laws, management plan and application of appropriate technology
- Build and maintain strong and broad public support
- Revise Royal Thai Government legal, regulatory, and institutional framework
- Monitor and evaluate progress
- Support management through scientific research and innovation

Management Plan for Environmental Quality B.E. 2550-2554

- Maintenance of resources and healthy ecosystems
- Integrated management of various resources
- Prevention and mitigation of disasters
- Maintenance and restoration of environmental quality
- **Enhancing capacity of institutions and human resources concerning climate change**
- Determination of criteria and processes in accordance with mechanisms of clean development
- Increase efficiency of greenhouse gas reduction



National Strategies for Climate Change B.E. 2551-2555

- Capacity building for adaptation to cope with risks of climate change impacts
- Support reduction of green house gas emission and increase areas for gas absorption on the sustainable development basis
- Support research and development for understanding of climate change
- Raising public awareness and participation on solving of climate change problems
- Enhancing capacity of human resources and Institutions concerning climate change operation
- Development of processes for cooperation with foreign countries