CBD Biodiversity Research in Thailand

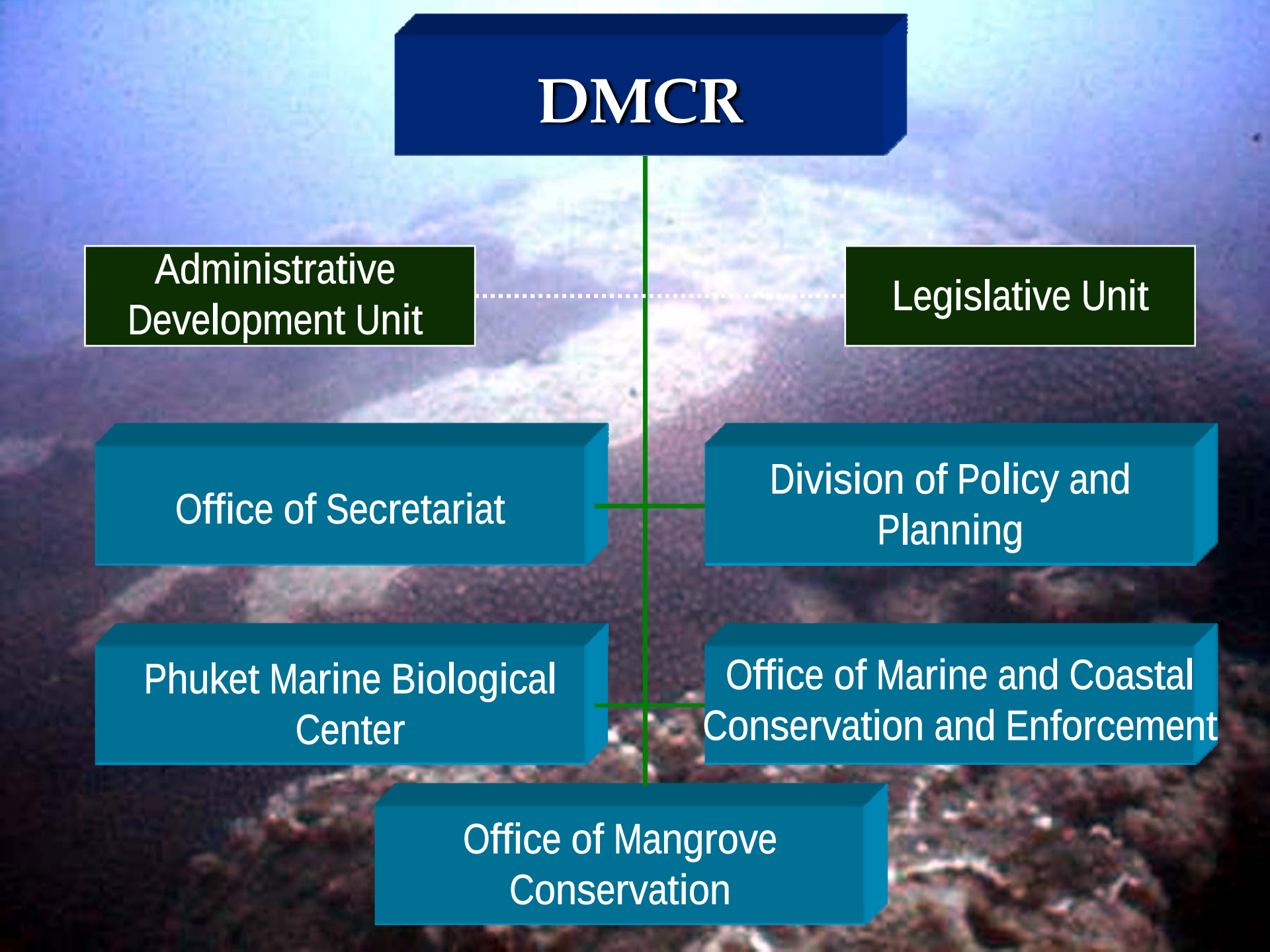
Somchai BUSSARAWIT
Phuket Marine Biological Center
Department of Marine and Coastal Resources
Ministry of Natural Resources and Environment

Department of Marine and Coastal Resources

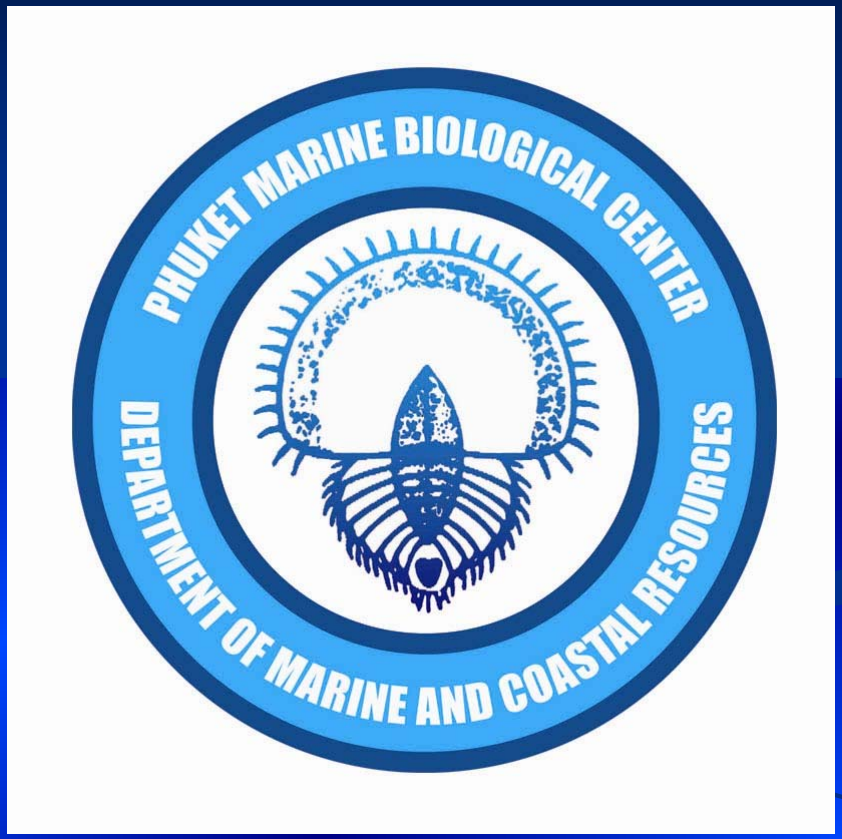
Ministry of Natural Resources and Environment

VISION

- Conserve, restore, and manage marine and coastal resources so that their beutiful wealth can support and sustain the socio-economic strength of the country


DMCR
Administrative Development Unit
Legislative Unit
Office of Secretariat
Division of Policy and Planning
Phuket Marine Biological Center
Office of Marine and Coastal Conservation and Enforcement
Office of Mangrove Conservation

Phuket Marine Biological Center



Department of Marine and Coastal Resources

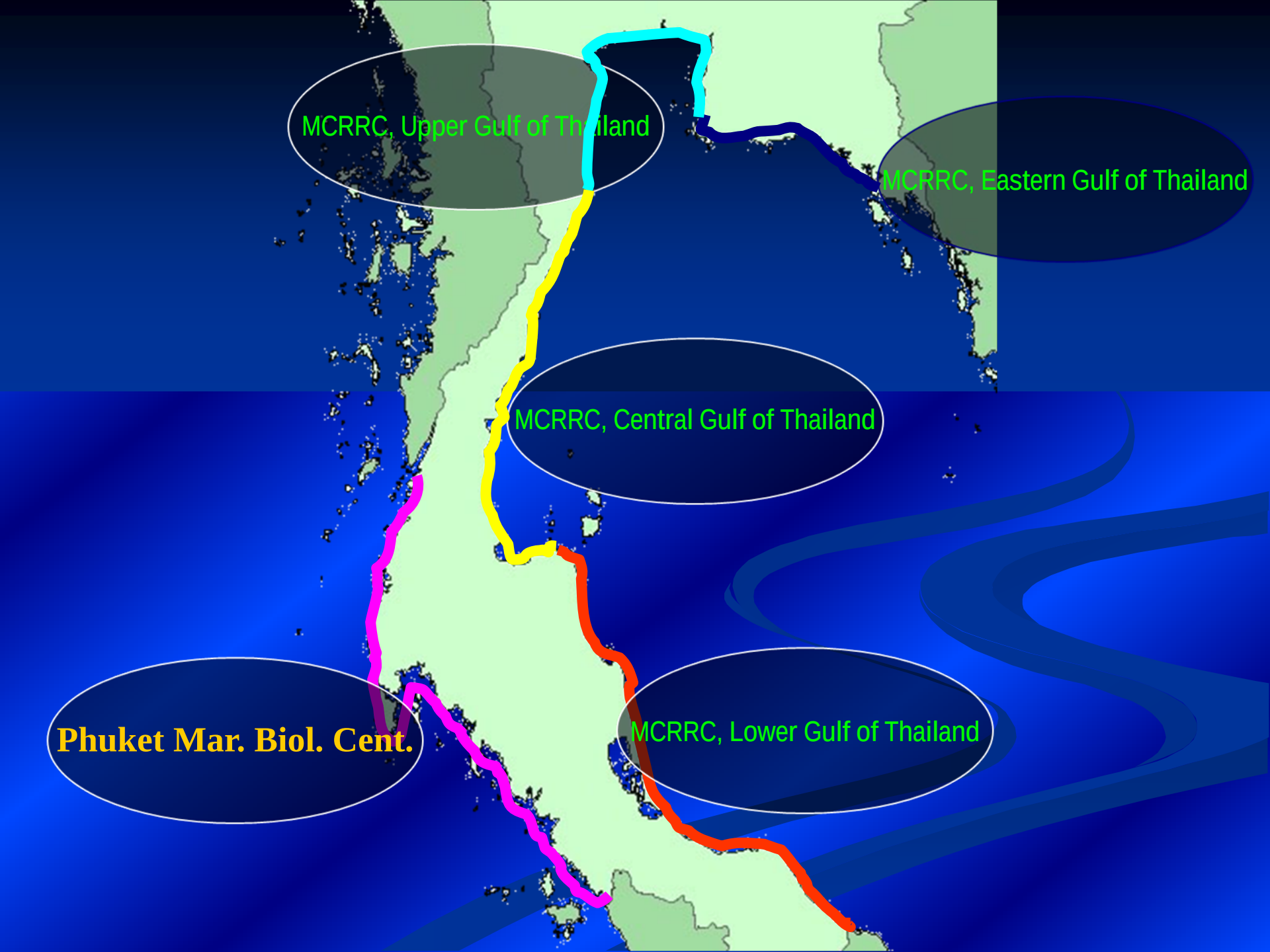
Ministry of Natural Resources and Environment

Established since 11 October 1968 under a bilateral agreement between the governments of Thailand and Denmark after the 5th Thai-Danish Expedition in the Andaman Sea

PMBC was officially opened on May 11, 1972

Mission

- To carry out research and assessment of abundance of marine and coastal resources together with the state of the environment in Thai waters
- To carry out research and development of applicable techniques for rehabilitation of degraded marine and coastal habitats
- To support all relevance aspects regarding sustainable uses and management of marine and coastal resources
- To promote public education and awareness about conservation of marine resources and environment


MCRRC, Upper Gulf of Thailand
MCRRC, Eastern Gulf of Thailand
MCRRC, Central Gulf of Thailand
Phuket Mar. Biol. Cent.
MCRRC, Lower Gulf of Thailand

Research on marine resources

Activities

Status assessment and monitoring of coastal marine habitats

Survey and monitoring of coral reefs

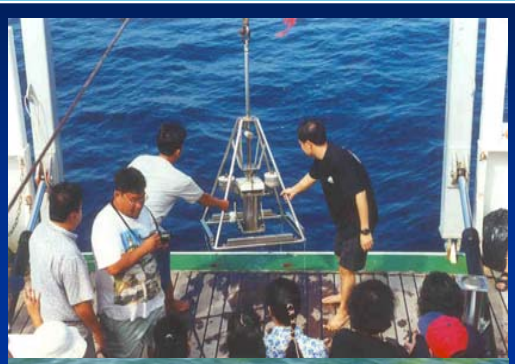
Survey and monitoring of seagrass beds

Research on mangrove ecosystem

Biological production and ecological functioning

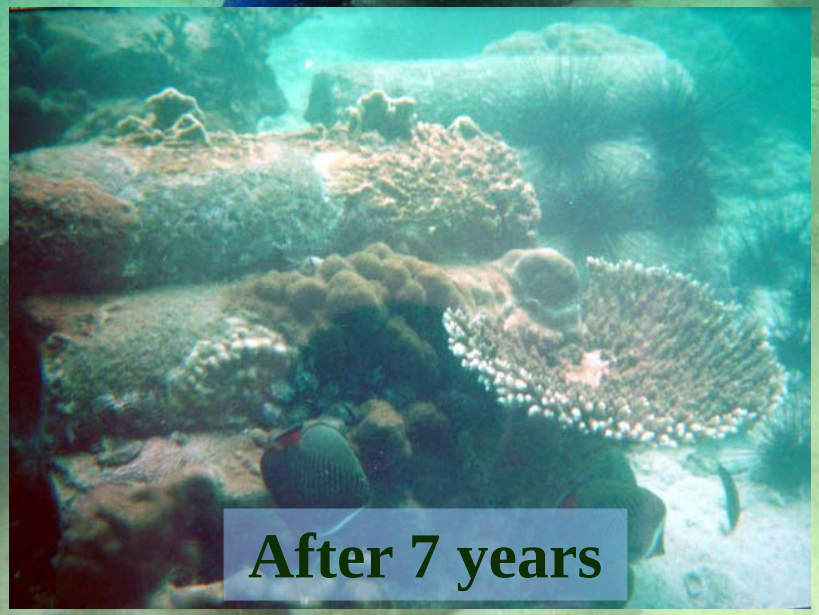
Research on marine endangered species

Research on physical and chemical oceanography

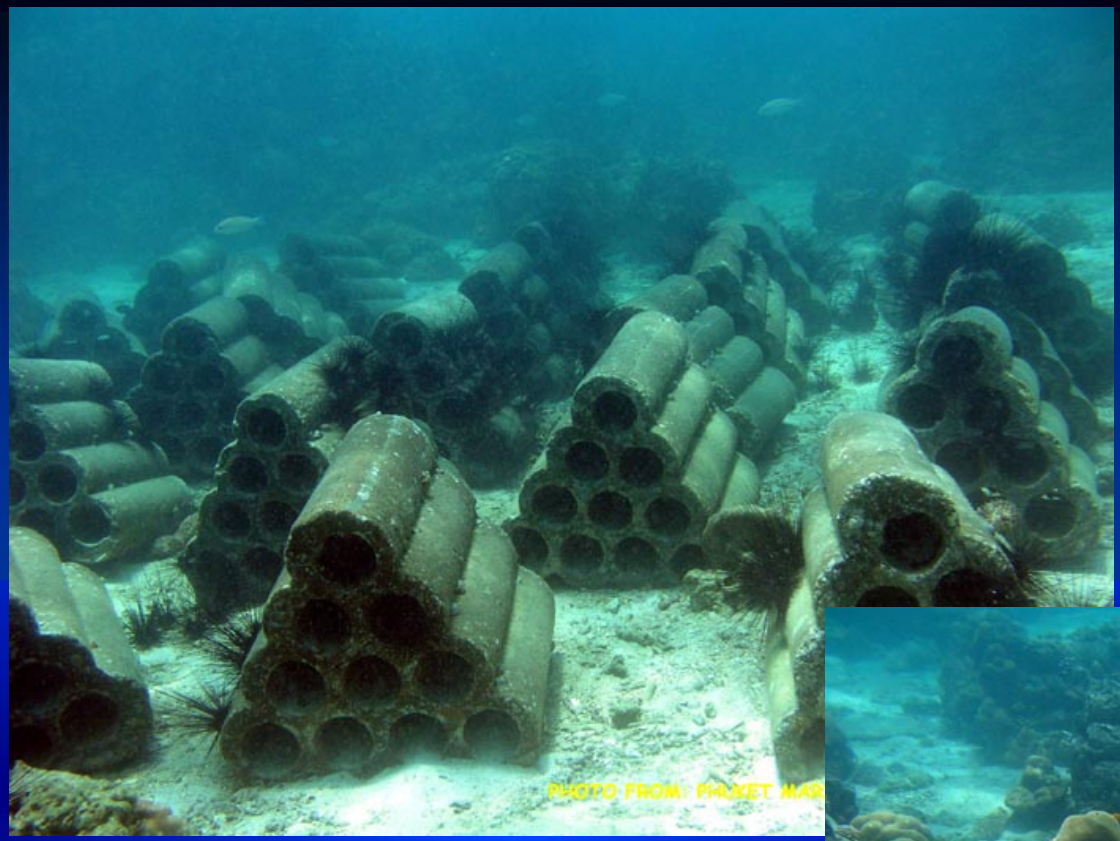


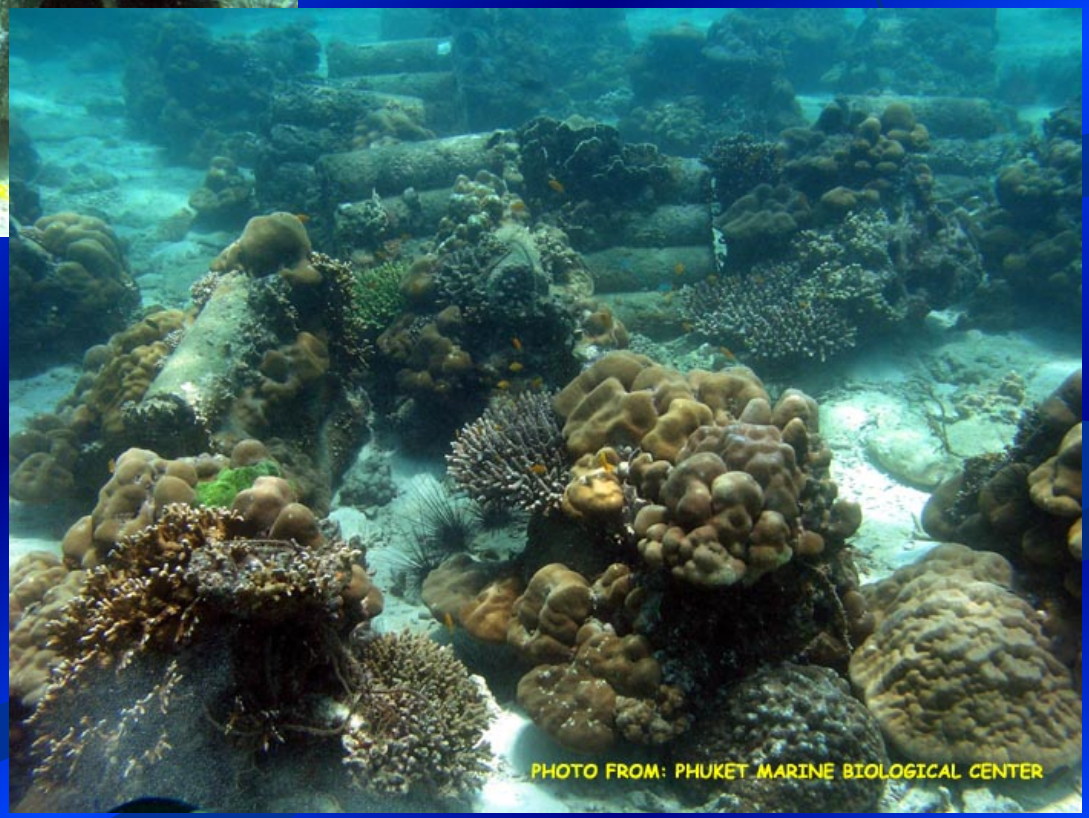
Monitoring of marine environment and pollution

Research and development on techniques for restoration of degraded marine resources



Monitoring of coral recruitment and faunal communities on artificial substrate manipulated for coral-reef restoration





Corals nursery

Restoration of giant clam population

Capacity building through conducting training courses and workshops

Awareness building on conservation of marine resources and environment (e.g. for general public and school students)

Reference Collection

Collection of flora and fauna :

> 200,000 specimens (about 5,000 species have been registered and catalogued)

Including 140 new holotypespecies from the Andaman Sea

PMBC / DANIDA
INTERNATIONAL WORKSHOP
ON THE BIODIVERSITY OF CRUSTACEA
IN THE ANDAMAN SEA
AT PHUKET MARINE BIOLOGICAL CENTER
29 NOV. -
1998

PHUKET MARINE BIOLOGICAL CENTER SPECIAL PUBLICATION

Proceedings of the International Workshop on the Crustacea of the Andaman Sea

Part 1

Phuket Marine Biological Center, Department of Fisheries, Thailand,

29 November – 20 December 1998

A Thai – Danish Scientific Cooperation Program

PHUKET MARINE BIOLOGICAL CENTER SPECIAL PUBLICATION

Proceedings of the International Workshop on the Crustacea of the Andaman Sea

Part 2

Phuket Marine Biological Center, Department of Fisheries, Thailand,

29 November – 20 December 1998

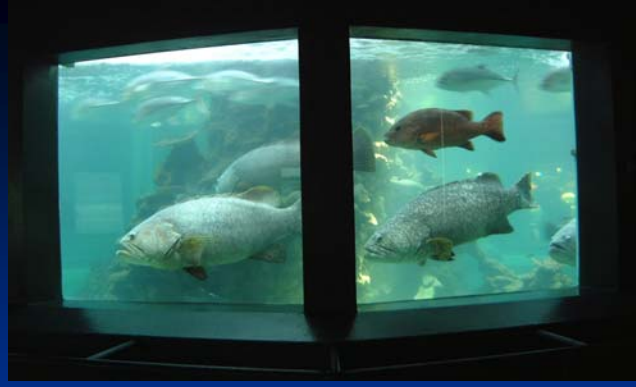
A Thai – Danish Scientific Cooperation Program

Deep Water Fauna in the Andaman Sea

New species

New records

Phuket Aquarium



Its key roles in promoting tourism as well as public education

Scientific information services

Data-base and GIS

Library

Scientific publications

R/V Boonlert Phasuk (21.7 m, GT 60)

Chakratong Tongyai R/V (38.4 m; GT 464) provided by Danish Government in 1995

Marine Protected Areas

Ten of the Most Unwanted

Marine plants, animals and microbes are being carried around the world attached to the hulls of ships and in ships' ballast water. When discharged into new environments, they may become invaders and seriously disrupt the native ecology and economy. Introduced pathogens may cause diseases and death in humans.

Cholera

Vibrio cholerae (various strains)

Native to: Various strains with broad ranges.

Introduced to: South America, Gulf of Mexico and other areas.

Impacts: Some cholera epidemics appear to be directly associated with ballast water. One example is an epidemic that began simultaneously at three separate ports in Peru in 1991, sweeping across South America, affecting more than a million people and killing more than ten thousand by 1994. This strain had previously been reported only in Bangladesh.

North American Comb Jelly

Mnemiopsis leidyi

Native to: Eastern Seaboard of the Americas

Introduced to: Black, Azov and Caspian Seas

Impacts: Reproduces rapidly (self fertilising hermaphrodite) under favourable conditions. Feeds excessively on zooplankton. Depletes zooplankton stocks; altering food web and ecosystem function. Contributed significantly to collapse of Black and Asov Sea fisheries in 1990s, with massive economic and social impact. Now threatens similar impact in Caspian Sea.

Cladoceran Water Flea

Cercopagis pengoi

Native to: Black and Caspian Seas

Introduced to: Baltic Sea

Impacts: Reproduces to form very large populations that dominate the zooplankton community and clog fishing nets and trawls, with associated economic impacts.

North Pacific Seastar

Asterias amurensis

Native to: Northern Pacific

Introduced to: Southern Australia

Impacts: Reproduces in large numbers, reaching 'plague' proportions rapidly in invaded environments. Feeds on shellfish, including commercially valuable scallop, oyster and clam species.

Mitten Crab

Eriocheir sinensis

Native to: Northern Asia

Introduced to: Western Europe, Baltic Sea and West Coast North America

Impacts: Undergoes mass migrations for reproductive purposes. Burrows into river banks and dykes causing erosion and siltation. Preys on native fish and invertebrate species, causing local extinctions during population outbreaks. Interferes with fishing activities.

Zebra Mussel

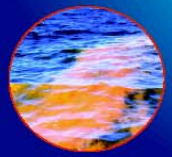
Dreissena polymorpha

Native to: Eastern Europe (Black Sea)

Introduced to: Western and northern Europe, including Ireland and Baltic Sea; eastern half of North America

Impacts: Fouls all available hard surfaces in mass numbers. Displaces native aquatic life. Alters habitat, ecosystem and food web. Causes severe fouling problems on infrastructure and vessels. Blocks water intake pipes, sluices and irrigation ditches. Economic costs to USA alone of around US$750 million to $1 billion between 1989 and 2000.

Toxic Algae (Red/Brown/Green Tides)



Various species

Native to: Various species with broad ranges.

Introduced to: Several species have been transferred to new areas in ships' ballast water.

Impacts: May form Harmful Algae Blooms. Depending on the species, can cause massive kills of marine life through oxygen depletion, release of toxins and/or mucus. Can foul beaches and impact on tourism and recreation. Some species may contaminate filter-feeding shellfish and cause fisheries to be closed. Consumption of contaminated shellfish by humans may cause severe illness and death.

Asian Kelp

Undaria pinnatifida

Native to: Northern Asia

Introduced to: Southern Australia, New Zealand, West Coast of USA, Europe and Argentina

Impacts: Grows and spreads rapidly, both vegetatively and through dispersal of spores. Displaces native algae and marine life. Alters habitat, ecosystem and food web. May affect commercial shellfish stocks through space competition and alteration of habitat.

Round Goby

Neogobius melanostomus

Native to: Black, Asov and Caspian Seas

Introduced to: Baltic Sea and North America

Impacts: Highly adaptable and invasive. Increases in numbers and spreads quickly. Competes for food and habitat with native fishes including commercially important species, and preys on their eggs and young. Spawns multiple times per season and survives in poor water quality.

European Green Crab

Carcinus maenus

Native to: European Atlantic Coast

Introduced to: Southern Australia, South Africa, USA and Japan

Impacts: Highly adaptable and invasive. Resistant to predation due to hard shell. Competes with and displaces native crabs and becomes a dominant species in invaded areas. Consumes and depletes wide range of prey species. Alters inter-tidal rocky shore ecosystem.

Further Information:

Global Ballast Water Management Programme
International Maritime Organization, London, UK
Fax +44 (0)20 7587 3261
Web http://globallast.imo.org

Photo credits: *Ship Discharging Ballast Water* – CRIMP, CSIRO Marine Research, Australia; *Zebra Mussel* – Sergei Olenin; *Cladoceran Water Flea* – Mirja Rosenlang; *Cholera* – Gloria Casale; *Comb Jelly* – Richard Harbison; *Asian Kelp & North Pacific Seastar* – CSIRO Australia; *European Green Crab* – T. Huspeni; *Toxic Algae* – D.A. Hentman; *Mitten Crab* – Stephan Gollasch; *Round Goby* – David Jude

Concept, content and design: Steve Raaymakers and Liz Gould (design@lizgould.plus.com)

The species presented here are for illustrative purposes only. Their introduced ranges may be greater than depicted. There are numerous other examples of serious marine bio-invasions around the world.

Global Ballast Water Management Programme

GEF undp imo

Invasive Alien Species

Mytilopsis sallei

Liptopenaeus vannami

Invasive Alien Species
Positive Anticancer

Ecteinascidia thurstoni **Herdman, 1891**

National Taxonomic Needs Assessment

Capacity Building on Information

- Needs for additional human resources for data collection and programmers for building taxonomic database
- Need for the establishment of taxonomic information network
- Needs for organizing meeting to exchange views/information on taxonomy
- Need for specialists

Status of Taxonomists

- Needs for para–taxonomists
- Needs for collection facilities
- Needs for taxonomic laboratories
- Equipment/instruments needs for collecting specimens
- Equipment/instruments needs for specimen classification
- Equipment/instruments needs for data collection
- Needs for vehicles
- Needs for funding for taxonomic works

Types of Collections in Relevant Institutions

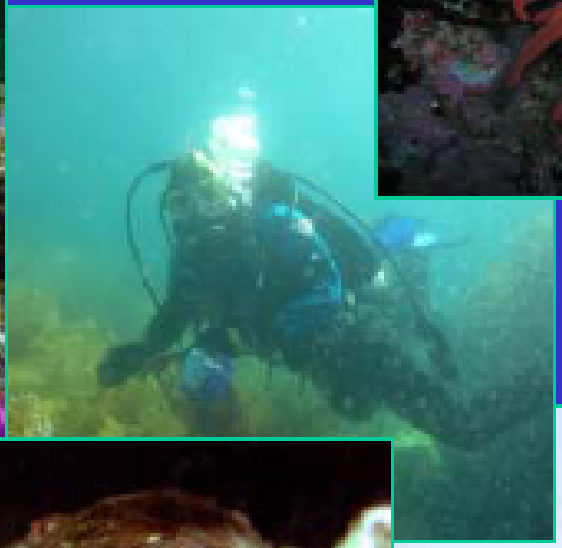
55 institutions had been assigned to collect taxonomic specimens. These institutions include 7 herbariums, 2 botanical gardens, 13 zoological museums (and aquariums), 6 germplasm collection centers, 1 gene bank, 8 agencies where collections are carried out by individual researchers and 18 institutions where there is more than one type of collections

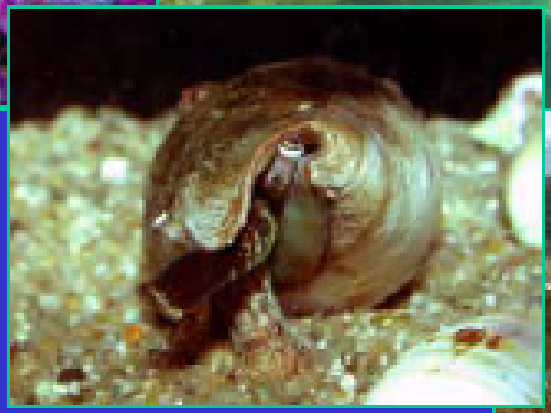
Global Taxonomic Initiatives

JSPS/NaGISA coordinator meeting

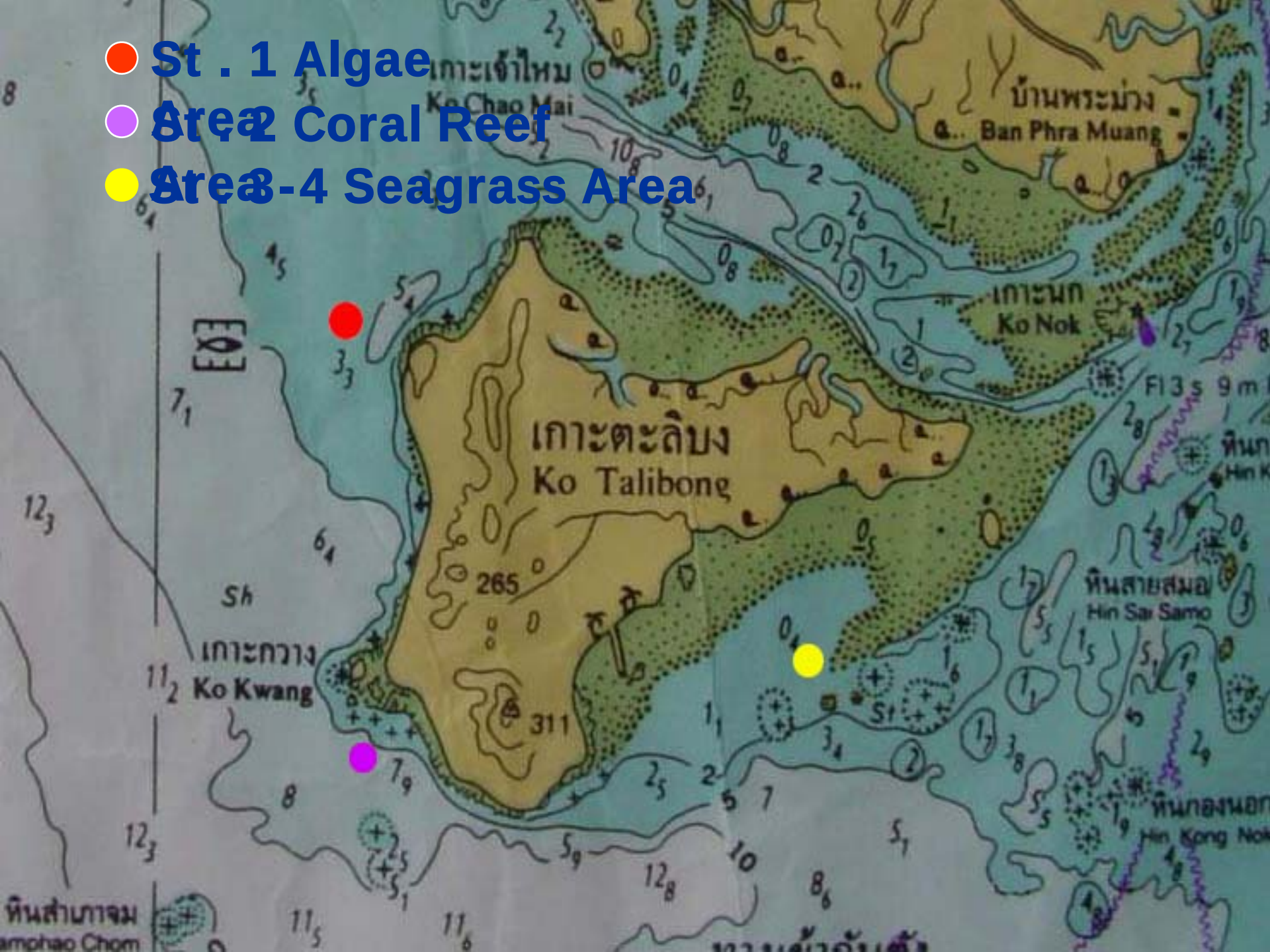
Natural Geography In Shore Areas

A Census of Marine Life Field Project



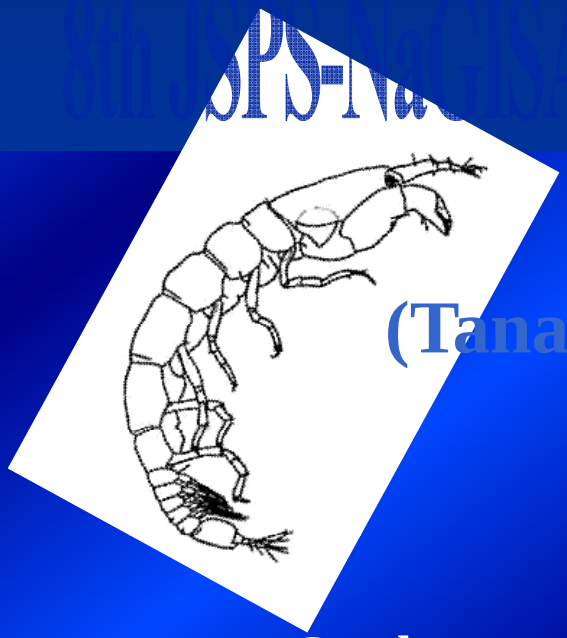


Produced by Seto Marine Biological Laboratory, Field Science Education & Research Center, Kyoto University


St . 1 Algae
Area 2 Coral Reef
Area 3-4 Seagrass Area
เกาะเจ้าไหม
Ko Chao Mai
บ้านพระม่วง
Ban Phra Muang
เกาะนก
Ko Nok
เกาะตะลิบง
Ko Talibong
265
311
เกาะกวาง
Ko Kwang
หินสายสมอ
Hin Sai Samo
หินกองนอก
Hin Kong Nok
หินสำเภาจม
Fl 3 s 9 m

training course on meiofauna
GTI project
28 - 30 october 2002
Marine Camp
TOP TIP

8th JSPS-NaGISA-UPV Taxonomy Training Workshop



(Tanaidacea & Harpacticoida)

September 26-28, 2007

Graduate and Continuing Education Bldg. (GCEB)
University of the Philippines in the Visayas
Iloilo City, Philippines

WELCOME PARTICIPANTS
JSPS-NaGISA WESTPAC BIVALVE TAXONOMY
TRAINING WORKSHOP
March 8- 10, 2009
Universiti Sains Malaysia
Penang
NaGISA
日本財団
USM

Welcome Participants
JSPS-NaGISA Western Pacific Sponge Taxonomy Training Workshop
May31-June2,2009
Burapha University, Chon-Buri, Thailand
NaGISA
CENSUS OF MARINE LIFE

Diversity in vertebrates species

Thailand has approximately 4,591 species of vertebrates, including

- 302 species of mammals from the Malayan Peninsula, Indochinese and Indian sub-regions, and other parts of the Asian continent
- 982 species of birds
- 350 species of reptiles (366 forms)
- 137 species of amphibians (138 forms)
- at least 2,820 species of fish

Census of Marine Life

A decade-long program (2000-2010)

to assess and explain marine life's

diversity, distribution & abundance

- past, present & future

The Known, the Unknown, the Unknowable

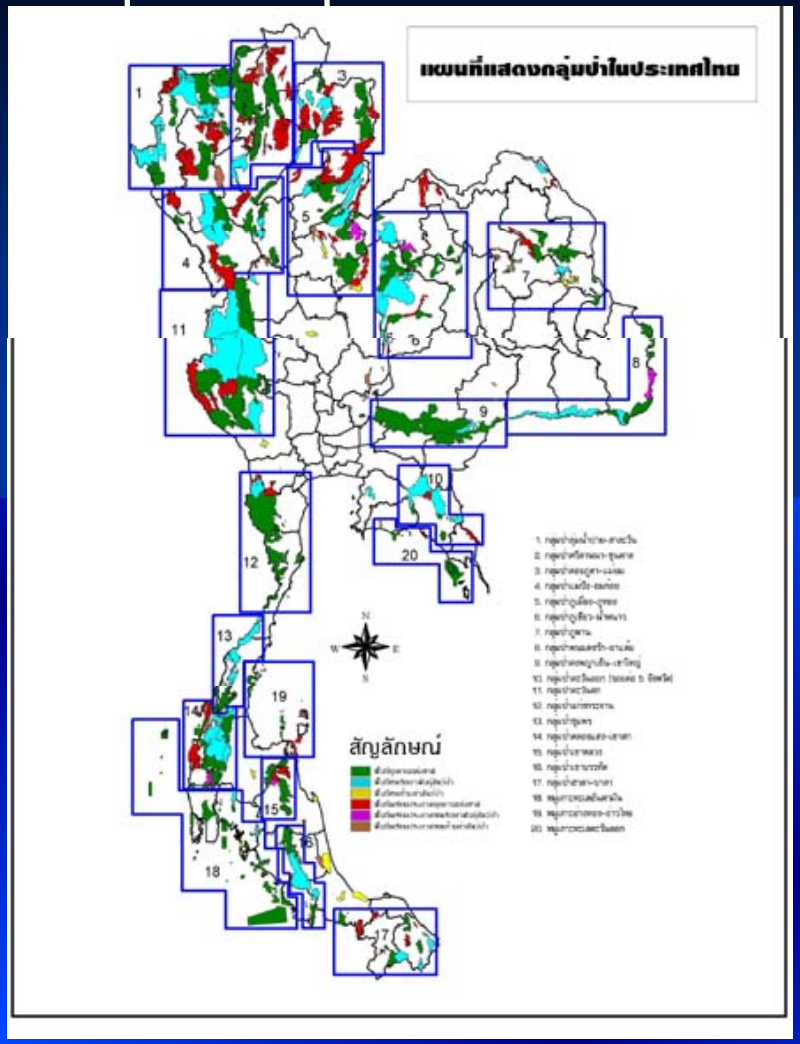
The Census of Marine Life: Making ocean life count

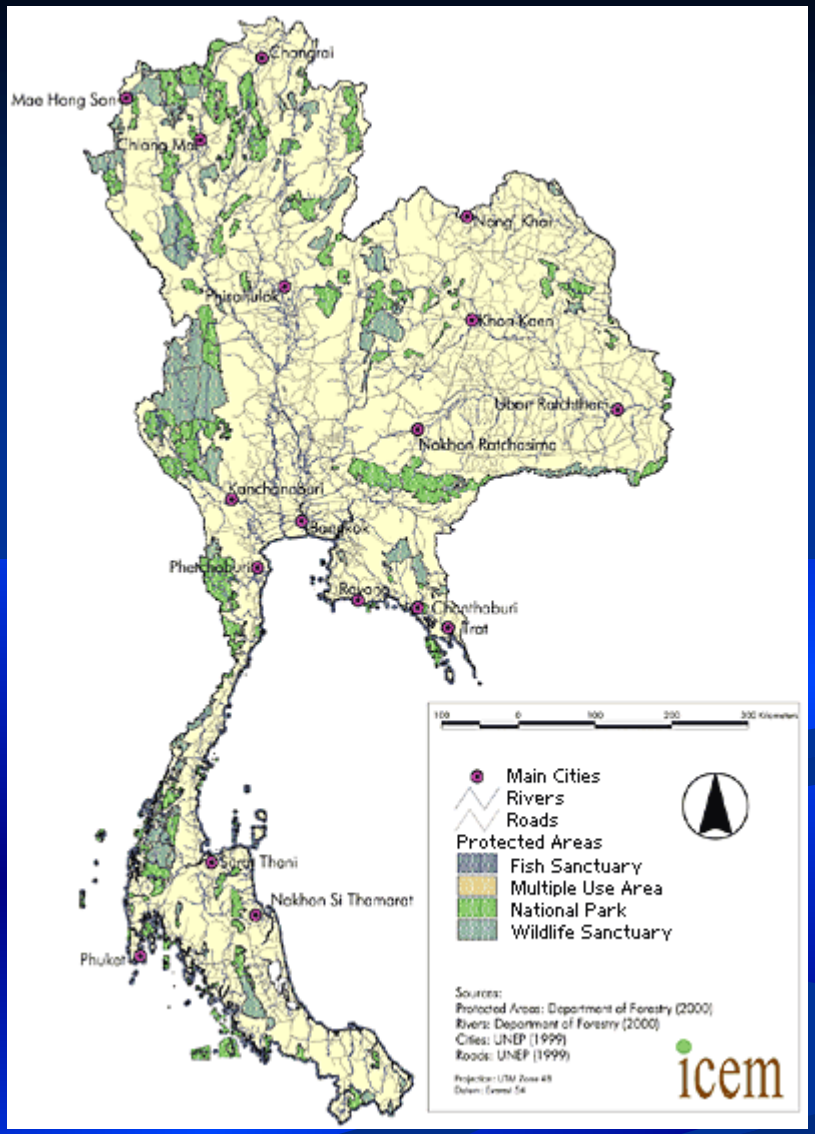
A program of exploration and applications

Applications:

- Sustainable Fisheries
- Marine Protected Areas (finding hotspots)
- Habitat Loss and Pollution
- Environmental Assessments
- Invasive Species
- Endangered Species
- UN Convention on Biodiversity
- Global Climate Change

Maps of protected areas





Forest complex and protected areas in Thailand

The range of terrestrial ecosystems

- moist evergreen forests
- hill evergreen forests
- dry evergreen forests
- pine forests
- mixed deciduous forest
- dry evergreen forests
- grasslands

The freshwater ecosystems

- rivers
- reservoirs
- swamps
- ponds
- fresh swamp forests
- peat swamp forests

The range of coastal ecosystems
(2,631 km. coastline and surrounding 594 islands)

- beach Forests
- mangrove forests
- sandy beaches
- mudflats
- rocky shores
- sea grass
- coral reefs

Diversity in plant species.

- Thailand can be considered as a collective center of floristic elements consisting of Indo-Burmese, Indo-Chinese and Malesian elements
- Approximately 12,000 vascular plant species in Thailand, including 658 species of pterophyte, 25 species of gymnosperm and approximately 10,000 species of angiosperm, including over 1,140 species of orchids.
- More than 2,154 non-vascular plant species in Thailand, including algae and bryophytes, i.e. moss, hornwort, and liverwort.

Diversity in invertebrate species

The country has approximately 83,000 invertebrate species, of which 14,000 species can be identified.

Diversity in vertebrates species

Thailand has approximately 4,591 species of vertebrates, including

- 302 species of mammals from the Malayan Peninsula, Indochinese and Indian sub-regions, and other parts of the Asian continent
- 982 species of birds
- 350 species of reptiles(366 forms)
-137 species of amphibians (138 forms)
-at least 2,820 species of fish

Number of Vertebrate Species in Thailand (Endemic and Threatened Species)

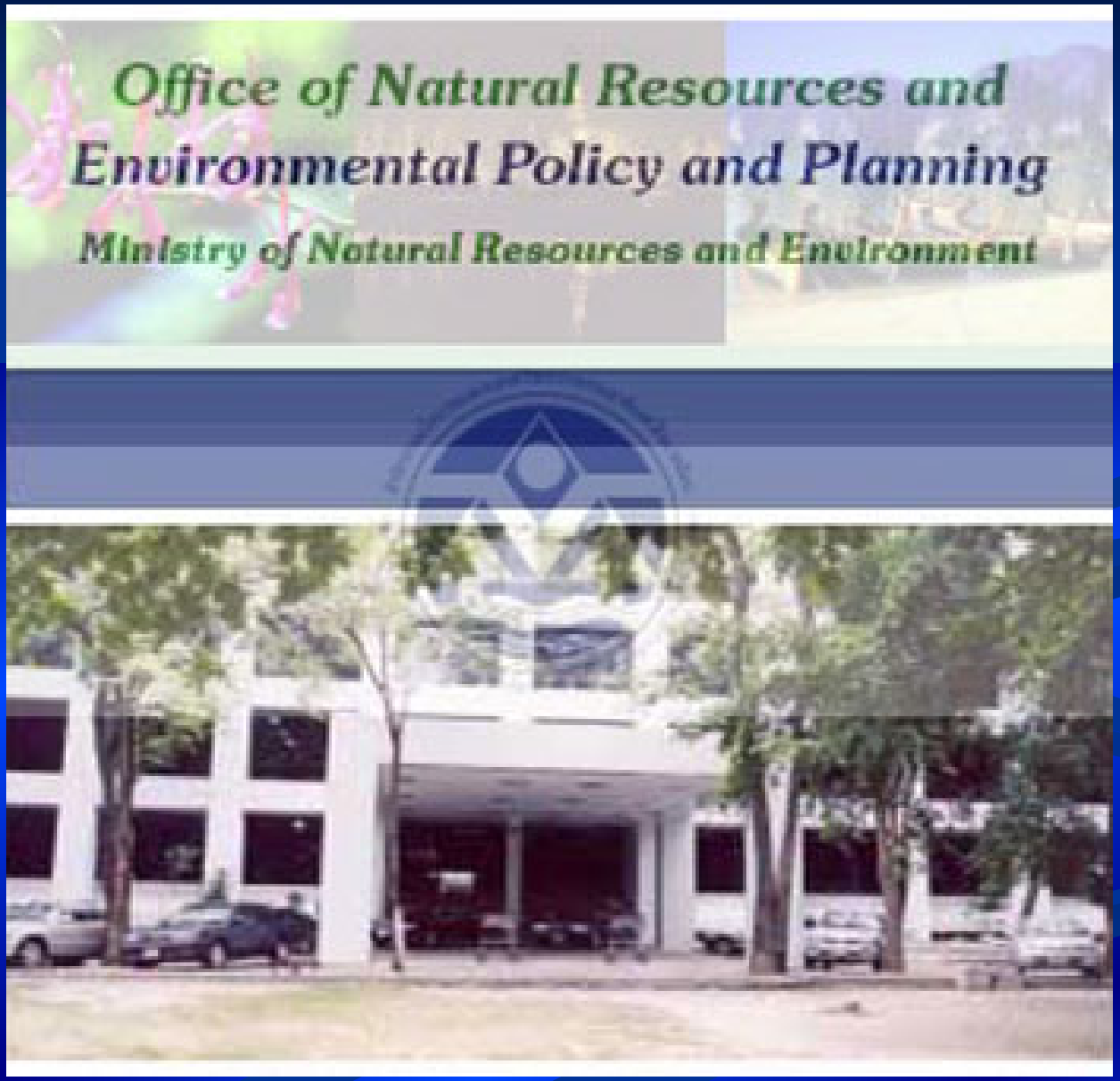
Group	Species in Thailand Number of sp.	Endemic species Number of sp.	%	Threatened species Number of species	%
Mammals	302	5	1.66	116	38.41
Birds	982	2	0.20	180	18.33
Reptiles	350 (366 forms)	47 (49 forms)	13.39	32 (33 forms)	9.02
Amphibians	137 (138 forms)	7	0.05	5	3.62
Fishes	2,820	72	2.55	12	7.62
Total	**4,591 (4,608** forms)	**133 (135** forms)	**2.93**	**548 (549** forms)	**11.91**

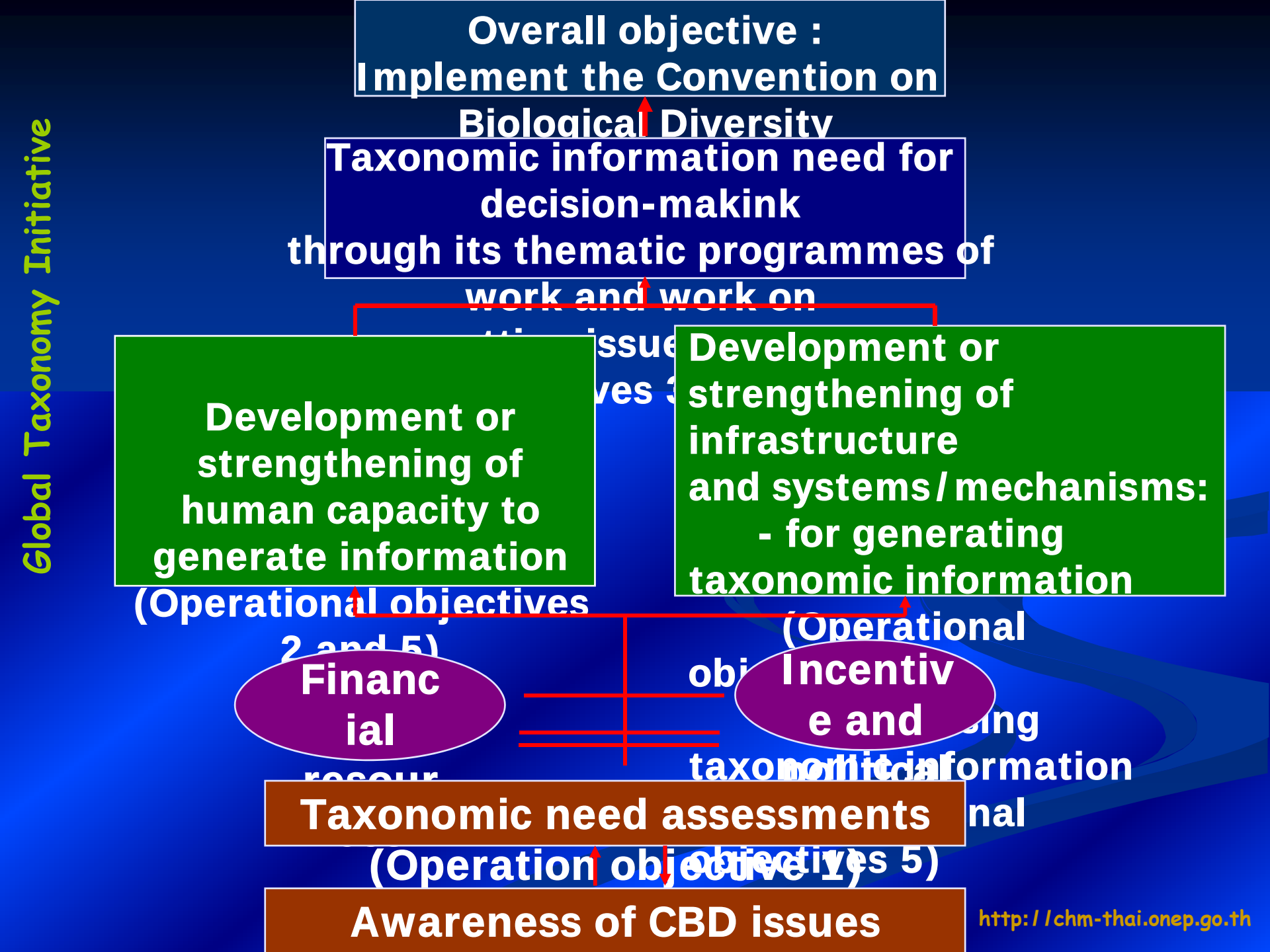
Threatened Plant Species in Thailand

Plant groups	Threatened sp.	Endemic sp.	Total no. found in Thailand
Pteridophyte	41	19	468
Gymnospermae	27	0	32
Angiospermae	**1,356**	738	**8,560**
Monocotyledonae	416	211	2,756
Orchidaceae*	175	87	1,200
Palmae*	85	16	150
Zingiberaceae*	57	27	270
Dicotyledonce	940	527	5,804
Euphobiaceae*	79	47	425
Rubiaceae*	71	53	600
Gesneriaceae*	63	46	144

Note: *only major families are demonstrated

National Focal Point of Thailand




Global Taxonomy Initiative
Overall objective :
Implement the Convention on
Biological Diversity
Taxonomic information need for
decision-makink
through its thematic programmes of
work and work on
Development or
strengthening of
human capacity to
generate information
(Operational objectives
Development or
strengthening of
infrastructure
and systems / mechanisms:
- for generating
taxonomic information
(Operational
Financ
ial
Incentiv
e and
Taxonomic need assessments
(Operation objective 1)
Awareness of CBD issues
http://chm-thai.onep.go.th

Thank you
for your attention