

MARINE BIOSAFETY IN DOMESTIC SHIPPING IN COASTAL AND INSULAR EAST ASIA



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Theme: Natural and Manmade Hazard Prevention and Management - Workshop on the Development and Advances on Marine Biosafety in the Context of the Convention on Biodiversity (25 November 2009)

East Asian Seas (EAS) Congress - Partnerships at Work: Local Implementation and Good Practices.
November 2009].

[PICC, Manila: 23-27

OUTLINE

- Focus of Presentation
- Introduction
- Relevant International Frameworks
- Current situation in the region
- Malaysia's Perspective: The SOM
- Threats to Biosafety
- The Way Forward
- Conclusion

FOCUS OF PRESENTATION

- Coastal and insular East Asia is a rich and diverse aquatic biogeographical region covering tropical to temperate zones and across longitude and from freshwater to oceanic waters.
- Shipping is a major mode of transport across islands for international and domestic.
- Measures or goals on marine safety are often easier to reach for international shipping but it is not always the case for domestic/national shipping.
- Aims to highlight the importance of marine biosafety in safeguarding local marine biodiversity in the context of domestic shipping, review what actions/programmes are in place or being taken and address future prospects.

INTRODUCTION

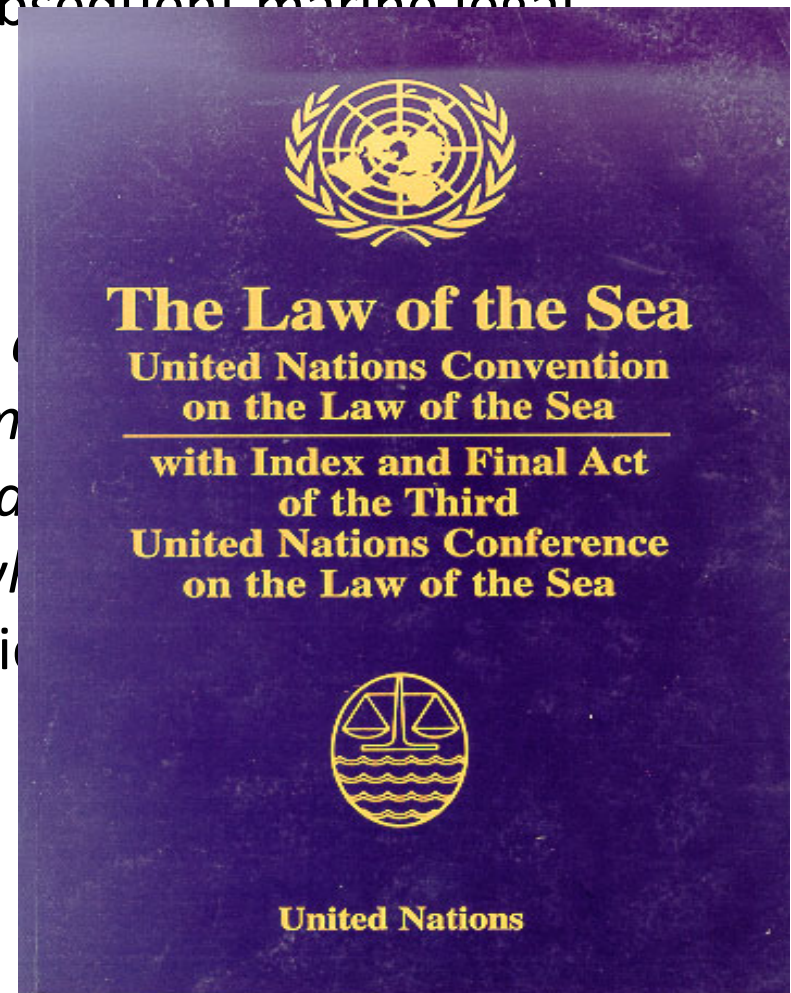
- Effective marine biosecurity is the science-based protection of native marine biodiversity and marine ecosystems that provide environmental, economic, social, and cultural values to society through effective management and control of non-native species (Biosecurity Council, 2003).

RELEVANT INTERNATIONAL FRAMEWORKS: OBLIGATIONS OF MEMBER STATES

- A number of international instruments (conventions and treaties) and non-binding agreements exist that address bioinvasions.
- Include conventions and treaties with general obligations for signatory Parties, those vested within the broader context of international quarantine agreements, that associated with protection of biological diversity (CBD 1992), and conventions that support the internationally consistent management of specific transport vectors (IMO).

UNCLOS 1982

- The rights and responsibilities agreed in the UNCLOS 1982 have created the legal basis for subsequent marine legal regimes.
- UNCLOS explicitly places a general obligation to take measures *'to prevent, reduce and eliminate pollution of the marine environment resulting from accidental introduction of species and other harmful organisms into part of the marine environment, with a view to avoiding harmful changes thereto'* (Article 192)

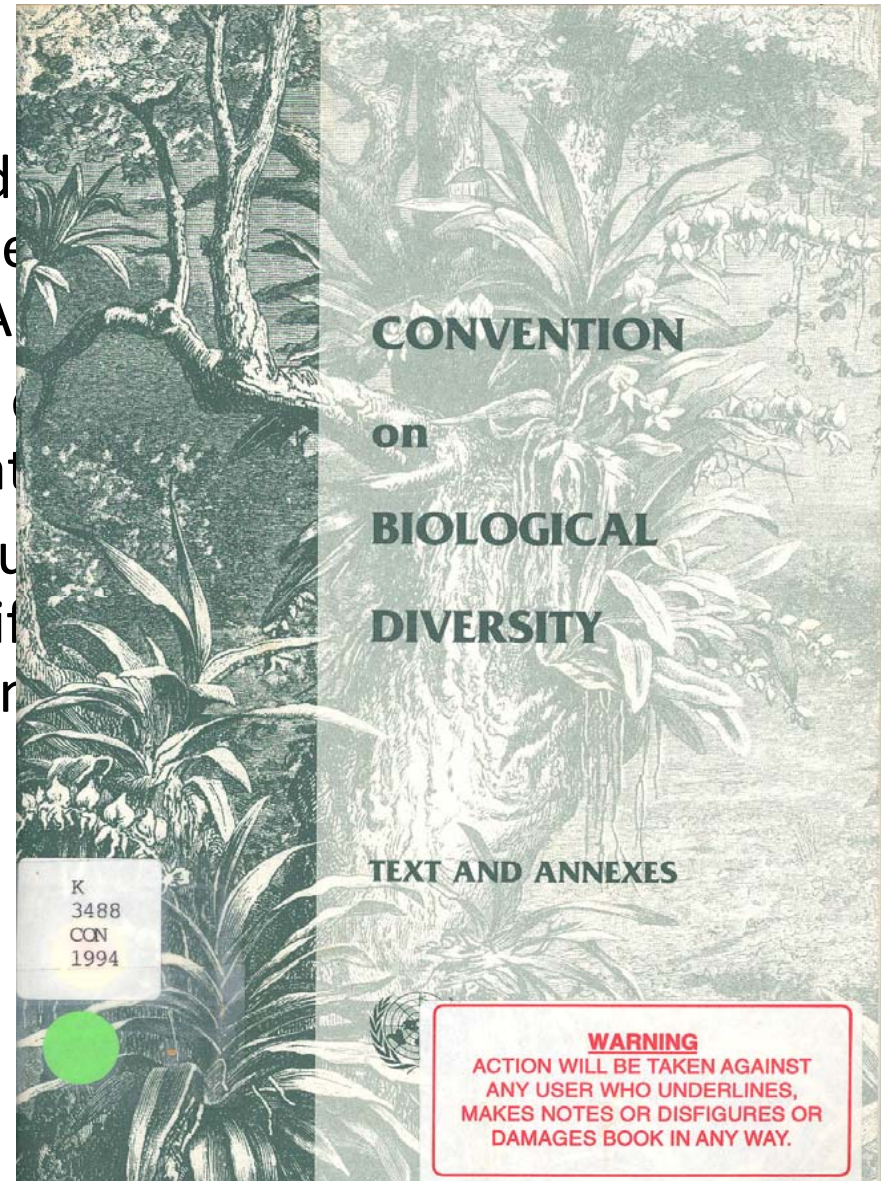


- Non-binding agreements, including voluntary codes that incorporate requests to limit or minimise the spread of alien species include the FAO Code of Conduct on Responsible Fisheries (Article 9 on Aquaculture providing a risk management framework for implementation to provide surety that intentional introductions follow
- Parties to RAMSAR Convention (Co are urged to ensure that measures control invasive alien species (Reso



The CBD 1992 is a comprehensive and legally binding convention for the protection of biodiversity. It places a number of obligations on Parties:

- Ensure activities within their jurisdiction do not cause significant damage to the environment of other States beyond the limits of national jurisdiction (Article 2)
- Prevent introduction of, control or eradicate invasive alien species which threaten ecosystems, habitats or species
- Ensure that environmental consequences of activities under their jurisdiction or control, which are likely to have significant adverse effects on biological diversity are duly taken into account



Vector-based International Instruments

- Ballast water and fouling
- Subject to specific convention managed by the IMO:
 - *International Convention on the Control and Management of Ships' Ballast Water and Sediments* (BWM, 2004).
 - *International Convention on the Control of Harmful Anti-Fouling Systems on Ships* (AFS, 2001).



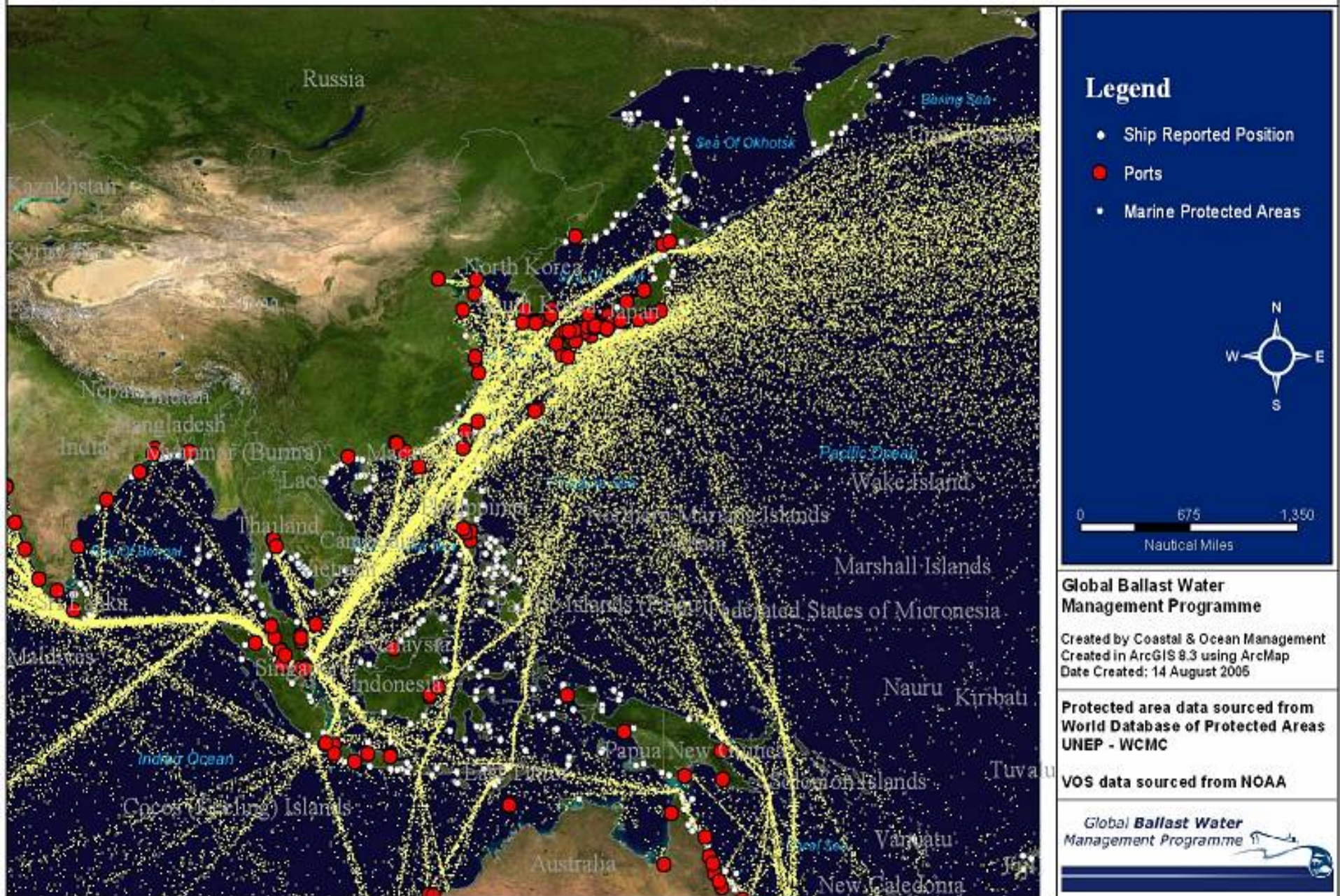
CURRENT SITUATION IN THE REGION

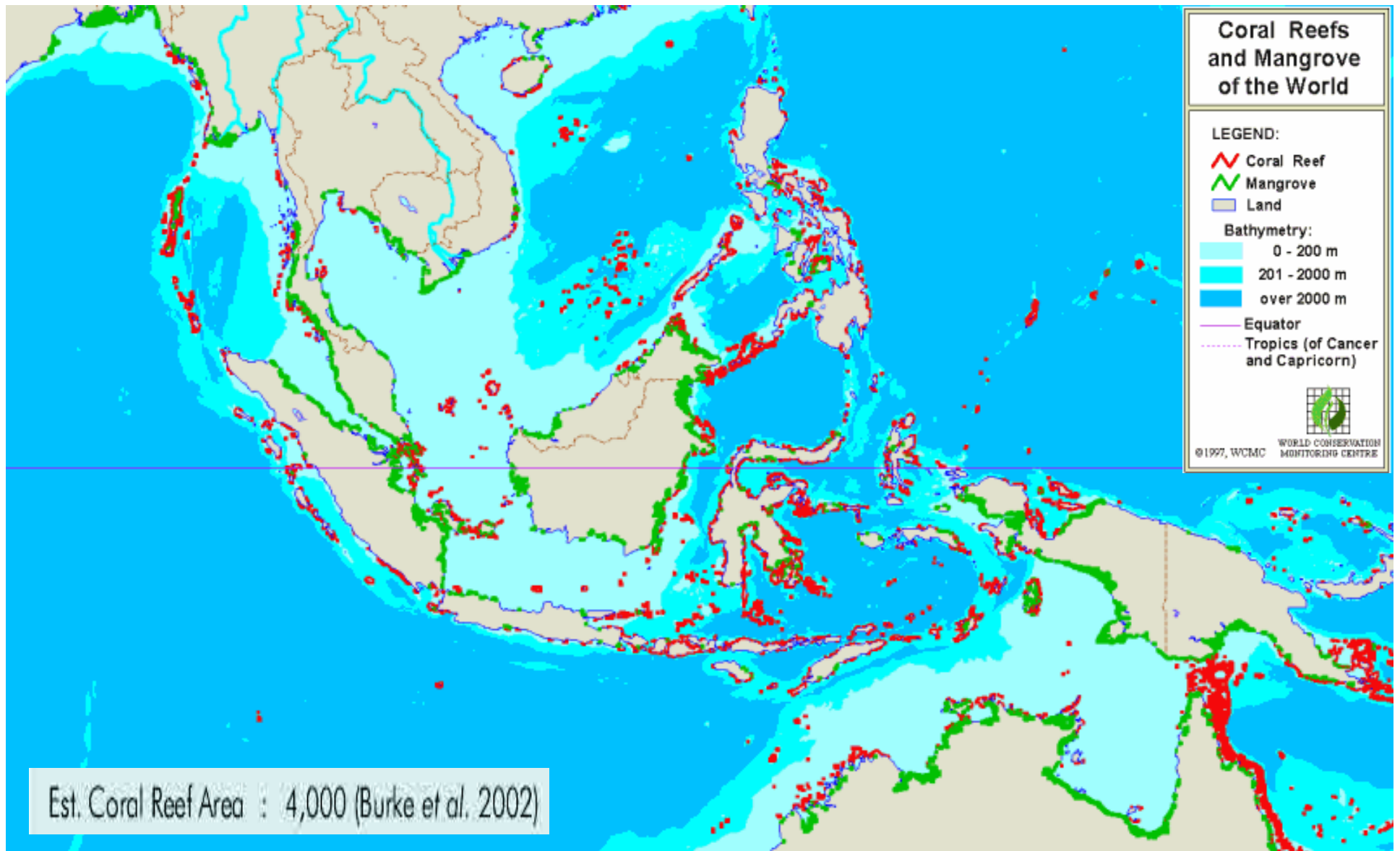
- Seas of East Asia are strategically located within one of the world's fastest growing trade and economic growth.
- Besides Lao (land-locked), other countries in the region are coastal states bordering bodies of water (seas, straits or gulfs).
- Nations in the region depend greatly on the sea to facilitate their trade and economic development.
- The maritime countries of East Asia hold one-third of the world's population, more than half of whom live in the coastal zone. Million people in the region depend for employment, income and daily sustenance.
- Medium for transportation and communication, facilitating trade and commerce, and economic growth.

SEAS IN THE REGION

- Andaman Sea and the South China Sea, one of the world's largest after the 5 oceans.
- South of Java of Indonesia, the Indian Ocean, the world's 5th largest ocean.
- The SOM, one of the busiest and most strategic sealanes in the world, connecting the west coast of P'sular Malaysia and the eastern part of the Indonesian island of Sumatra.

Ship Routes from Observed Ship Reporting Positions East Asian Seas





Source: UP-MSI, ABC, ARCBC, DENR, ASEAN, 2002. Marine Protected Areas in Southeast Asia. ASEAN Regional Centre for Biodiversity Conservation, Department of Environment and Natural Resources, Los Baños, Laguna, Philippines.

SHIPPING RELATED ACTIVITIES IN THE REGION

- 12 of the world's top 20 container ports (by throughput) are located in the region.
- 5 southeast asia ports are among the world's top container ports by volume handled – Singapore Port, Port Klang and PTP (Malaysia), Laem Chabang Port (Thailand), and Port of Tanjung Priok (Indonesia).

World's top container ports, by throughput (million TEUs)

Port	2007 ranking
Singapore	1
Hong Kong	2
Shanghai	3
Shenzen	4
Busan	5
Kaoshiung	6
Rotterdam	7
Dubai	8
Hamburg	9
Los Angeles	10
Qingdao	11
Long beach	12
Ningbo-Zhoushan	13

Antwerp	14
Guangzhou	15
Port Klang	16
Tianjin	17
New York / New Jersey	18
Tanjung Pelepas	19
Bremerhaven	20
Laem Chabang	21
Xiamen	22
Tanjung Priok	23

Source: UNCTAD, 2007

Throughput of ASEAN container ports vis-à-vis the world

Year	ASEAN ports throughput (million TEUs)	World ports throughput (million TEUs)	ASEAN ports share of world ports throughput (%)
1975	0.404	17.410	2.3
1985	1.802	37.163	4.8
1980	3.364	55.903	6.0
1990	9.466	85.597	11.1
1995	19.965	137.239	14.4
2000	50.546	225.294	22.4

Source: UNCTAD, 2007

MALAYSIA'S PERSPECTIVE: The SOM

- As of 1 January 2008, Malaysia had 392 vessels of 1,000 gross register tons (GRT) and above with a combined tonnage of 11.17 million deadweight tonnage (DWT); making it the 20th largest controlled merchant fleet in the world.
- SOM is one of the world's most strategic and important shipping lanes in the world, hosting half of the oil supply and a third of the world trade.
- Domestic shipping involves a large number of local operators and vessels, mostly single-vessel operator from the private sector. Besides MISC (with 27 LNG tankers), major shipping companies such as Gagasan Carriers, Global Carriers, Malaysia Bulk Carrier, and Wawasan Shipping have modern and well-diversified fleets.

The Straits of Malacca

Chokepoint	Usage (ships / day, 2003)
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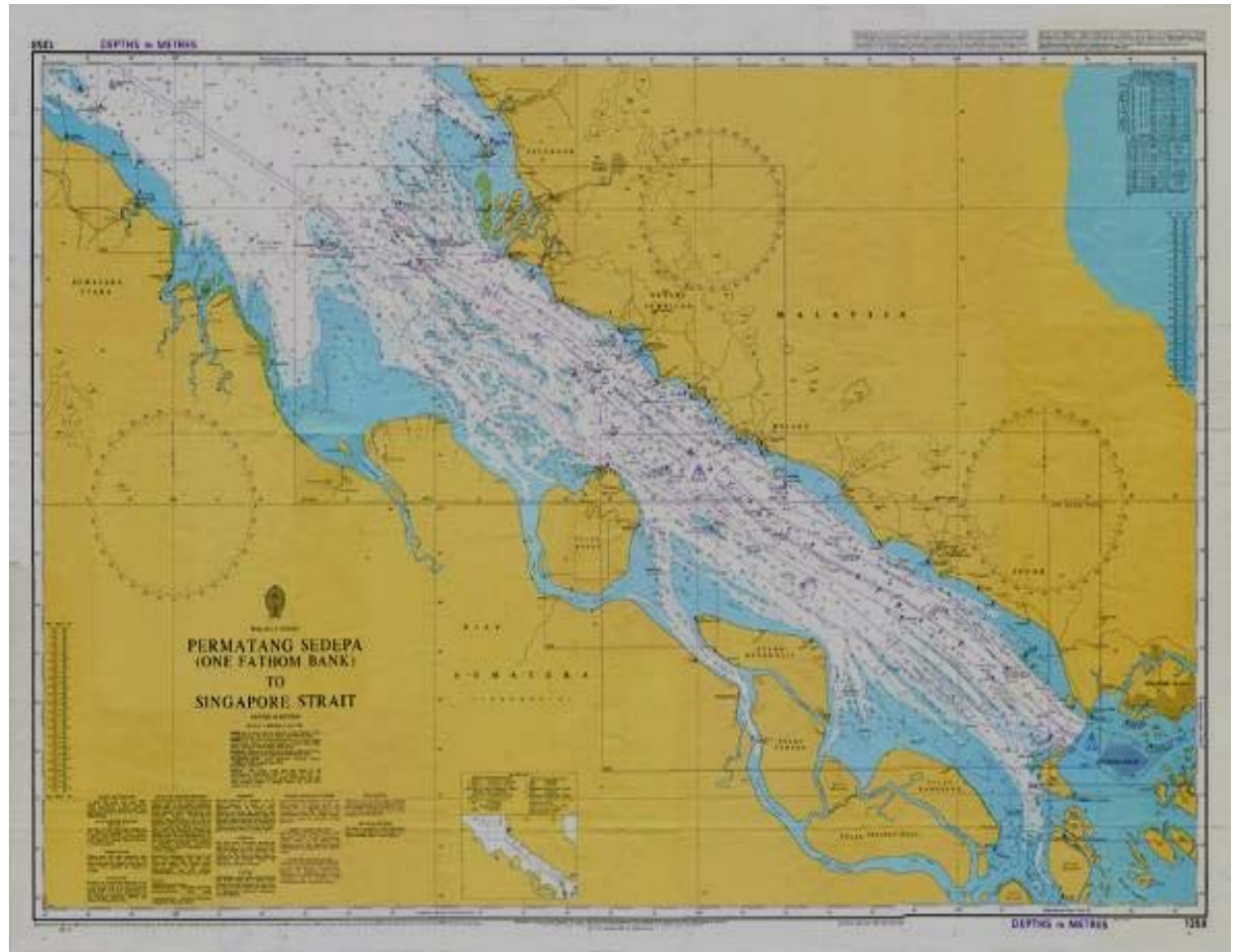
Hormuz	50
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Suez	38
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Bosphorus	135
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Malacca	600
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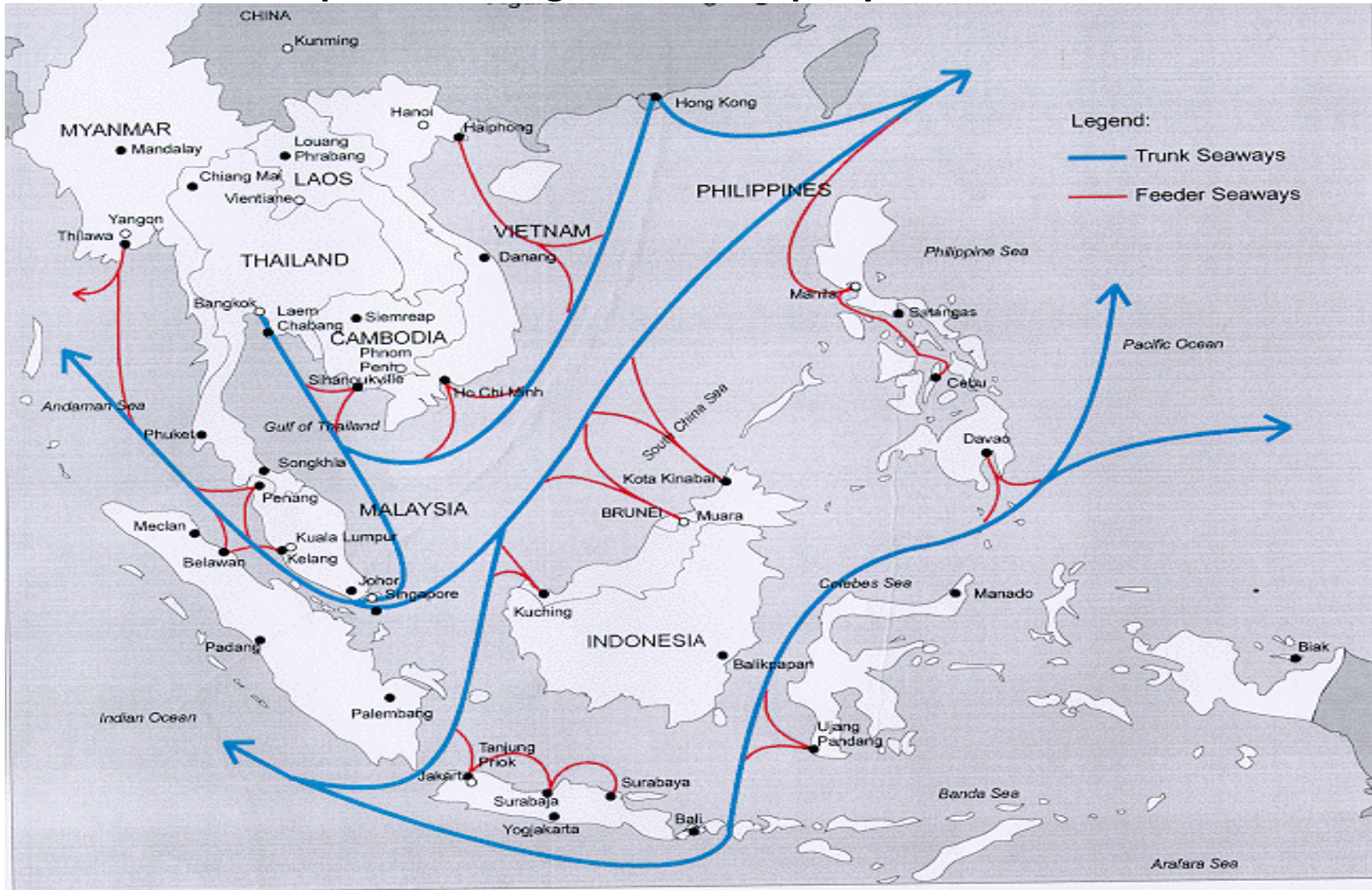
Panama	35
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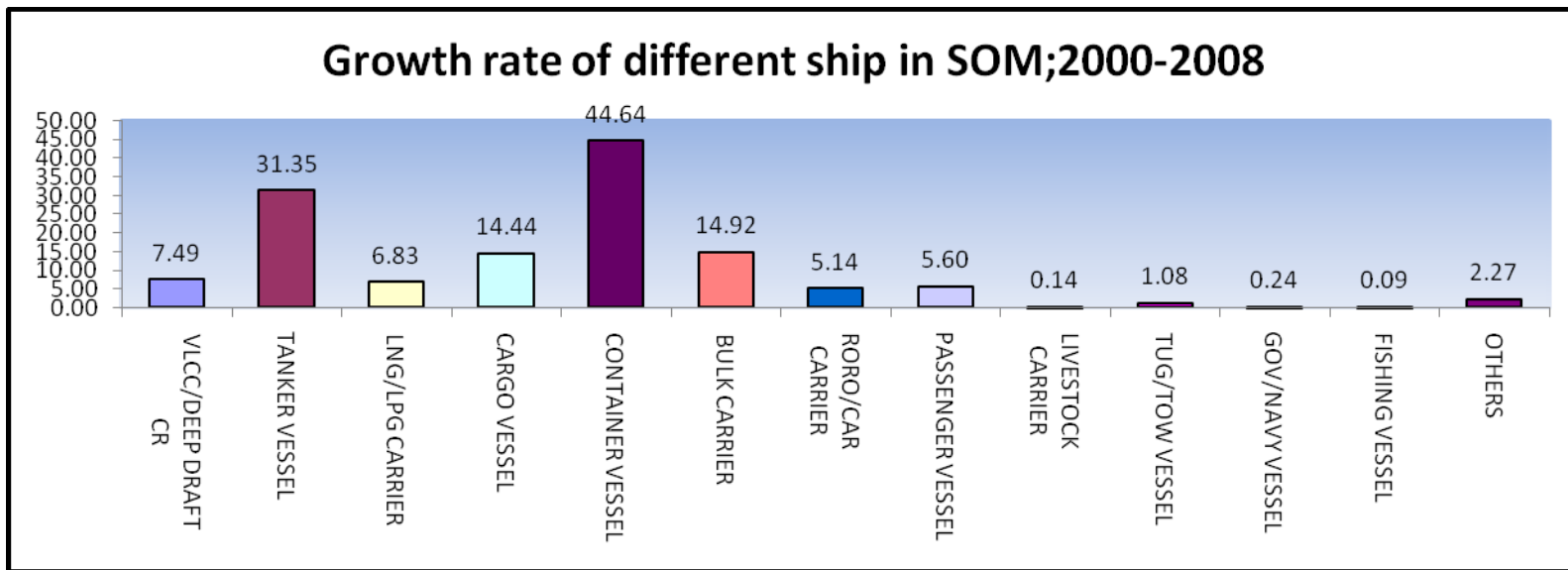
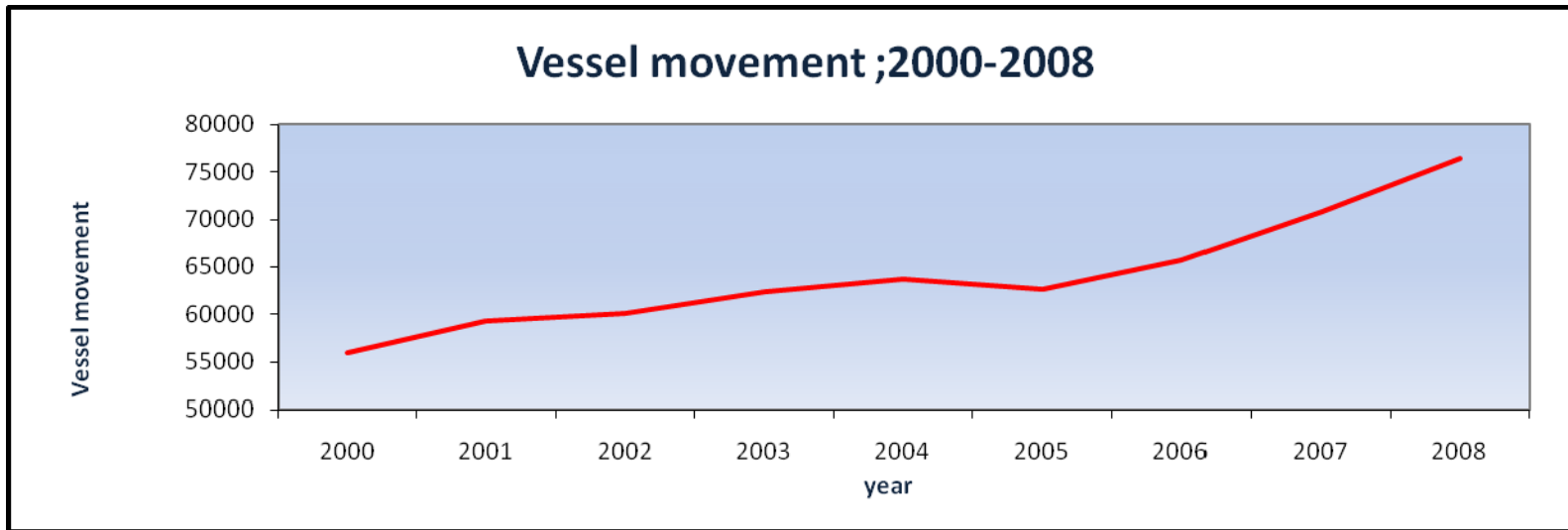
More than 600 ships pass through the Straits every day, making it one the busiest shipping channels in the world.

SEA LINES OF COMMUNICATIONS

- Straits of Malacca
- 80% of world's crude oil consumption passes through the Straits
- 80% of Malaysia's ports along the Straits
- 93,000 vessels passes through the Straits per year



Shipping Traffic in the Straits of Malacca



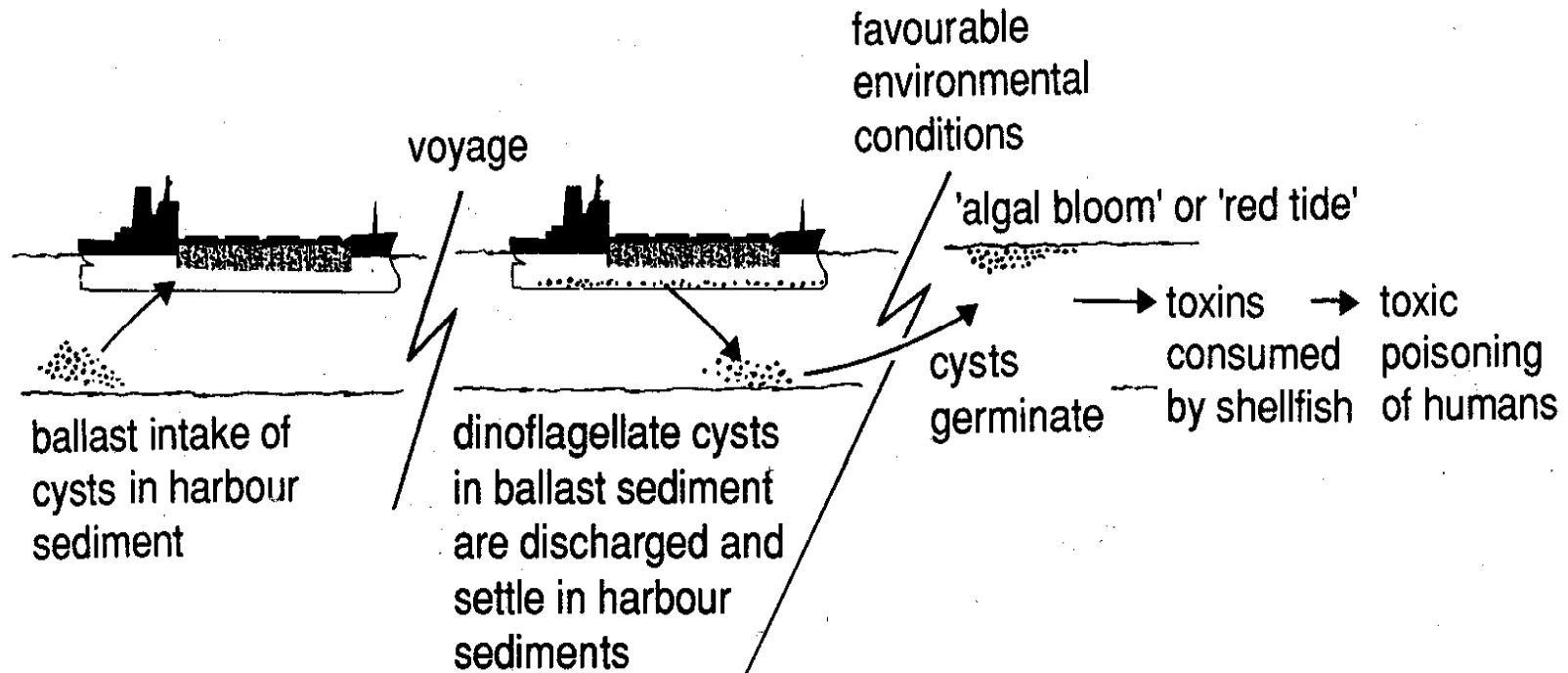
Source: Modified data from Malaysia Marine Department

Status of Ratification of IMO Conventions by Littoral States

Convention	Indonesia	Malaysia	Singapore
MARPOL 73/78	Annex I & II	Annex I,II & V	Annex I,II,III,IV & V
International Convention on the Control of Harmful Anti-fouling Systems on Ships 2001	N	N	N
International Convention for the Control and Management of Ships' Ballast Water & Sediment 2004	N	N	N

THREATS TO BIOSAFETY

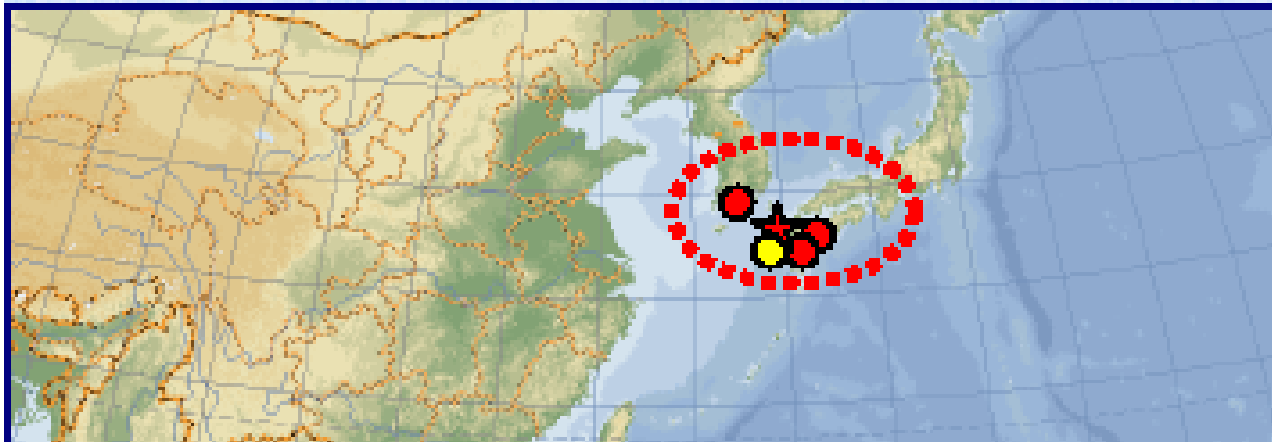
Possible Threat in Malaysia: Harmful Algal Blooms (HABs: - Ballast Water?)



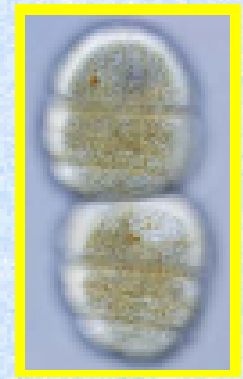
Invasive species – destruction of eco-system

Algae blooms – e.g. red tides -> fish kills

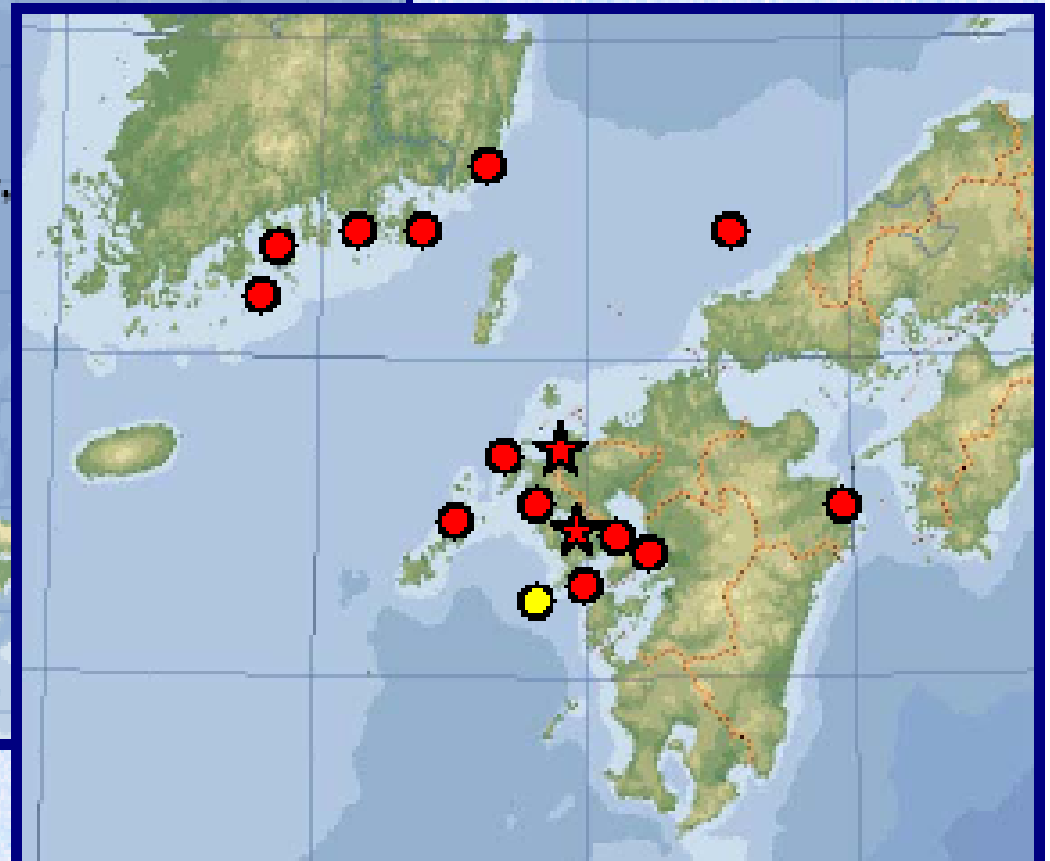
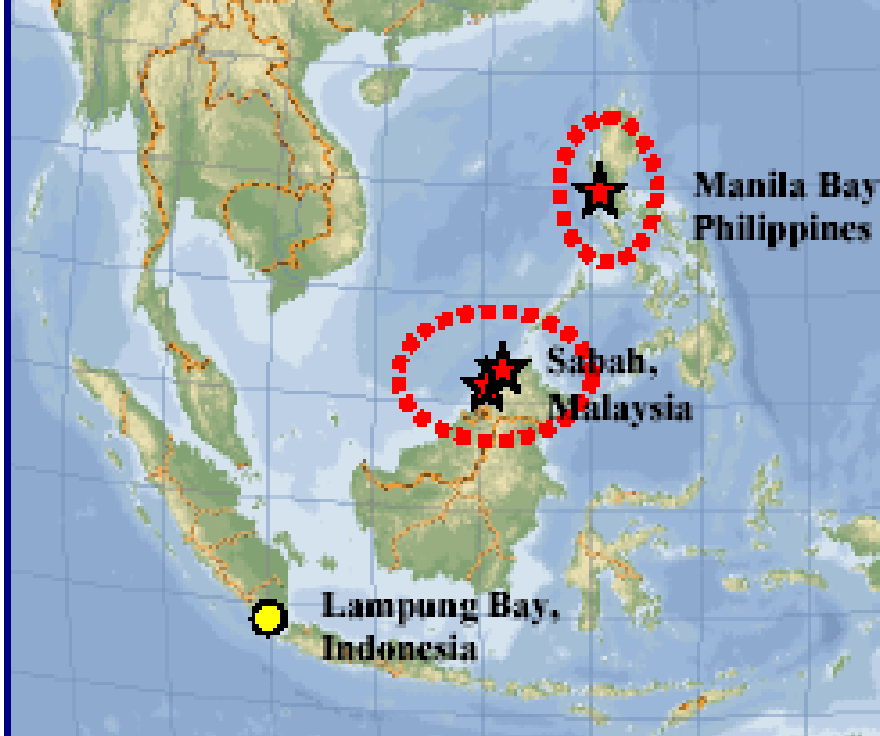
Distribution of *C. polykrikoides* population



C. polykrikoides



Cochlodinium sp.



C. polykrikoides

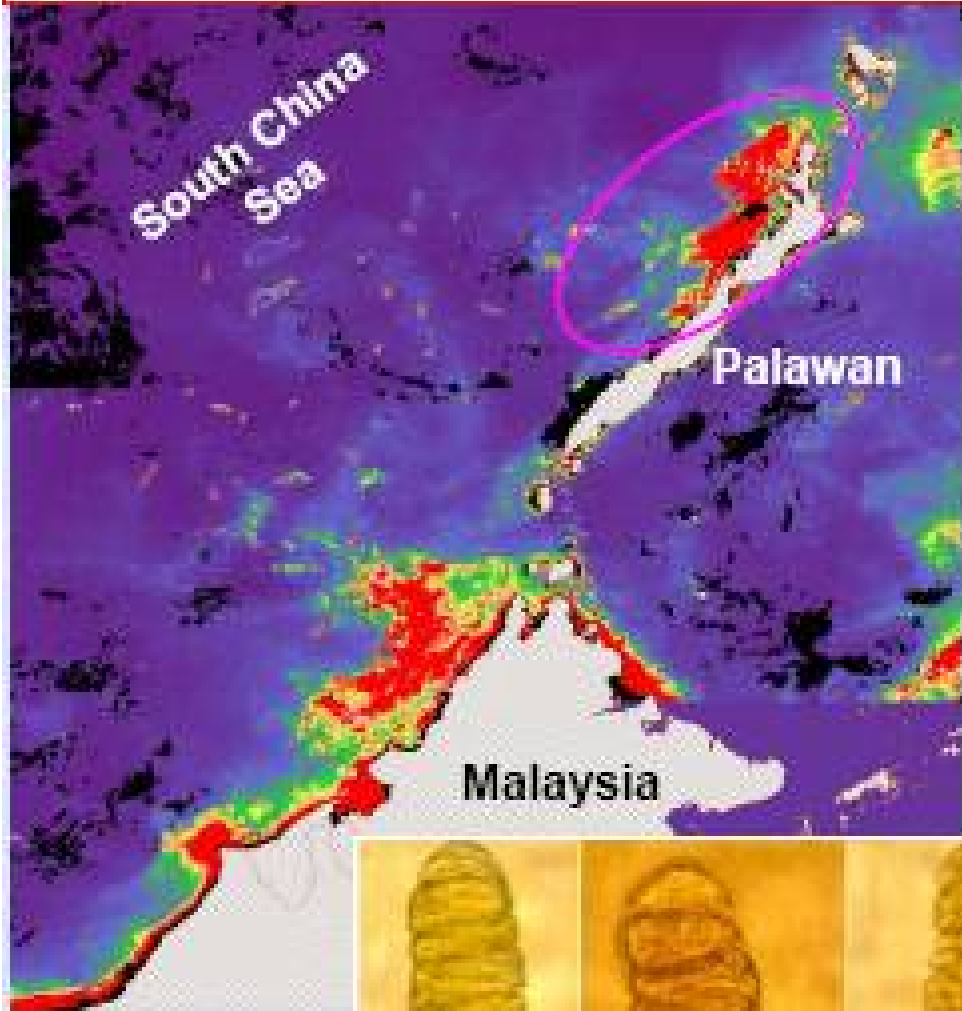


Japan, Korea



Other sequences

Red tide occurred in Malaysian, Brunei and Philippine waters

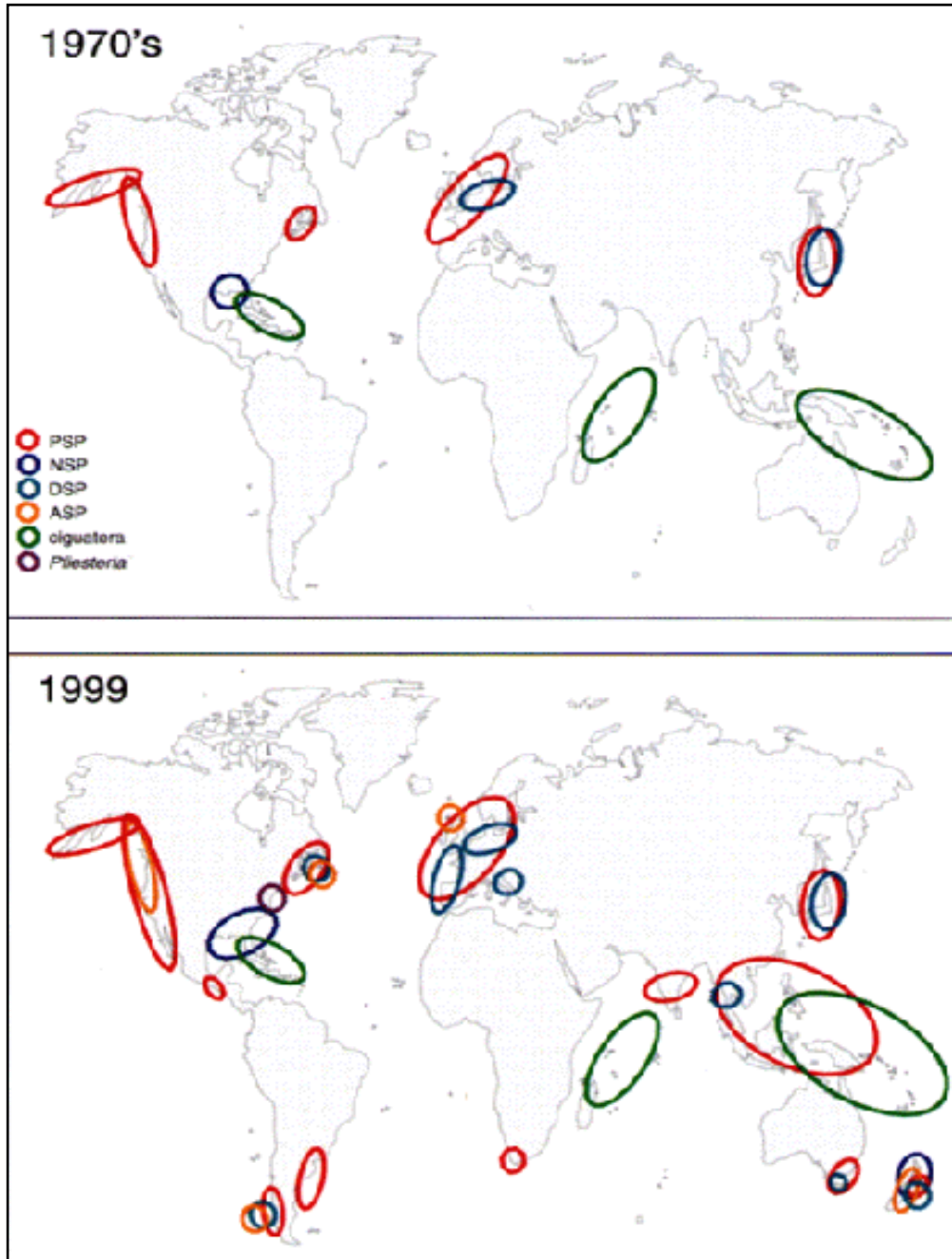


Cochlodinium sp.

HAB in Sabah



Global distribution of HAB



Contributing Factors:

- Ballast water transport
- Shellfish transplantation
- Environmental change (eutrophication/ contaminant loading)
- Global climate change

The global distribution of HAB events in 1999 compared to the 1970's (IOC, UNESCO, 2000)

Issues for Malaysia in terms of BWM

- Ballast water is not regarded as a pollutant in Malaysia.
- Although the national shipping companies are aware that ballast water in many ways is a cumulative and chronic problem, they are still reluctant to make decision to react to the issue.
- There is a lack of local marine biological diversity baseline data and records of possible introductions of species directly associated with ballast water to the environment; making it difficult to assess the extent of the problems associated with ballast water discharges in Malaysian waters.
In many groups of marine organisms, there is currently insufficient knowledge of the existing native organisms to enable assessment of possible alien species.

TBT in Coastal and Marine Waters in Malaysia

- Occurrence of TBT in the marine environment of Malaysia proven through studies on the effect of TBT in various groups of mollusks and the concentration of the biocidal agent in sediment samples - concentration of butyltin particularly significant in areas with high boating activities, ports and dockyards.
- Results obtained showed imposex occurrence in areas with high shipping traffic.
- A study (2001) to determine butyltin contamination in marine sediment of Peninsular Malaysia showed there was a high concentration in sampling sites of commercial shipping and boating sites such as Port Dickson, Port Klang, and Pasir Gudang Port (Wagiman *et al.*, 2003).

- This study also suggested that the level of total butyltin concentrations collected from the same sampling sites have increased manifold when the readings were compared with the study carried out in 1996 - the sediments taken from Port Dickson in 2001 recorded a reading of 700 ng g^{-1} compared to only 27.6 ng g^{-1} in 1996.
- This increase could be mainly due to the growth in the maritime sector that encompasses the expansion of ports and shipping industries, as well as the marine leisure industry in the area.

Issues for Malaysia in terms of AFS

- Indications of increased butyltin contamination in seawater and sediments of Malaysia are suggestive of the presence of organotin biocides from anti fouling systems.
- At present the marine water quality parameter in Malaysia does not take into account the pollutant level of TBT.
- Although the global prohibition of harmful anti fouling has come into effect, Malaysia has yet to promulgate its own legislative position on the control of toxic anti fouling biocides.

International Conventions Ratified by Malaysia for Biological Conservation

- Biological conservation:
 - UNCLOS 1982
 - Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) 1973
 - Convention on Biological Diversity (CBD) 1992
 - Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)

Biological Conservation

INTERNATIONAL

UNCLOS

RAMSAR

CITES

CBD

REGIONAL

ASEAN

Environmental Agreements

NATIONAL
(Malaysia)

Legislation

Fisheries Act

National Forestry Act

Wildlife Act

Policy

National Policy on Environment

National Policy on Biodiversity

National Forestry Policy

THE WAY FORWARD

- Shipping is an international industry and invasive species are a trans-boundary issue. All countries of the region have a vital stake in controlling the potential impact of existing and emerging threats to the sustainability of the seas in the region
- Regional and global cooperation, coordination & standardisation is critical
- Regional level:
 - States should ratify similar conventions
 - Increase capacity building among states
- National level:
 - Malaysia should ratify the BWM 2004 and AFS 2001 convention

- Capacity building and policy, legal and institutional reforms remain to be key hurdles in managing marine bioinvasions in this region regions.
- The need to remove these barriers by forging strategic alliances at global, regional and national levels.
- Work closely with IMO Member States and various other stakeholders from public and private sectors.
- The partnership effort need to involve global, regional and country-specific partners, as well as represent government, industry and non-governmental organisations.

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