

# Ocean Policy and Transboundary Resource Management

Tabitha Grace Mallory, Ph.D.  
China Ocean Institute and University of Washington

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# Outline

- Importance of This Issue
- Key Questions
- Elements of Good Transboundary Resource Management
- Regional SCS Mechanisms
- Fish Stock Assessment
- Policy Considerations

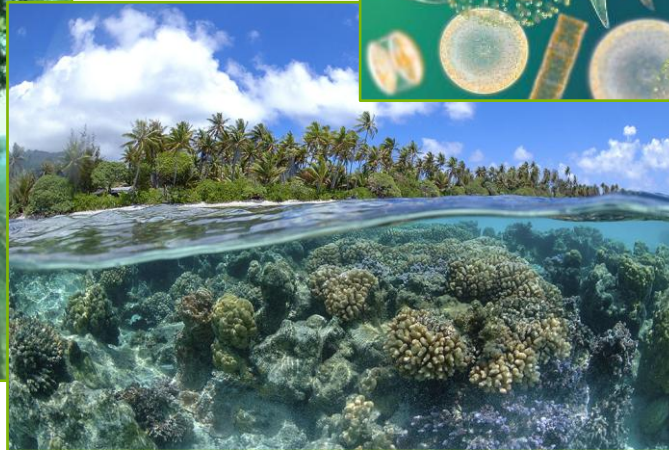
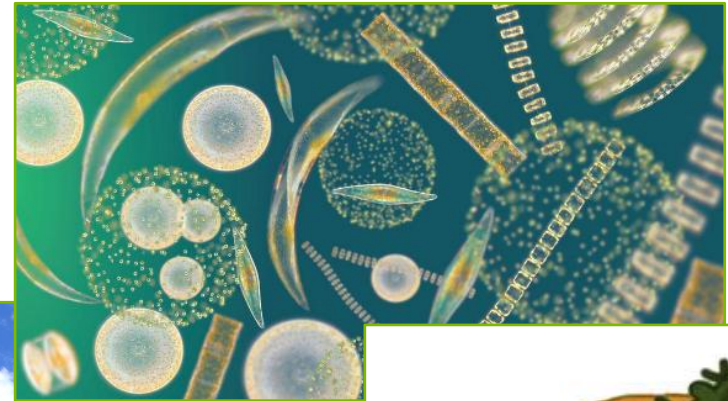


Why Should We Care?





# Marine Biodiversity





# South China Sea (SCS)

## Biodiversity Overview

- ◆ 8600 different species of plants and animals described by researchers in 2000
- ◆ 3365 marine fish species (out of about 15,000 globally)
- ◆ Global total mangrove species: 51
  - ◆ Atlantic has 5 mangrove species
  - ◆ SCS has 45 mangrove species
- ◆ Global coral genera: 70
  - ◆ SCS has 50 genera
  - ◆ Atlantic has 35 coral species; Persian Gulf: 57 species; Red Sea: 200; Southeast India: 117
  - ◆ SCS: 571 coral species



Sources: Ng and Tan; Talalue-McManus  
Photo: Greg Asner



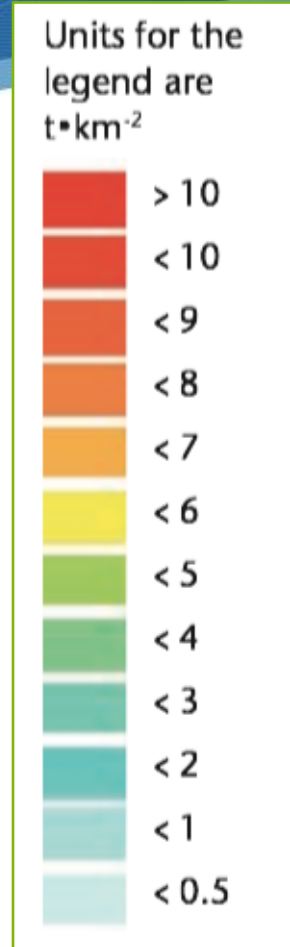
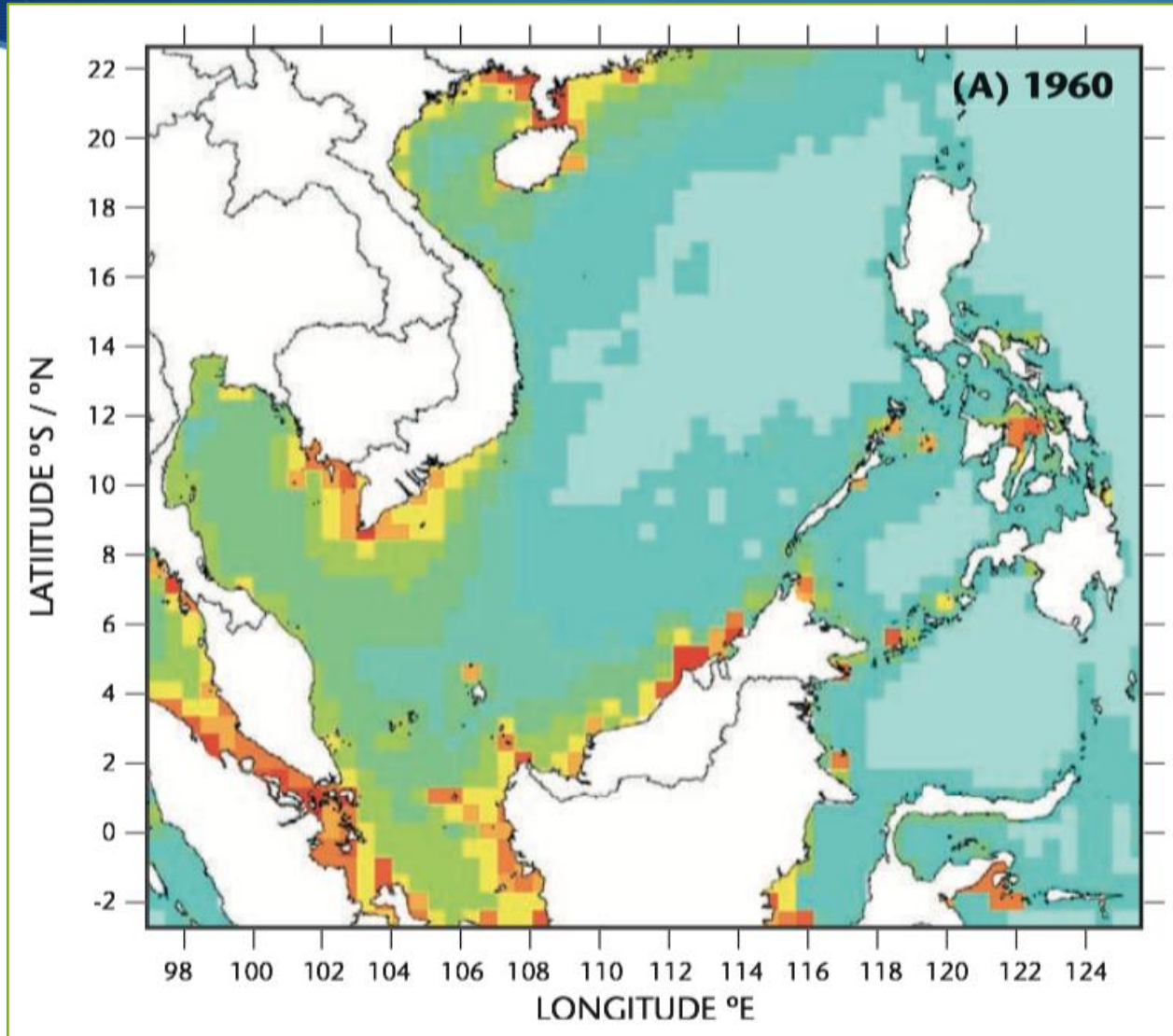
80% of SCS marine  
biodiversity is in poor  
condition



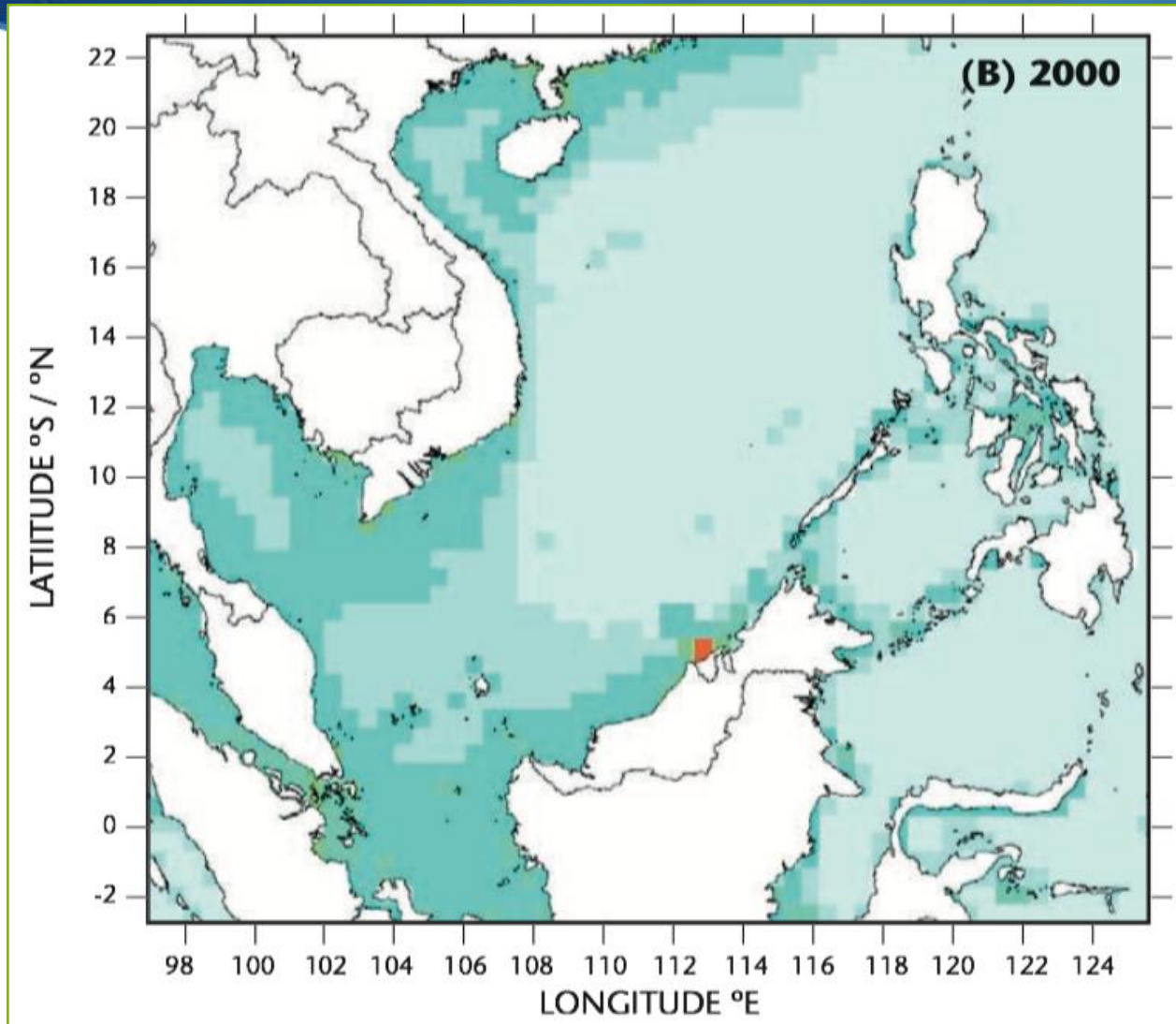
Source: UNEP, 2012



# SCS Biomass Density in 1960



# SCS Biomass Density in 2000



Units for the legend are  $t \cdot km^{-2}$





# Key Guiding Questions

- ◆ How to manage transboundary resources in disputed areas?
- ◆ What are best practices?
- ◆ How far along are we in having these?
- ◆ What are the trade-offs to consider?
- ◆ What is at risk if we don't develop a management system?
- ◆ What should ocean policy be on this issue?

# Transboundary Resources

- ◆ Fish
- ◆ Other marine biota
  - ◆ Marine mammals
  - ◆ Seabirds
  - ◆ Sea turtles
- ◆ Some resources like coral, mangroves, sea grasses that are in disputed areas





Most Challenging Issue?

# Elements of Good Transboundary Resource Management





# Governance and Institutions

- ◆ Environmental governance: guiding the behavior of human actors away from socially undesirable outcomes toward the achievement of socially desirable ends
- ◆ Do we need to have a government to have governance?
  - ◆ No! Sometimes governments can detract from good governance—can be too bureaucratic, deadlocked, corrupt
  - ◆ Governance can arise without public authority
  - ◆ Also created through negotiation and imposition
- ◆ Governing institutions (regimes): arrangements or systems to perform functions of governance, such as assigning roles and guiding interactions
  - ◆ Informal: social norms
  - ◆ Formal: laws, rules, regulations

# Environmental Problems

- Two main types of needs for environmental governance
  - To manage natural resources (like fish)
  - To manage “externalities” or negative side-effects of behavior (like pollution)





# SCS Fish Problem



- SCS catch estimated at 10 million tons officially
- But with illegal, unreported, unregulated (IUU) catch, possibly 16 million tons
- Global total: 81.5 million tons (marine capture)
- Total fishing vessels 1.77 million
- Total resource availability: 5–30% of 1950s levels

Sources: UBC, FAO

# SCS Governance and Institutions

- How should we govern the SCS so that we can avoid further depletion of fish stocks and move toward more sustainable management?
- What institutions should we create for this purpose?



# Types of Institutions/Regimes

- ◆ Constitutive: provides a broad guiding framework across a wide variety of issues
  - ◆ UN Convention on the Law of the Sea (UNCLOS) (1982/1994)
    - ◆ Established 200 nm exclusive economic zone (EEZ)
- ◆ Operational: provides more detailed set of guidelines for a specific issue
  - ◆ *The Agreement for the Implementation of the Provisions on UNCLOS Relating to the Conservation and Management of Straddling Stocks and Highly Migratory Fish Stocks*
    - ◆ “Fish Stocks Agreement” (1995/2001)
    - ◆ Regional Fisheries Management Organizations (RFMOs)
  - ◆ *The Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas*
    - ◆ “Compliance Agreement” (1995/2003)
    - ◆ Flag states required to monitor their fishing vessels



# Other Key Fisheries Instruments

## ◆ Non-binding

- ◆ *FAO Code of Conduct for Responsible Fisheries* (1995)
- ◆ *FAO International Plans of Action (IPOAs)*
  - ◆ *Reducing Incidental Catch of Seabirds in Longline Fisheries* (1998)
  - ◆ *Conservation and Management of Sharks* (1998)
  - ◆ *Management of Fishing Capacity* (1998)
  - ◆ *Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing* (2001)

## ◆ Binding

- ◆ *Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing* (2009/2016)

## ◆ Plus others!

# Assessing Institutional Effectiveness

- ◆ Outputs: measures to address the problem (e.g., laws and regulations)
- ◆ Outcomes: effect on behavior (e.g., decreased fishing)
- ◆ Impact: effect on the problem itself (e.g., more plentiful stocks)
- ◆ Illustrative example: Convention on Biological Diversity (CBD)
  - ◆ Output: Agreed on goal to create marine protected areas that cover at least 10 percent of coastal and marine lands by 2020
  - ◆ Outcome: 4 percent protected by law, 1 percent fully enforced (Our Ocean 2018)
  - ◆ Impact: “Biodiversity ... continues to decline in every region of the world, significantly reducing nature’s capacity to contribute to people’s well-being.” (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) 2018 Report) (okay, slightly unfair)

# Performance Standards

- ◆ Efficiency – is the institution cost effective?
- ◆ Equity – is the institution fair? Distributive consequences to winners and losers
- ◆ Participation – are the relevant stakeholders involved?
- ◆ Transparency – can outsiders assess performance?
- ◆ Accountability – are administrators accountable to public authority?
- ◆ **If these are not present, can undermine institution**

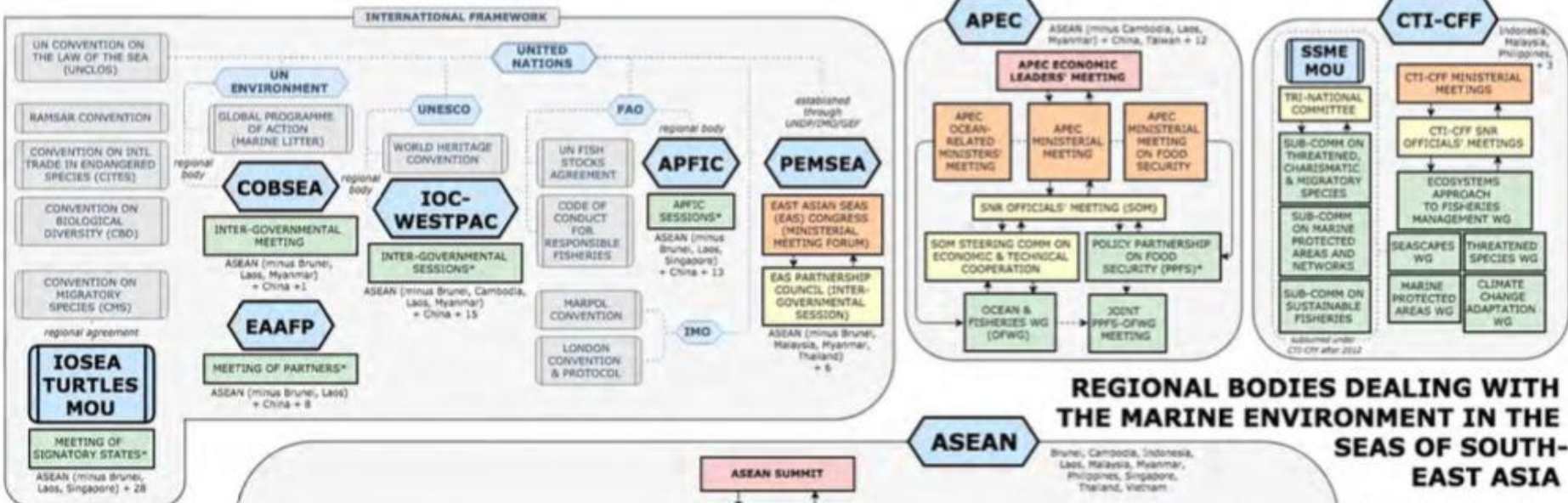


# Governance Challenges

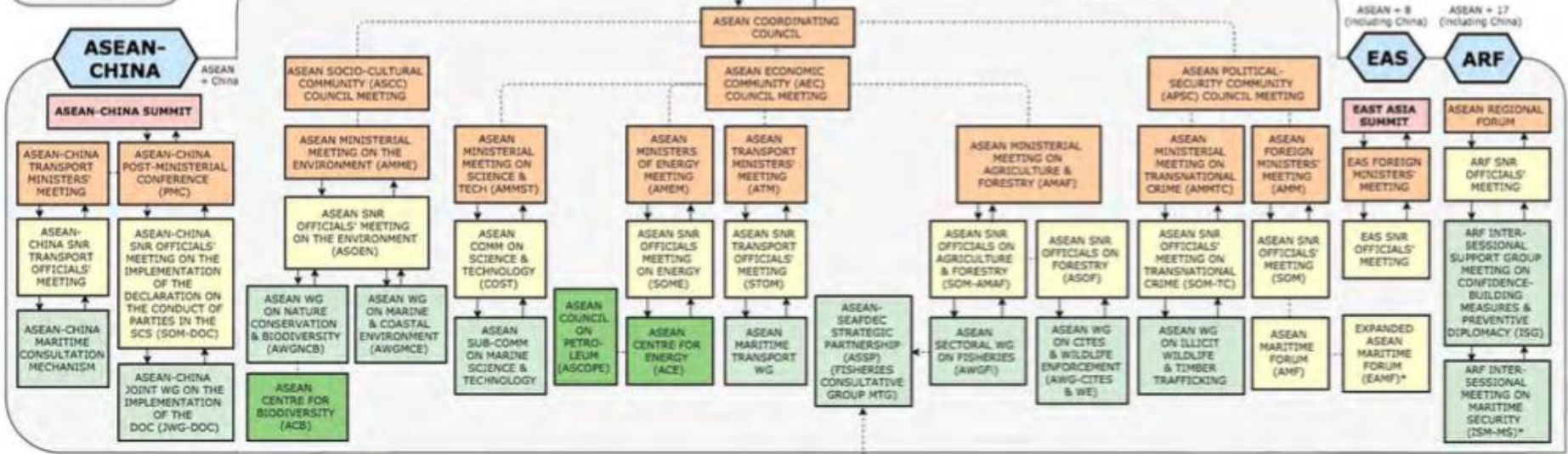
- ◆ Collective action problems: pursuit of individual interests leads to undesirable outcome for the group
  - ◆ “Tragedy of the commons” (Hardin)
    - ◆ Solve through social norms; privatization; regulation
    - ◆ But how to allocate privatized resources? Who is included?
  - ◆ Free-rider problem
    - ◆ Solve through dominant actor/hegemon; incentives; negotiation
    - ◆ But what if others disagree with hegemon? Who pays for incentives? How to ensure compliance with negotiated agreements?

# Governance Challenges

- ◆ Institutional interplay
  - ◆ Horizontal: governance systems at the same level dealing with different issues that overlap or affect each other
    - ◆ Example: capture fisheries; aquaculture; shipping; recreational use like swimming or sailing; seabed mining; marine pollution
    - ◆ Establish new regimes, or reform existing regimes? Fragmentation versus marginalization
  - ◆ Vertical: governance systems across different levels dealing with the same issue
    - ◆ Example: fisheries administration at international, national, local levels
      - ◆ Enforce catch quotas agreed internationally at local level
      - ◆ Data collection



## REGIONAL BODIES DEALING WITH THE MARINE ENVIRONMENT IN THE SEAS OF SOUTH-EAST ASIA



### REGIONAL BODIES/AGREEMENTS

- APEC:** Asia-Pacific Economic Cooperation
- APFIC:** Asia-Pacific Fisheries Commission
- ARF:** ASEAN Regional Forum
- ASEAN:** Association of Southeast Asian Nations
- CTI-CFF:** Coral Triangle Initiative on Coral Reefs, Fisheries & Food Security
- COBSEA:** Coordinating Body on the Seas of East Asia
- EAAFP:** East Asian-Australasian Flyway Partnership
- EAS:** East Asia Summit
- IOC Westpac:** Int'l Oceanic Commission Sub-Commission for the Western Pacific
- IOSEA MOU:** Indian Ocean-Southeast Asian Marine Turtle MOU
- PEMSEA:** Partnerships in Environmental Management for the Seas of East Asia
- SSME MOU:** Trilateral MOU for the Sulu-Sulawesi Marine Ecoregion

**SOUTHEAST ASIA FISHERIES DEVELOPMENT CENTRE (SEAFDEC)**  
ASEAN + Japan

### LEGEND

- Regional Organisation
- International Organisation
- Regional Agreement
- International Agreement
- Head of State/Government Level
- Ministerial Level
- Senior Officials Level
- Officials Level
- Technical Centre/Body
- Reporting Line
- Coordination Link
- Participates in
- Track 1.5



# Regional Marine Environmental Mechanisms

- ◆ Trend away from traditional, issue-by-issue, single-stock approach
- ◆ More holistic and integrated governance approach, ecosystem-based management
- ◆ Three different types of mechanisms:
  - ◆ Regional Seas programs
  - ◆ Regional Fishery Bodies (RFBs)
    - ◆ Regional Fisheries Management Organizations (RFMOs)
    - ◆ Advisory RFBs
  - ◆ Large Marine Ecosystem (LME) mechanisms

# Existing Efforts for SCS

- ◆ Asia-Pacific Fisheries Commission (APFIC)
- ◆ Southeast Asian Fisheries Development Center (SEAFDEC)
- ◆ ASEAN Sectoral Working Group on Fisheries
- ◆ ASEAN and SEAFDEC Strategic Partnership Regional Fisheries Management Mechanism (ARFMM)
- ◆ UNEP Regional Seas Program and SCS Strategic Action Program
- ◆ SCS LME Project
- ◆ SEAFDEC–COBSEA (Coordinating Body for the Seas of East Asia) Partnership on fishing *refugia*
- ◆ Partnerships in Environmental Management for the Seas of East Asia (PEMSEA)
- ◆ APEC working groups
- ◆ ASEAN–China partnerships
- ◆ China 21<sup>st</sup> Century Maritime Silk Road and other China-led initiatives



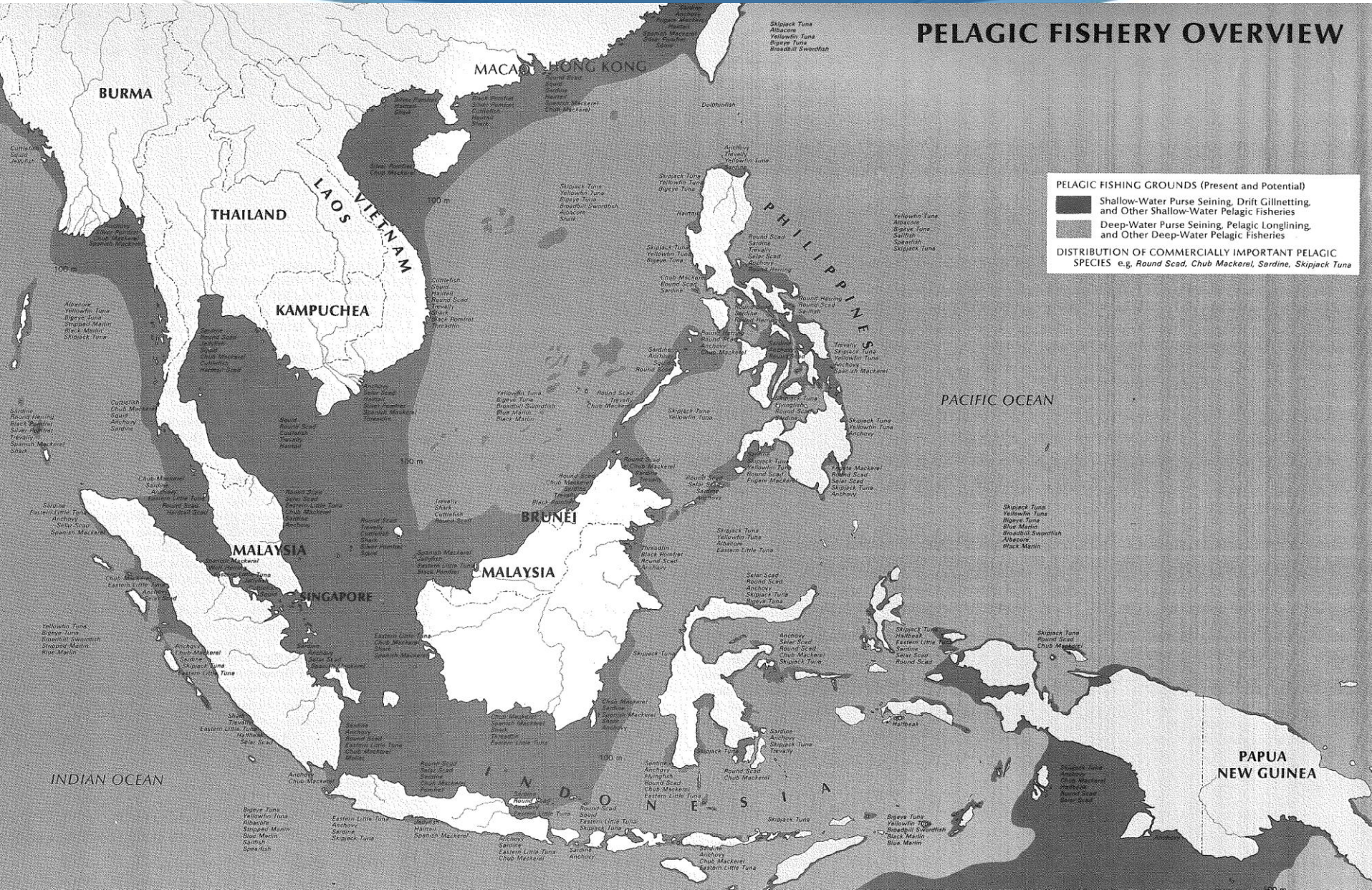


# What's Even There? Multilateral Fish Stock Assessment in the SCS



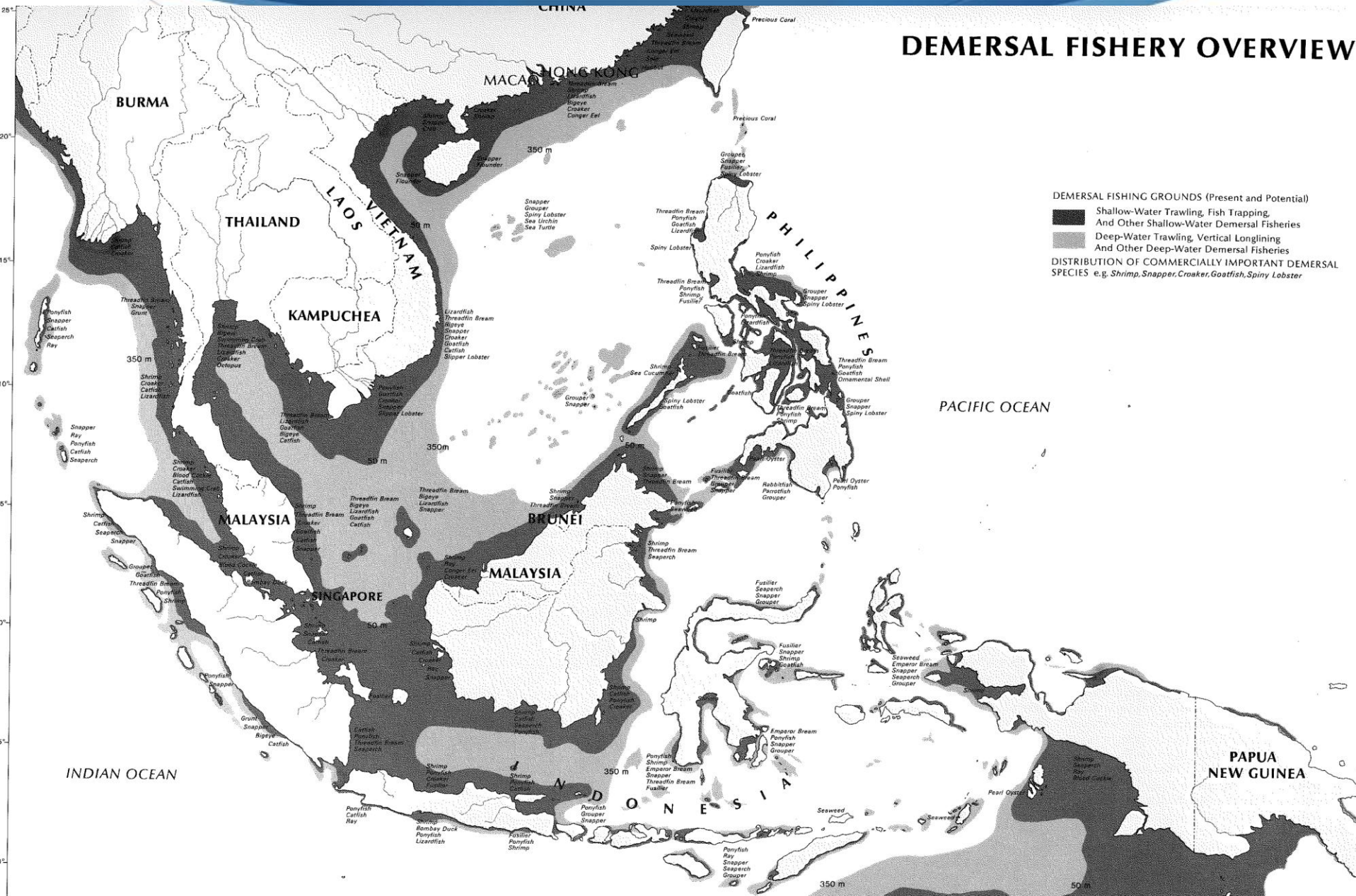


## PELAGIC FISHERY OVERVIEW





## DEMERSAL FISHERY OVERVIEW

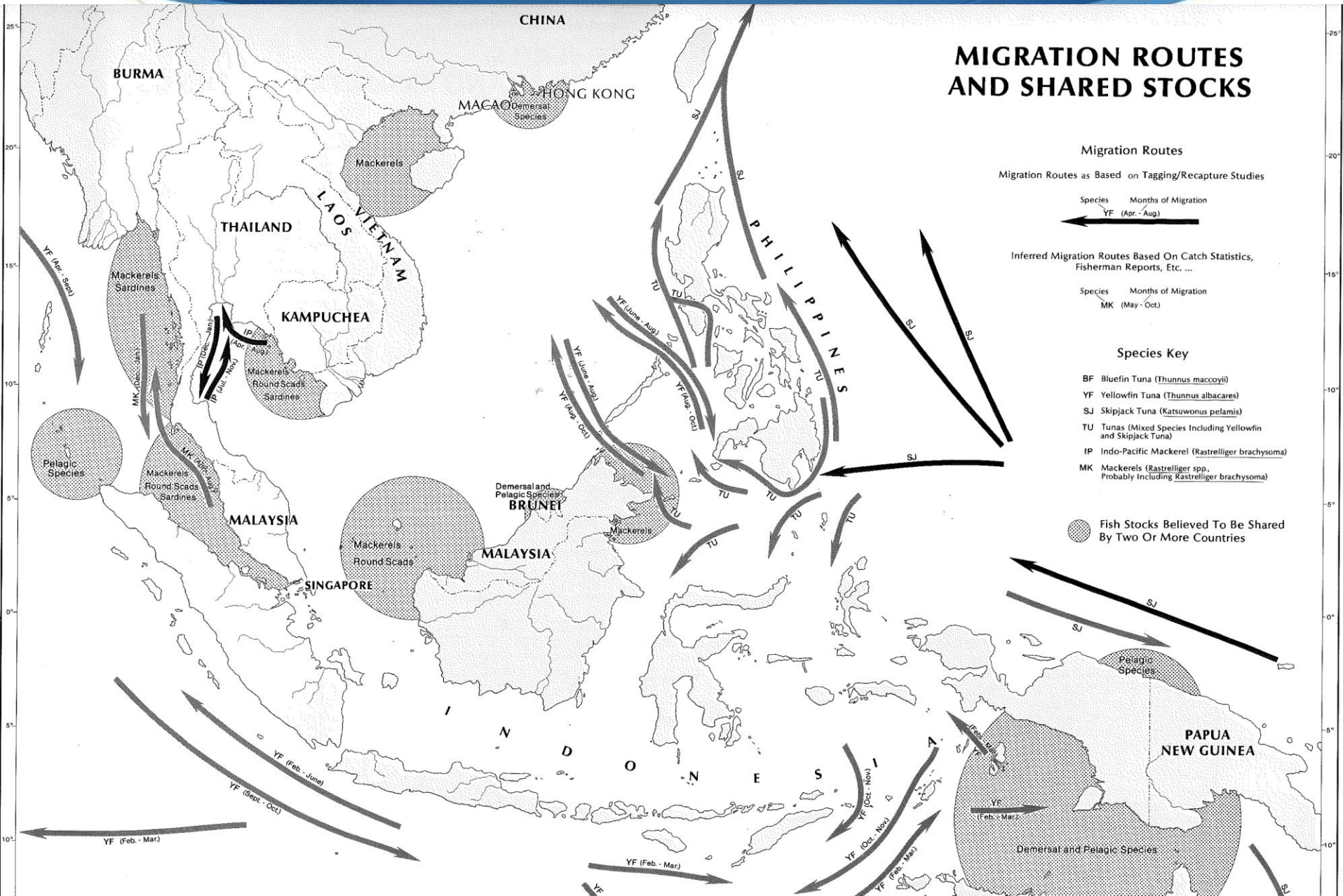


DEMERSAL FISHING GROUNDS (Present and Potential)

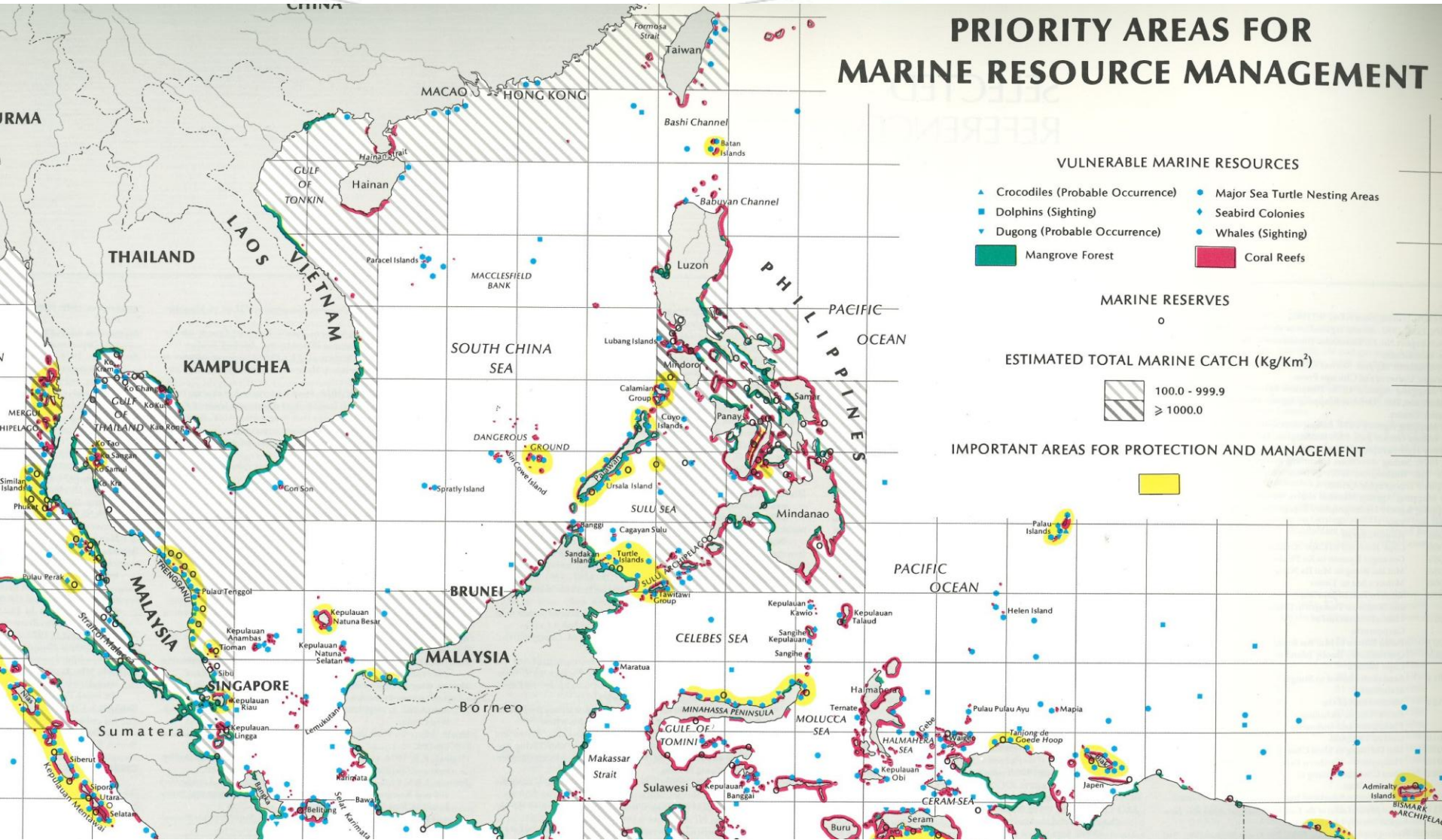
- Shallow-Water Trawling, Fish Trapping, And Other Shallow-Water Demersal Fisheries
- Deep-Water Trawling, Vertical Longlining And Other Deep-Water Demersal Fisheries

DISTRIBUTION OF COMMERCIALLY IMPORTANT DEMERSAL SPECIES e.g. Shrimp, Snapper, Croaker, Goatfish, Spiny Lobster









# Fish Stock Assessment

- ◆ Do not have good data on stocks even though heavy fishing activity
- ◆ Need to understand what is there before we can manage
- ◆ Fishery-dependent data: based on how much was caught
  - ◆ Methods: self-reporting, onboard observers, portside surveys, telephone surveys or vessel-monitoring systems
  - ◆ The most common sources of data are landings records and port samples. Landing records, which result directly from the sale of caught fish, provide information only on landed catch. The data is often in the form of total weight and rarely in total numbers of fish.
- ◆ Fishery-independent data: determining how much is out there based on surveys, done systematically, understand spawning grounds
  - ◆ Methods: trawl, acoustic, video and side-scan sonar research surveys and some tagging experiments
  - ◆ The vast majority of fishery-independent data comes from research surveys conducted by national governments



# Fish Stock Assessment

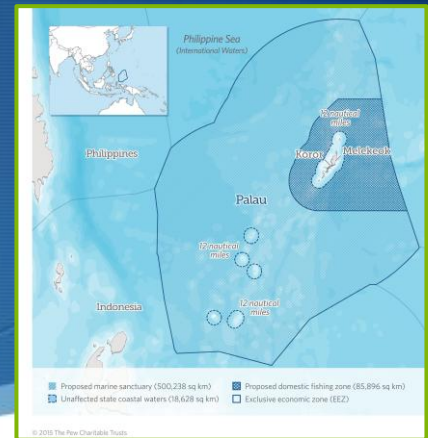
- ◆ No country can do this alone
- ◆ Need to get existing data from SCS countries; establish rules on sharing data
- ◆ Need understanding of life-cycles of species; how climate change will affect this
- ◆ Which scientific institutes will participate?
- ◆ Which stocks to assess?

# Policy Considerations



# Moving Forward

## Evaluating Proposed Solutions



- ◆ “Meta-sovereignty” or “post-sovereignty” ideas
  - ◆ Turn Spratlys into marine peace park (McManus)
  - ◆ Marine Protected Areas Network
  - ◆ *Refugia*
- ◆ Incorporate SCS into Western and Central Fisheries Commission (WCPFC) or create new RFMO
- ◆ CSIS Fishery and Environmental Management Area Proposal
- ◆ UN Biodiversity in Areas Beyond National Jurisdiction (BBNJ)?





# SCS Strategic Action Plan

- ◆ Seven participating countries: China, Vietnam, Philippines, Indonesia, Thailand, Malaysia, Cambodia
- ◆ Address important species during critical stages of their life-cycle
- ◆ What they've done that's useful:
  - ◆ Tons of data collection
  - ◆ Identified sites most in need of protection: 26 mangrove sites; 43 coral reef sites; 26 seagrass sites; and 40 wetlands sites
  - ◆ Regionally agreed high-priority ranked lists of 58 pelagic and 29 demersal fish species, 15 cephalopods, and 18 crustaceans in SCS and Gulf of Thailand
  - ◆ Identification of 52 known spawning and nursery areas

# SCS Pelagic Species

Common name	Species	Occurrence					Ranking of transboundary significance						
		Thailand	Viet Nam	Cambodia	Indonesia	Philippines	Cambodia	Indonesia	Philippines	Thailand	Viet Nam	Expert	Average
Narrow-barred Spanish mackerel	<i>Scomberomorus commerson</i>	X	X	X	X	X	5	5	5	5	3	4.5	4.58
Indian mackerel	<i>Rastrelliger kannagurta</i>	X	X	X	X	X	4	5	5	5	2	4.5	4.25
Frigate tuna	<i>Auxis thazard</i>	X	X	X	X	X	3	4	5	5	4	4.5	4.25
Indo-Pacific king mackerel	<i>Scomberomorus guttatus</i>	X	X	X	X	X	5	4	5	4	3	4	4.17
Short mackerel	<i>Rastrelliger brachysoma</i>	X	X	X	X	X	3	5	5	4	3	4.5	4.08
Sardinellas	<i>Sardinella spp</i>	X	X	X	X	X	4	3	4	5	3	4	3.83
Kawakawa	<i>Euthynnus affinis</i>	X	X	?	X	X		5	5	5	3	4.5	3.75
Japanese scad	<i>Decapterus maruadsi</i>	X	X	X		X	2	0	5	5	4	4.5	3.42
Longtail tuna	<i>Thunnus tonggol</i>	X	X	?	X	X		3	5	5	2	5	3.33
Anchovies	<i>Stolephorus, Encrasicholina</i>	X	X	X	X	X	4	3	4	3	3	3	3.33
Shortfin scad	<i>Decapterus macrosoma</i>	X	X	?	X	X		3	5	5	2	4	3.17
Bigeye scad	<i>Selar crumenophthalmus</i>	X	X	X	X	X	2	4	4	4	1	4	3.17
Bullet tuna	<i>Auxis rochei</i>	X	X	X		X	3	2	5	3	2	3	3.00
Yellowfin tuna	<i>Thunnus albacares</i>		X		X	X		0	5		5		1.67
Indian scad	<i>Decapterus russelli</i>	X		?	X	X		4	4	3		3.5	2.4

Source: SCS Strategic Action Plan



Coral Reef Site

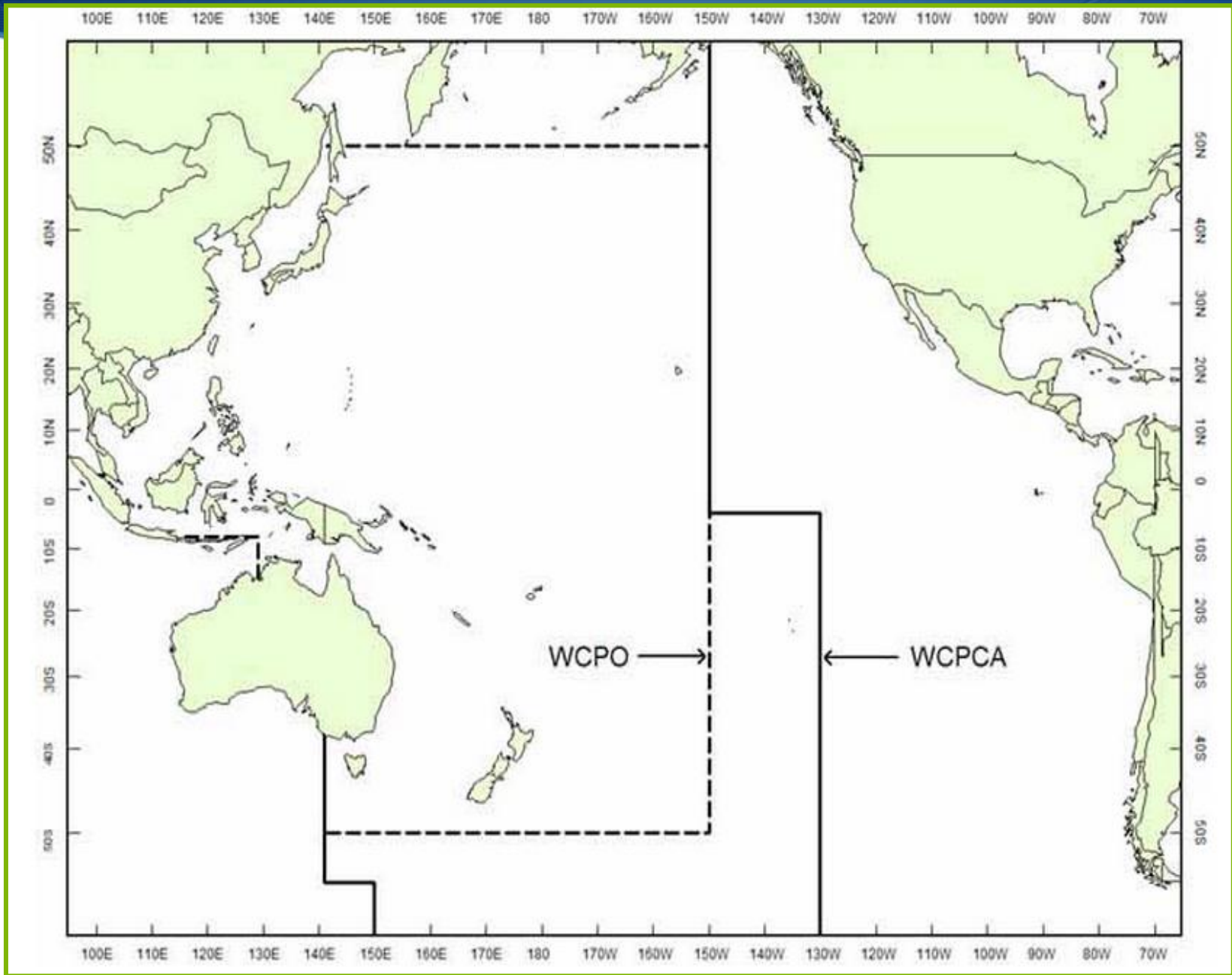
Seagrass Site

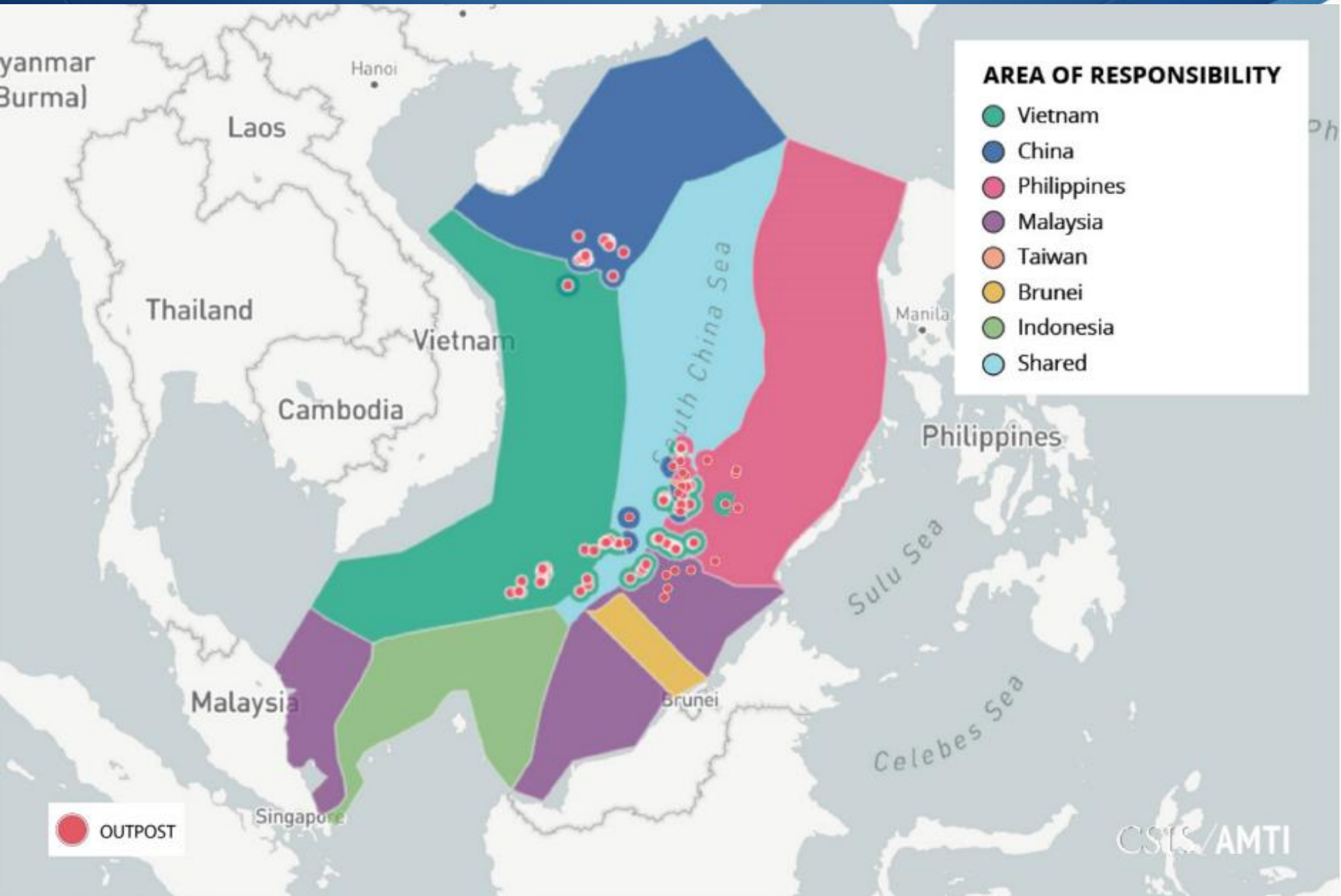
South China Sea Project

Image NASA  
Image © 2008 TerraMetrics

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## AREA OF RESPONSIBILITY

- Vietnam
- China
- Philippines
- Malaysia
- Taiwan
- Brunei
- Indonesia
- Shared





# Other Considerations

- ◆ Legally binding versus nonbinding arrangements? Nonbinding has been easier in the SCS
- ◆ Coast guard partnerships
- ◆ Climate change
  - ◆ Effects
  - ◆ To drill or not to drill?
- ◆ Network of scientists?
- ◆ How do socio-economic development issues affect this?
- ◆ Pollution
  - ◆ 80 percent of marine pollution comes from land
  - ◆ Agricultural runoff
  - ◆ Toxic waste
  - ◆ Human waste
  - ◆ Plastics
  - ◆ Shipping waste—fishing gear, illegal discharge, illegal dumping
- ◆ What about Taiwan?



Dead juvenile sea turtle after Deepwater Horizon spill

Photo Credit: Joel Sartore



Photo credit: Justin Hofman



Good luck!

[tabitha@uw.edu](mailto:tabitha@uw.edu)