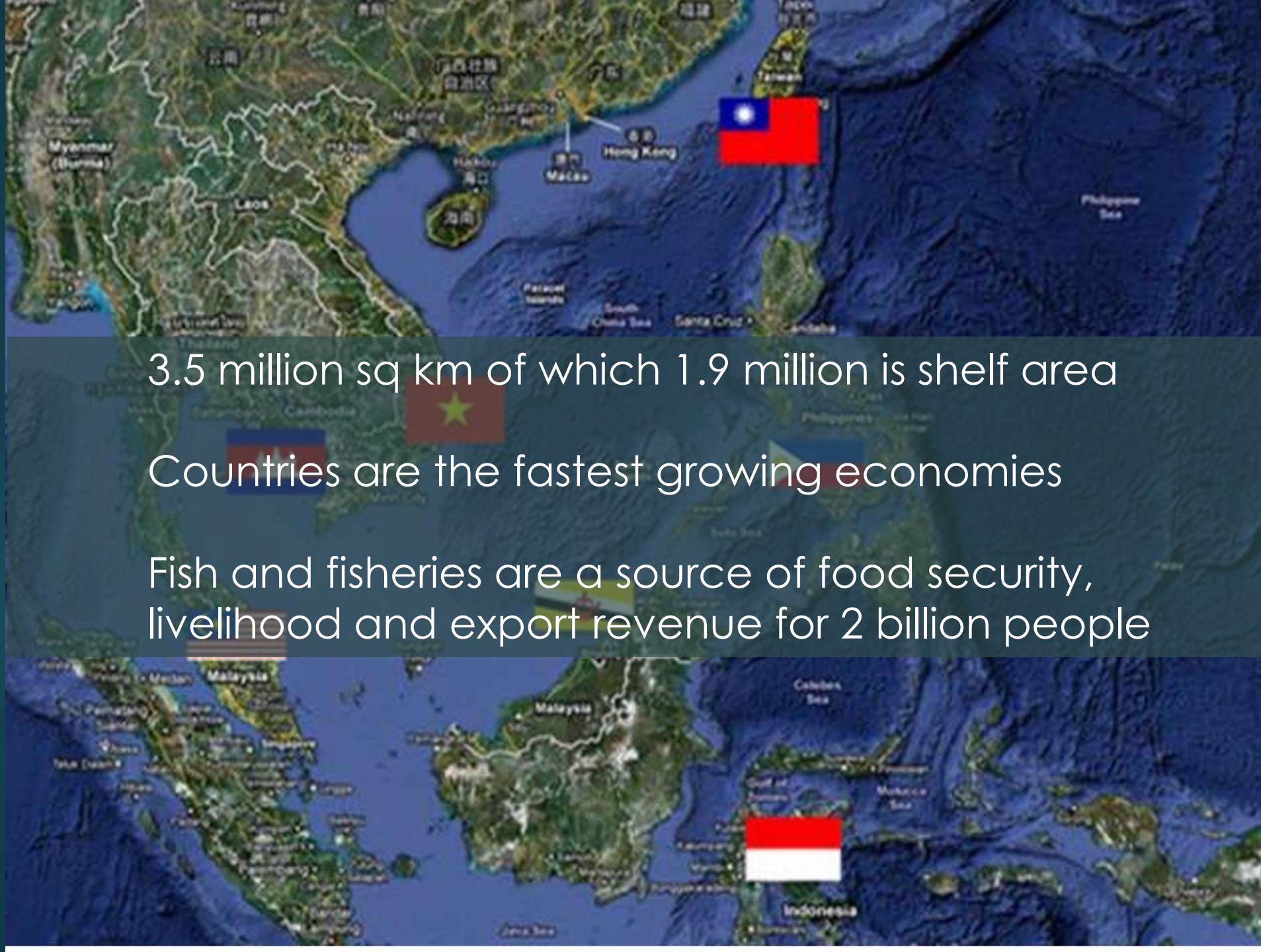
Converging on the Fisheries in the South China Sea

Ma. Carmen Ablan Lagman
Biology Department
Center for Natural Science and Environment Management De La Salle Universty,
ma.carmen.lagman@dlsu.edu.ph



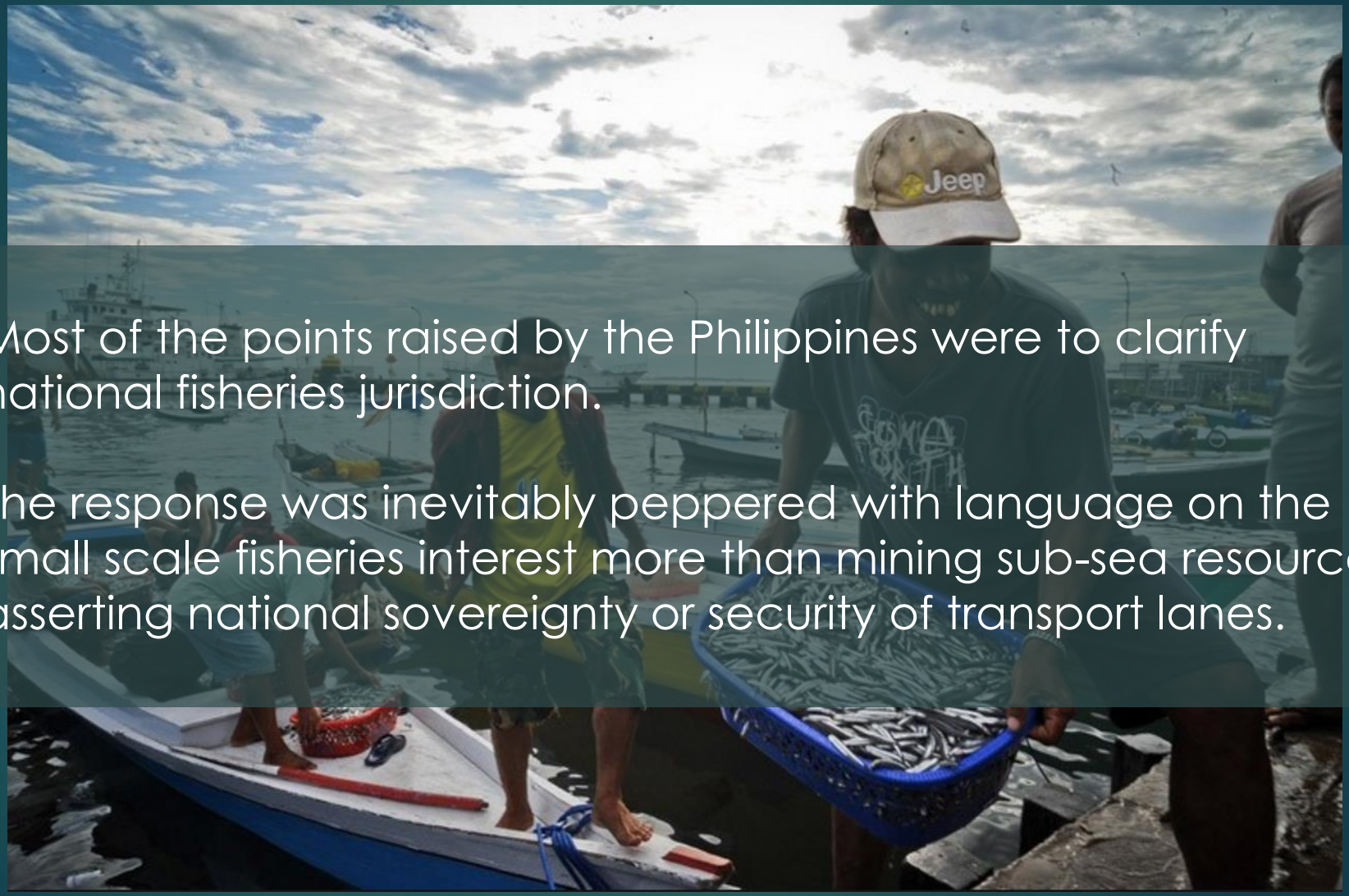
3.5 million sq km of which 1.9 million is shelf area

Countries are the fastest growing economies

Fish and fisheries are a source of food security, livelihood and export revenue for 2 billion people

The Philippines claims - Luzon Sea, the KIG in Palawan and the Panatag Shoal also known as Bajo de Masinloc or Scarborough Shoal.

China has taken over the Panatag Shoal and has built an artificial island on Kagitingan Reef and a lighthouse on Zamora Reef.

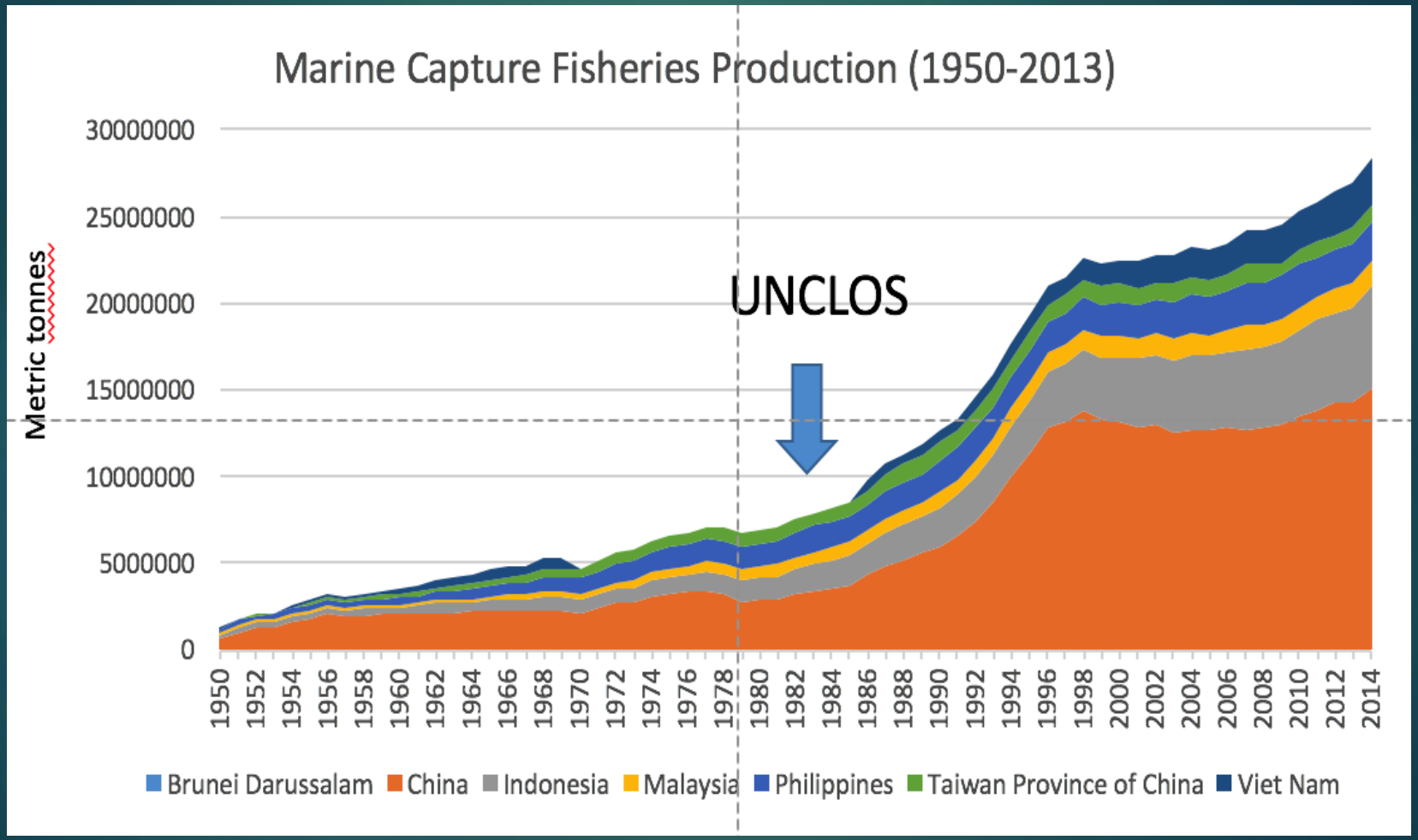


Most of the points raised by the Philippines were to clarify national fisheries jurisdiction.

The response was inevitably peppered with language on the small scale fisheries interest more than mining sub-sea resources, asserting national sovereignty or security of transport lanes.

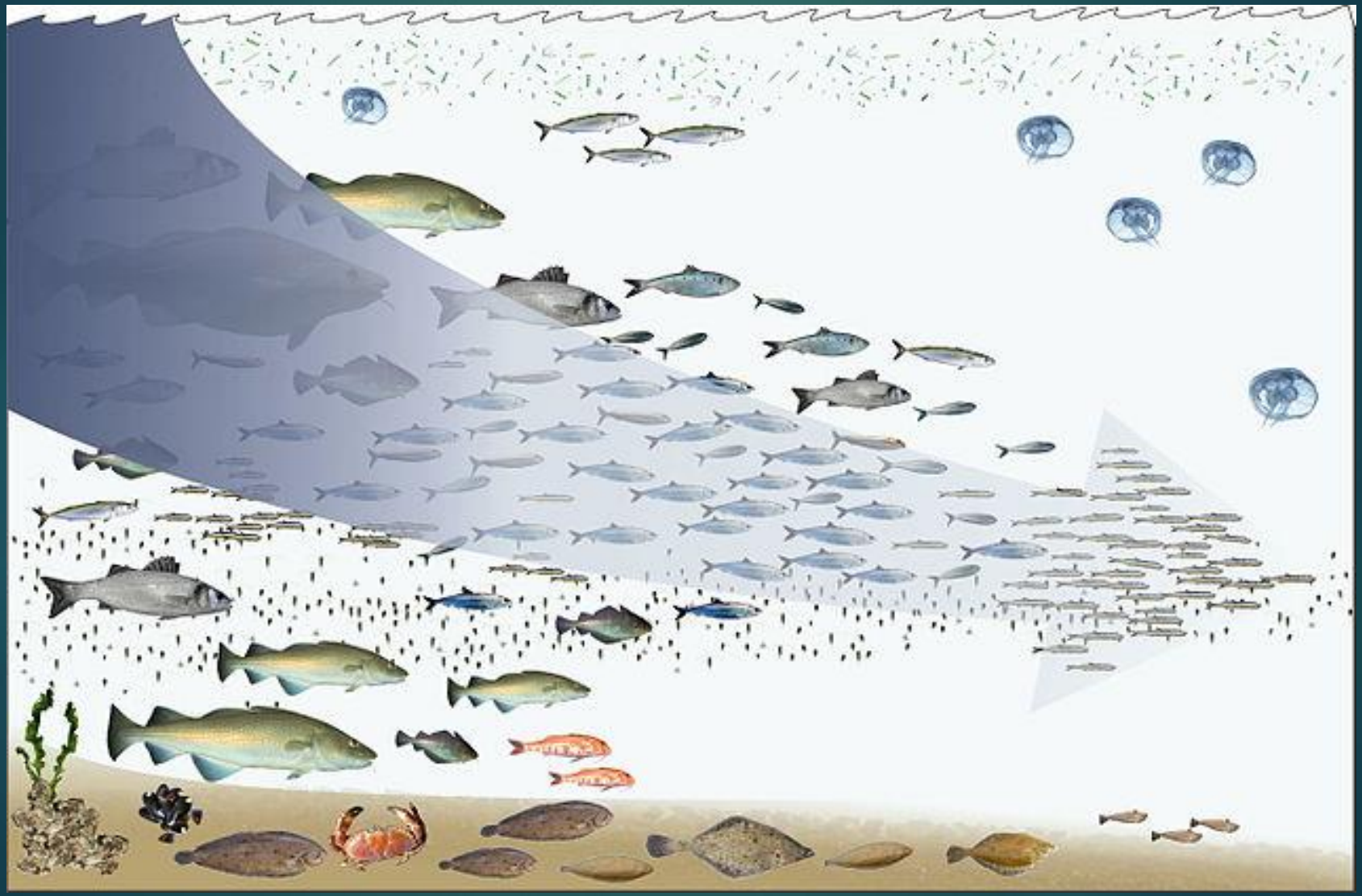

Maybe, brokering for cooperative agreements for a common dynamic resource on the ocean will be easier than agreements on ownership of islands and sub-surface features in the SCS


UNCLOS brought about a redistribution of benefits from fishing from distant water fishing fleets to the coastal states. And the shifting of capture fisheries production from the developed to the developing world.

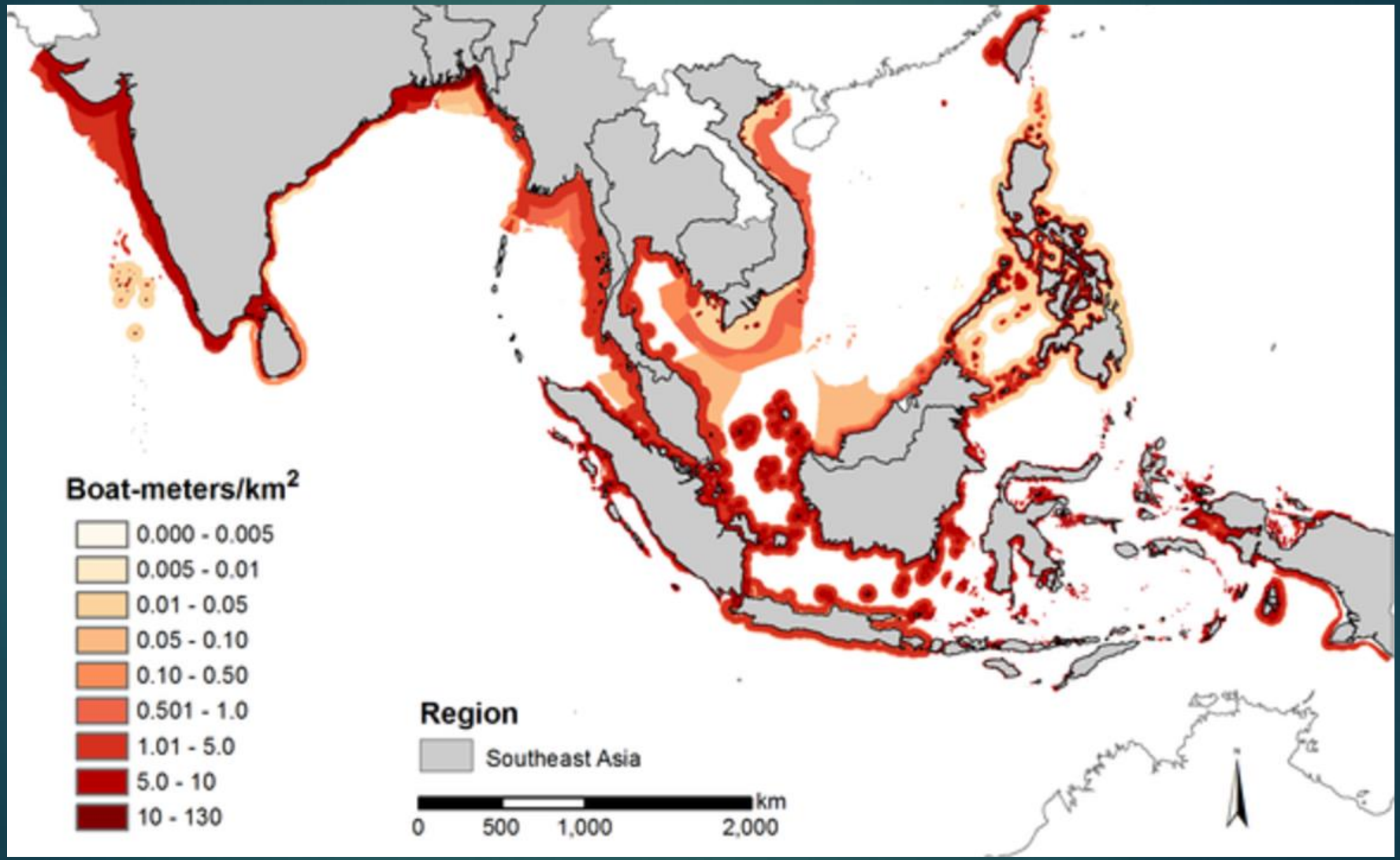

Marine Capture Fisheries Production (1950-2013)
Metric tonnes
30000000
25000000
20000000
15000000
10000000
5000000
0
UNCLOS
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
Brunei Darussalam
China
Indonesia
Malaysia
Philippines
Taiwan Province of China
Viet Nam

Rank	Country	Capture Fisheries Production (tons)
1	**China**	14,811,390
2	**Indonesia**	6,016,525
3	USA	4,954,467
4	Russian Fed	4,000,702
5	Japan	3,630,364
6	Peru	3,548,689
7	India	3,418,821
8	**Viet Nam**	2,711,100
9	**Myanmar**	2,137,350
10	Norway	2,301,288
11	**Philippines**	2,354,367
12	Republic of Korea	1,718,626
13	**Thailand**	1,559,746
14	**Malaysia**	1,458,126
15	Mexico	1,396,205
16	Morocco	1,350,147
17	Spain	1,103,537
18	Iceland	1,076,558
19	**Taiwan**	1,067,244
20	Canada	835,196
	WORLD	81,549,353

Fishing down the food web



Fishing effort across SCS

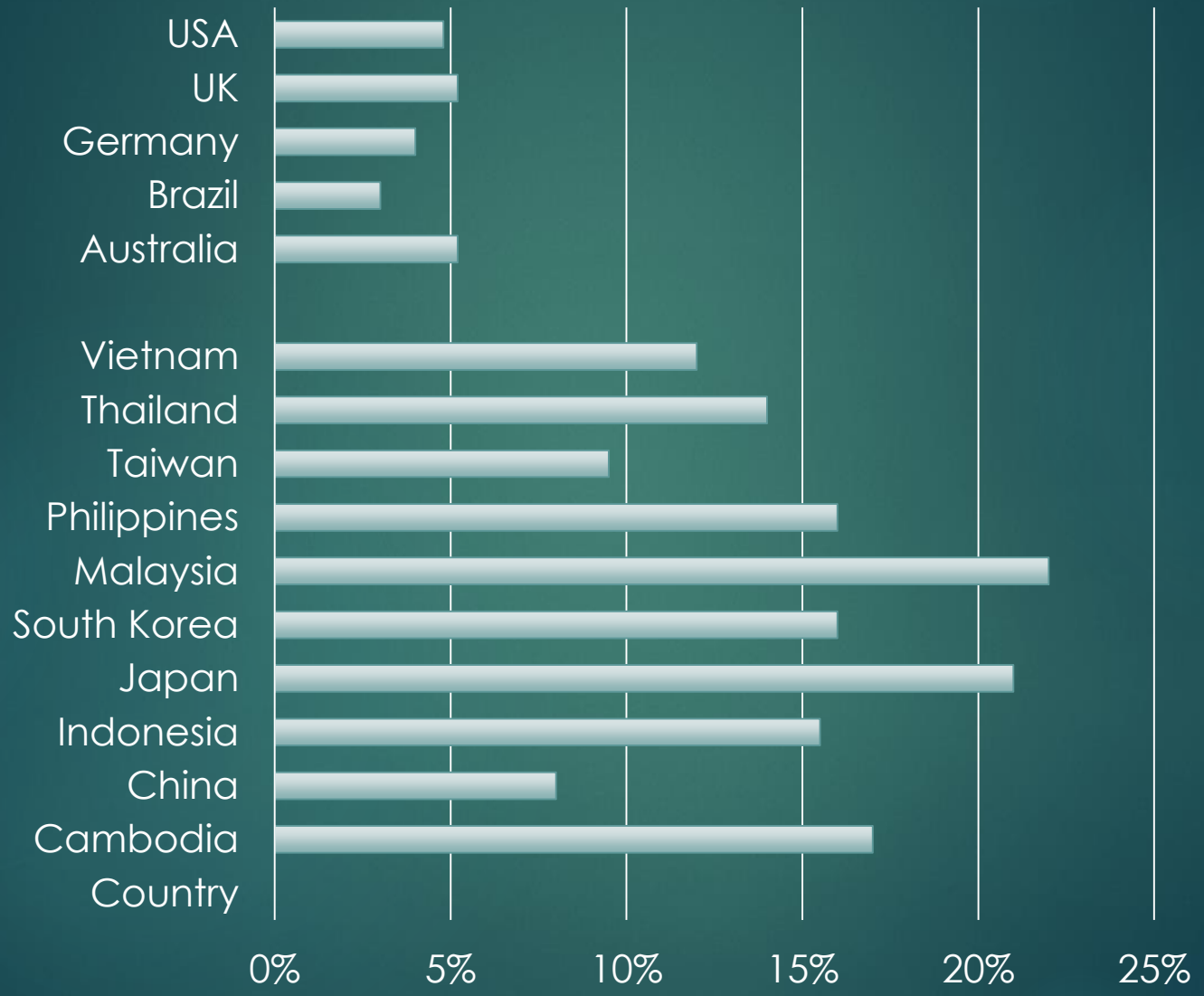


There are 3,365 species of marine fish in 265 families in the South China Sea . In contrast the Caribbean has 65 coral species and about 411 species of marine fish

Geographic Context

Country	Population	Per capita GDP	Land Area	EEZ	Continental Shelf Area (0-200 m depth)	
						As % of EEZ
	(millions)	(USD)	(x10^3 sq. km)	(x10^{3}sq. km)	(x10^3 sq. km)	(x10^{3}sq. km)
Brunei Darussalam	0.4	79,700	5.8	38.6	9.0	22.0
Cambodia	159.5	3,500	181.0	55.6	15.0	27.0
China	1,373.5	14,100	9,596.9	n.a	n.a.	n.a
Indonesia	258.3	11,100	1,919.4	5,408.6	2,777.0	51.0
Malaysia	31.0	26,300	329.8	475.6	374.0	79.0
Philippines	102.6	7,300	300.0	1,786.0	178.0	10.0
Taiwan	23.5	46,800	35.9	n.a.	n.a.	n.a
Thailand	68.2	16,100	514.0	257.6	86	33
Viet Nam	95.3	6,000	329.5	722.1	328.0	45.0

Fish in Asian diets



Nutrients and primary productivity

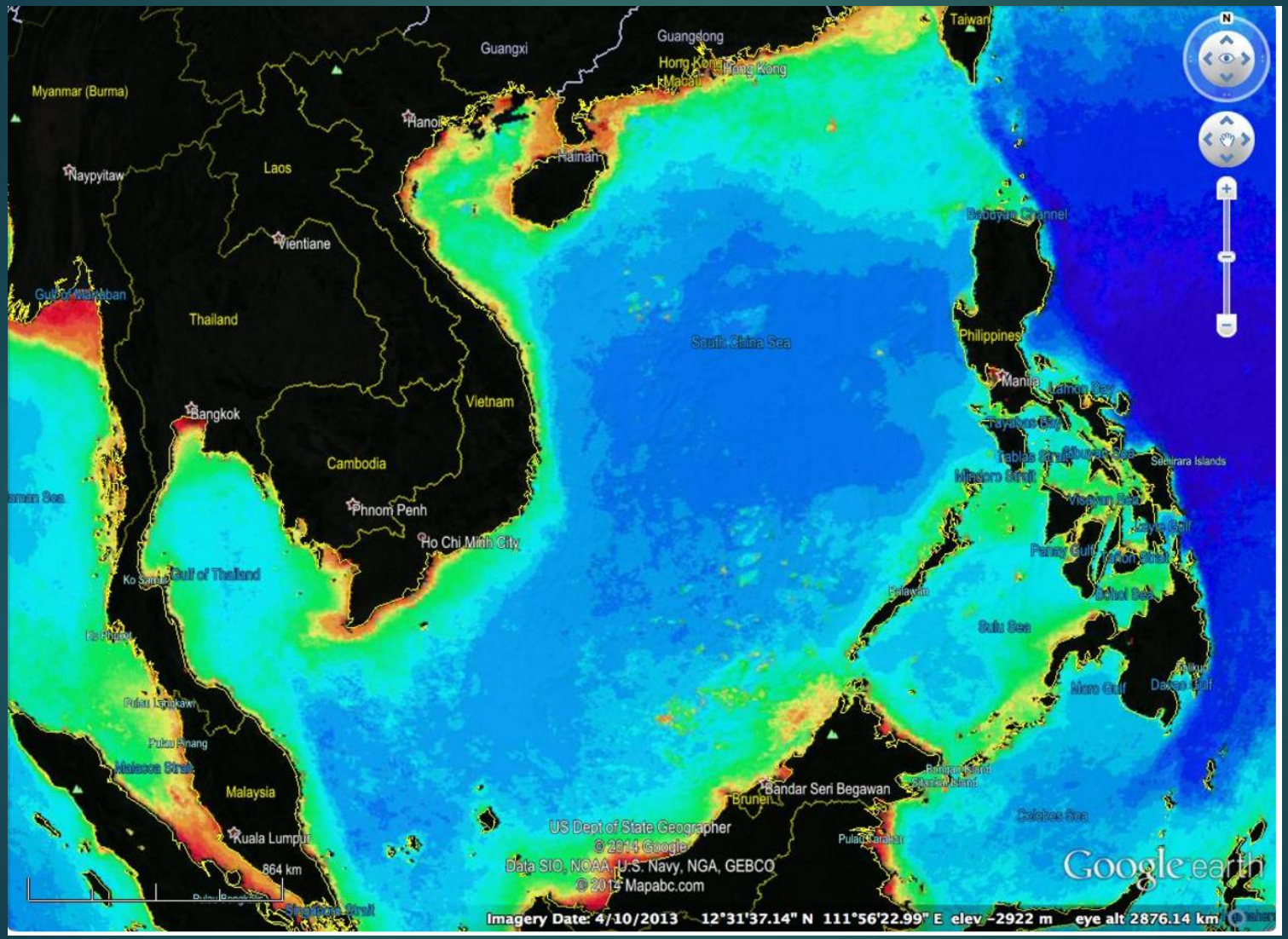
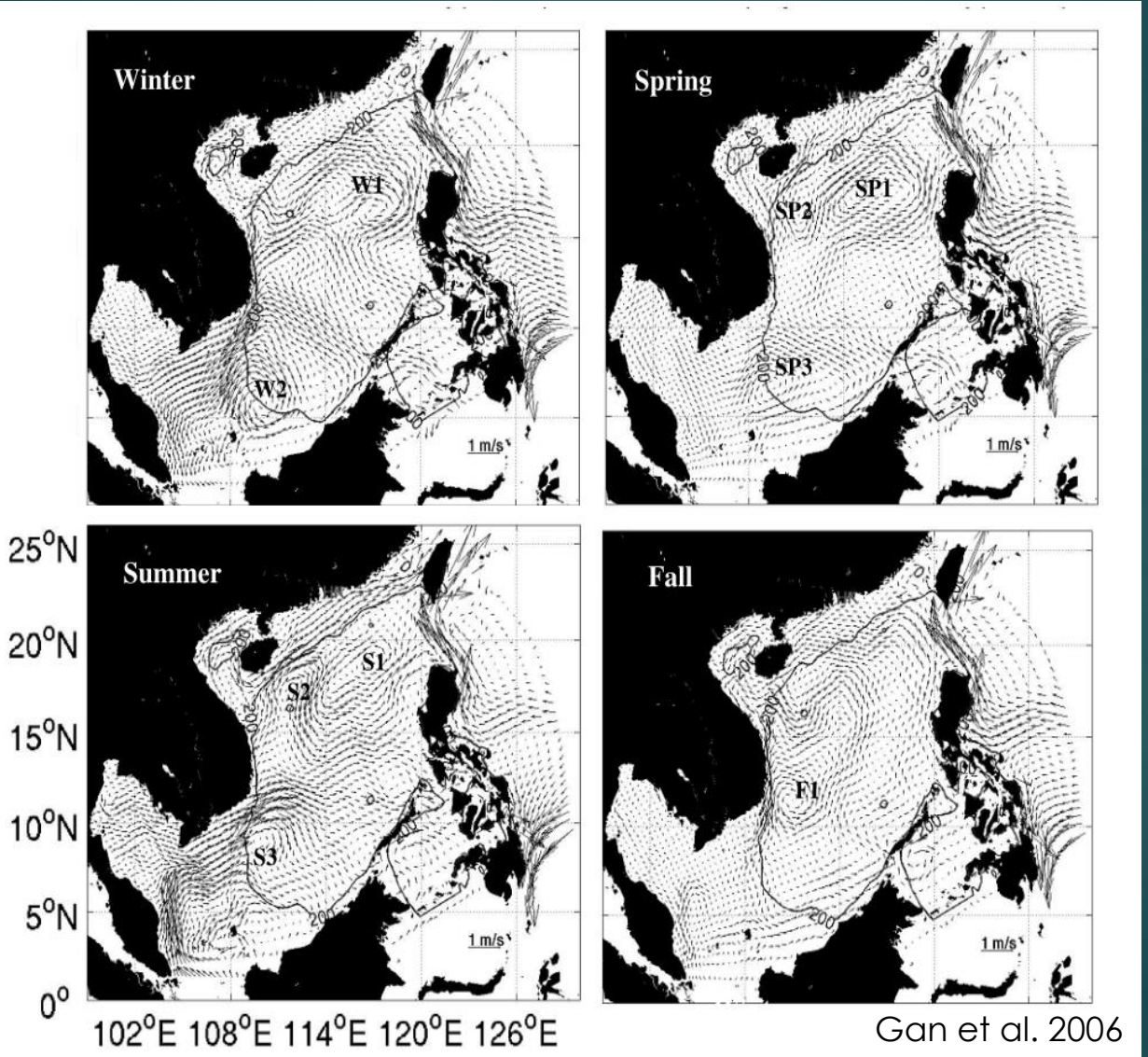


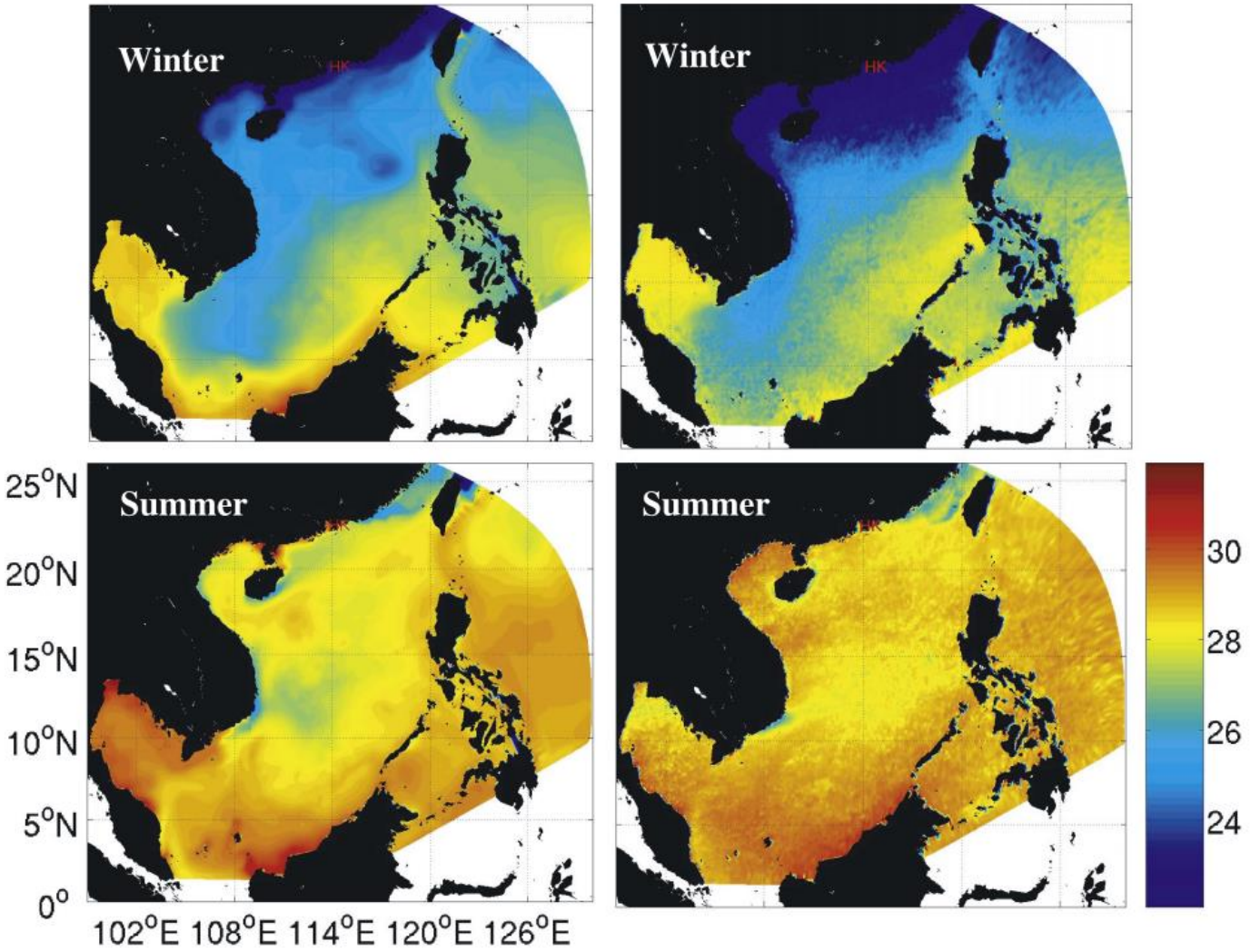
Image from talk given by Dr. Jay Batongbacal, Director UP Institute of Maritime Affairs and Law of the Sea

Monsoon patterns in the SCS



Gan et al. 2006

Temperature variation in the SCS



SCS mangroves and coral reefs

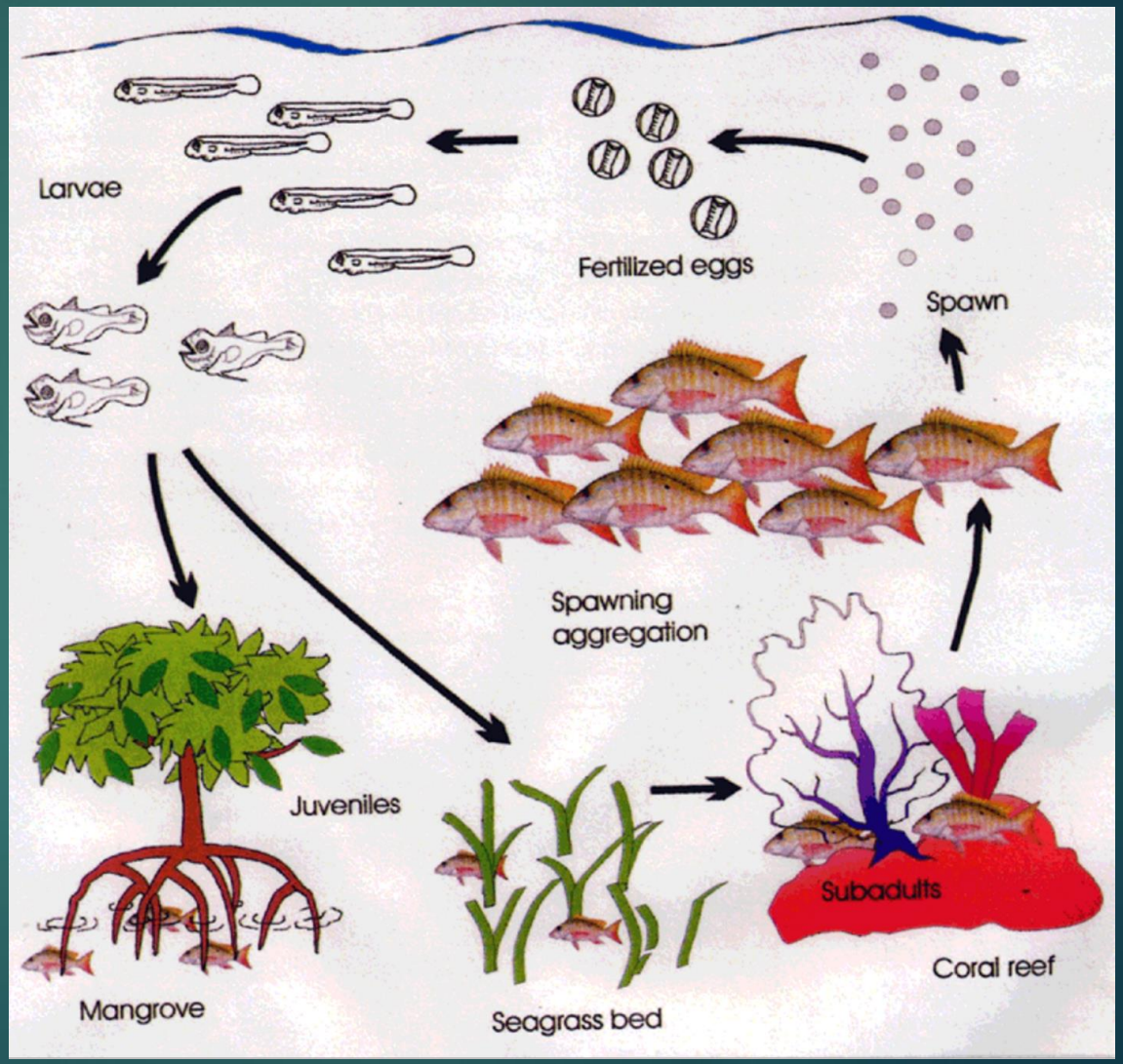
Country	South China Sea coral reef area (ha)	South China Sea Mangrove area (ha)
Cambodia	2,808	72,400
Indonesia	39,300	93,4000
Malaysia	43,400	-
Philippines	46,4000	28,000
Thailand	90,000	62,600
Vietnam	110,000	157,000
Total	750,000	1,770,000

Issue 1: Spatially explicit nature of fisheries management

	LARGE SCALE	SMALL SCALE
Number of fishermen employed	AROUND 500,000	OVER 12,000,000
Annual catch of marine fish for human consumption	AROUND 29 MILLION TONNES	AROUND 24 MILLION TONNES
Capital cost of each job on fishing vessels	$ 30,000-$ 300,000	$ 250-2,500
Fishermen employed for each $ 1 million invested in fishing vessels	5-30	500-4,000
Fish destroyed at sea each year as by-catch in shrimp fisheries	6-16 MILLION TONNES	NONE

http://www.fao.org/docrep/x3900e/x3900e03.htm

Issue 2: Interdependencies of the resource



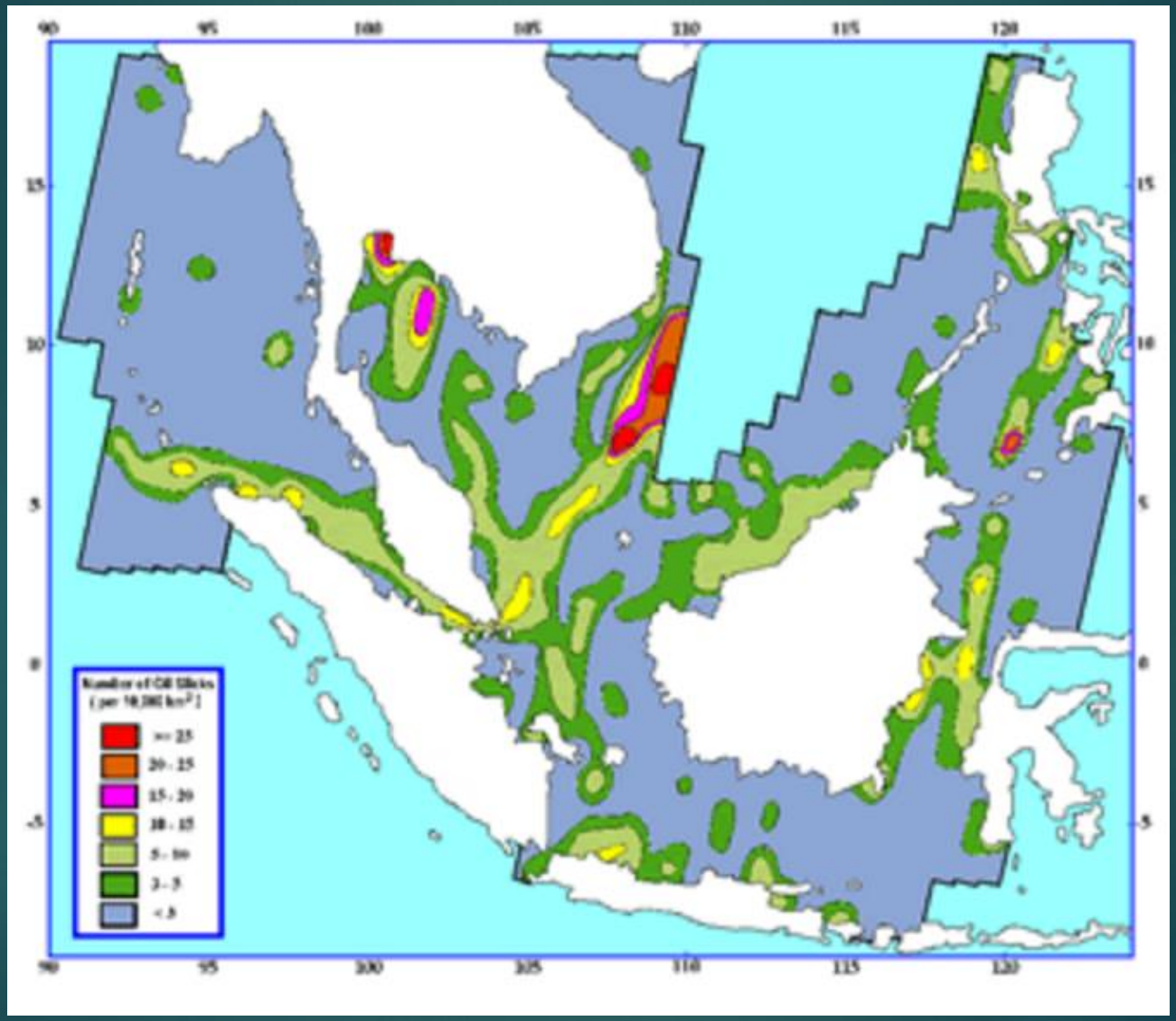
Case of the "Dalagang bukid"

Issue 3: Effects of Pollution and habitat destruction

https://crisp.nus.edu.sg/~research/oilspills/oilspills.htm

Oil spills

Oil spills in the SCS

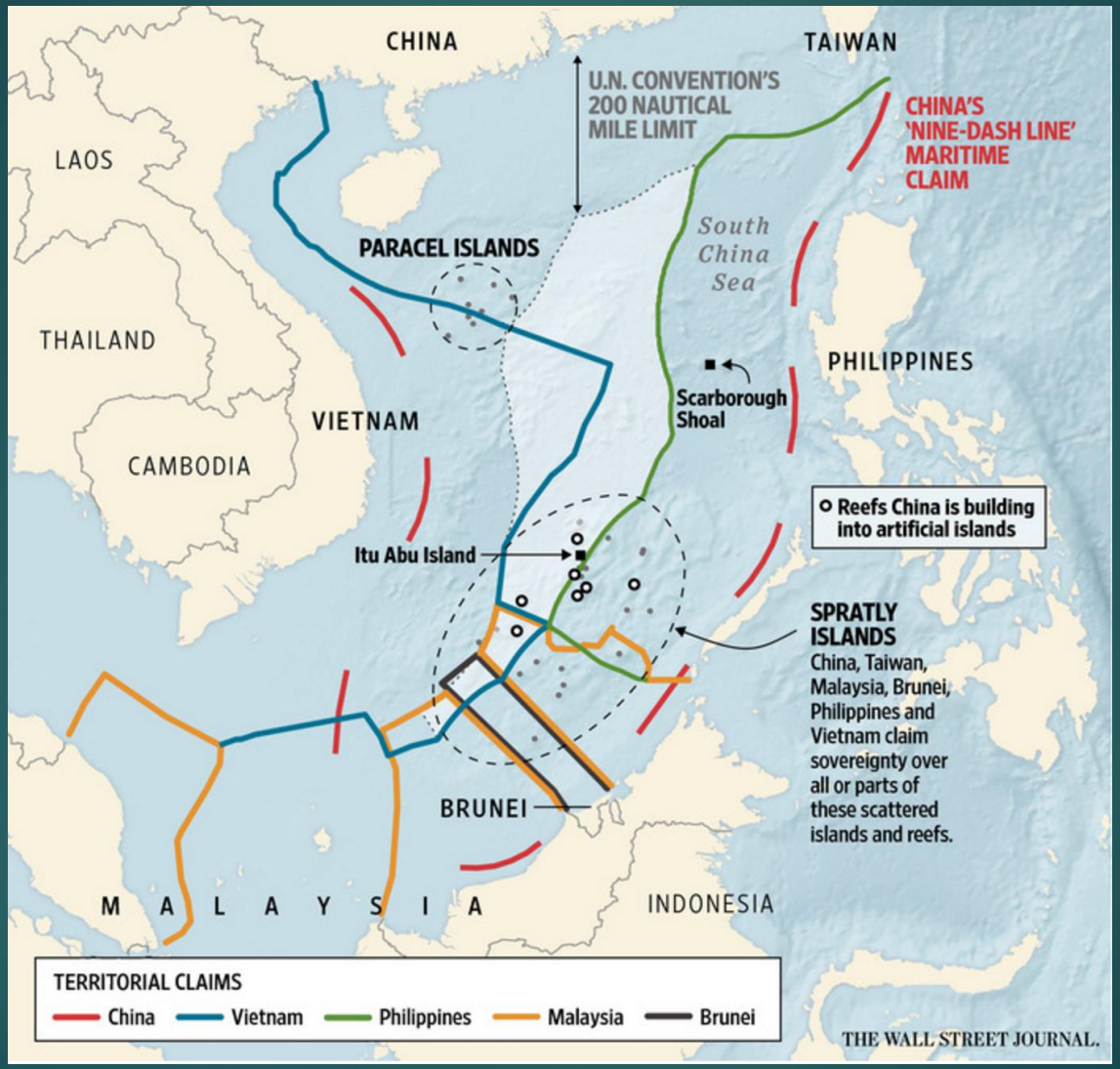


http://projects.inweh.unu.edu/inweh/inweh/content/StrategicActionProgrammes/pemseds_2003s.htmla_s


Dredgers pump sediment onto Mischief Reef, March 2015.
Dredgers
Sediment stream


January 2006

Issue 4: Limited resources to patrol



Home
Podcast
Blog
Subscribe
Video
Contributors
About Us
Invest With Us
Commodities
Economy
Energy
Global
Markets
Metals
Storm Watch

Fish: The Overlooked Destabilizer in the South China Sea

STRATFOR 02/12/2016

Print Like 0 Tweet G+1 0
A A

Forecast

- *South China Sea tensions will rise in the long-term as China exhausts its near-shore fisheries and continues to push outward to secure further stocks.*
- *In Asia, consumption of fish will increase with population and industrialization, boosting pressure on claimant countries to control their waters.*
- *Fishing vessels will continue to spark short, sharp crises and risk further upset to the delicate balance in Asia's disputed waters.*

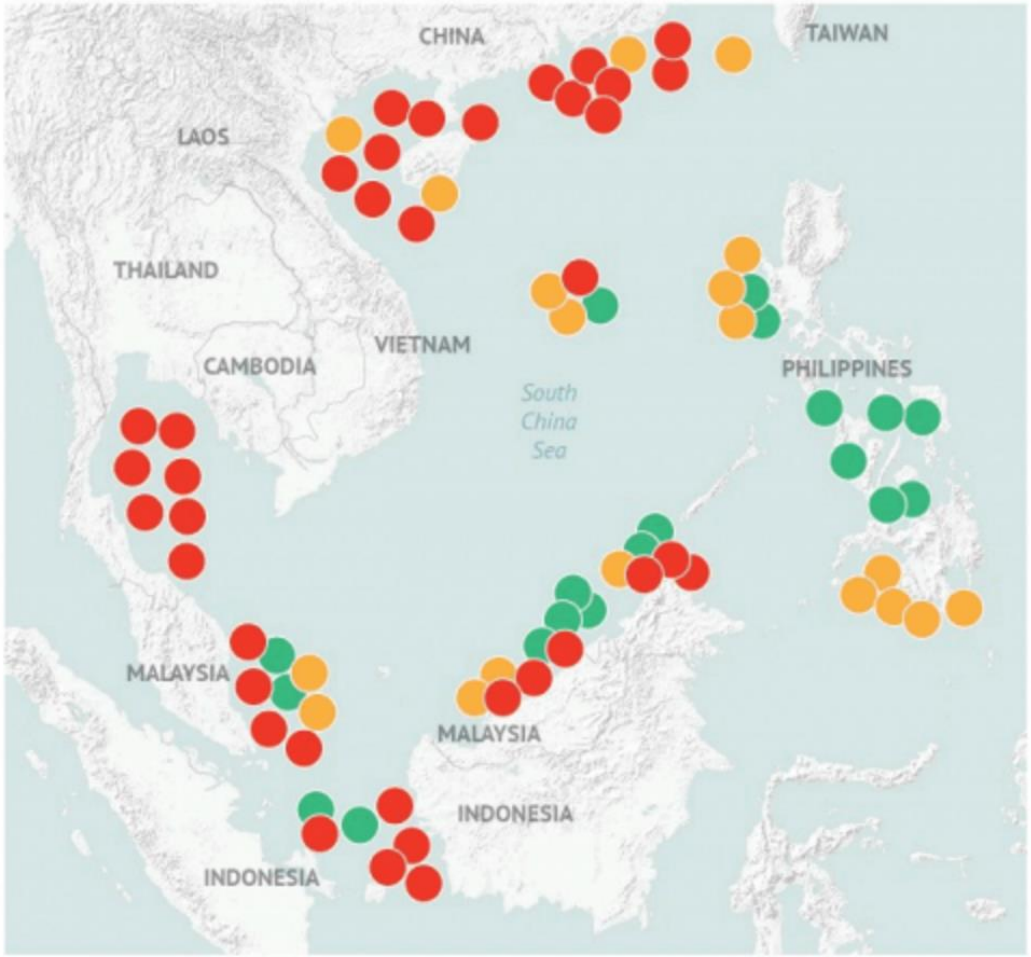
Analysis

China is pushing outward. The country has made steady moves to reclaim its role as the pre-eminent power in the Pacific Rim. This expansion, however, differs from those made at any other time in its history. For most of China's existence, it was a continental power endowed with sufficient resources with an economy driven by self-contained markets. External trade was a factor but moved mostly by land, primarily via the Silk Road. Sea trade also did occur, but

Sponsored
Travel Asia
Fishing Gear
Great Wall Tours
Great Wall Of China
Fishing In Alaska

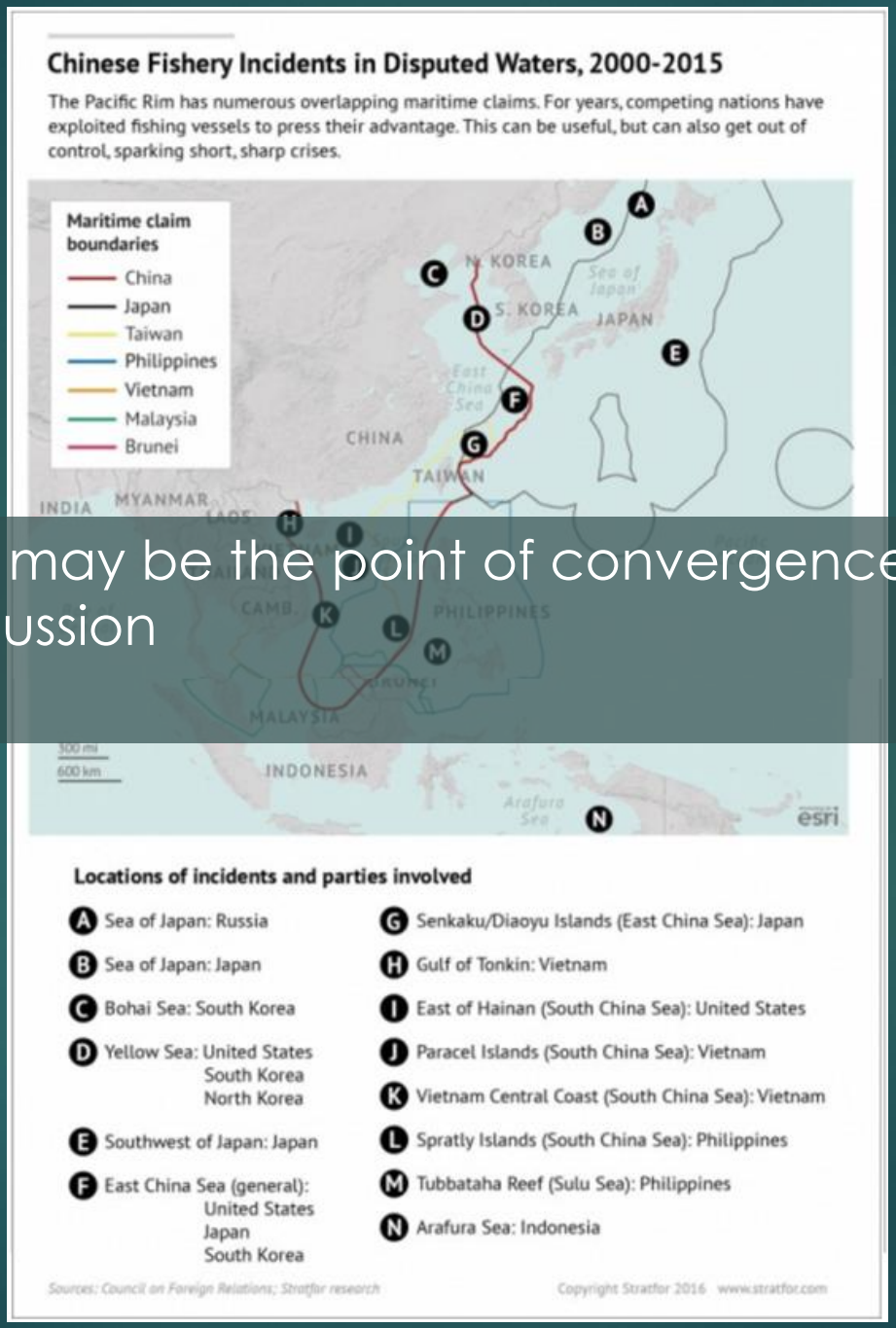
The South China Sea's Depleted Fisheries

Capture fishing since 1960 has led to a decline in the abundance of several species, especially along the Chinese coast. This has pushed fishing vessels farther out and into disputed waters.



Source: UN Food and Agriculture Organization

Copyright Stratfor 2016 www.stratfor.com



Fisheries may be the point of convergence in the South China Sea discussion

MacArthur Foundation

To Apply/Grantee Login › Search

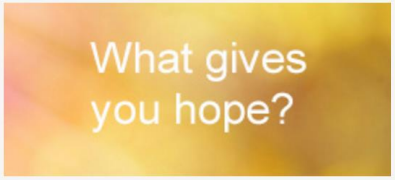
About Us | What We're Learning | Explore Our Grantmaking By Program By Topic By Location

REGISTRATION DEADLINE: SEPTEMBER 2

$100 Million Competition to Help Solve a Critical Problem of Our Time

LEARN MORE

Strengthening Police Accountability in Chicago ›



Our #ReasonsForHope ›

Chicago Program Cuts Arrests Among Youth ›

Chapter 9

Exclusive Economic Zones and the Management of Fisheries in the South China Sea

Ma. Carmen A. Ablan and Len R. Garces
WorldFish Center, Jalan Batu Maung Batu Maung Bayan Lepas Penang, Malaysia 11960
(*m.ablan@cgiar.org and l.garces@cgiar.org*)

1. INTRODUCTION

The 1982 United Nations Convention on the Law of the Sea (LOSC), with the provisions for defining an Exclusive Economic Zone (EEZ), is the international agreement that has had the greatest influence on the structure of fisheries policies in national and international arenas. It had the profound effect of increasing the contribution of fisheries to the national gross domestic product or GDP. It brought about a redistribution of benefits from fishing from distant water fishing fleets to the coastal states. Investments flowed in to the fisheries sector. Countries that had fisheries resources but limited capacity to exploit them established joint ventures with states that owned fishing fleets (ADB, 1997). The end result was a substantial increase in the contribution of fisheries to the national GDP especially in developing countries and the overall shift in total capture fisheries production from the developed to the developing world (Delgado et al., 2003).

The LOSC and the EEZ are strongly associated with ownership and the implication that fisheries will be better managed within some property rights regime. These concepts were modified by coastal states to apply to fisheries management policies at the scale of local governments and even communities. Shortly after the Third United Nation's Conference on the Law of the Sea ended in 1982, community-based initiatives to define fishing rights and effectively manage fisheries proliferated. There was a stronger effort to move national policy toward devolution of fisheries management to local government units and encourage co-management and stakeholder participation in the management of coastal resources. There were several efforts to develop Integrated Coastal Zone Management (ICZM) Plans and establish Community Based Coastal Resource Management (CBCRM) strategies in the Philippines first, and later in Indonesia, Thailand, Malaysia and Vietnam.

In this paper, we present case studies where there is a poor institutional fit between the EEZs of coastal states and the natural structure of fisheries resources. This has led to the formulation of inadequate fisheries policies, difficulties in monitoring and controlling the overexploitation of fish stocks, and a massive degradation of fish habi-

S.A. Ebbin et al. (eds.), A Sea Change:
The Exclusive Economic Zone and Governance Institutions for Living Marine Resources, 136–149.
© 2005 *Springer. Printed in the Netherlands.*

Meso-scale Transboundary Units for the Management of Coral Reefs in the South China Sea Area

M.C.A. Ablan, J.W. McManus, C.A. Chen, K.T. Shao, J. Bell, A.S. Cabanban, V.S. Tuan and I.W. Arthana

Abstract

Local communities and local government units are recognized as the primary stakeholders and participants in the management of coral reef resources and the primary beneficiaries of small-scale fishing activities in the nearshore areas of the coastal zone. The issues relating to the management of the coastal zone are multi-faceted and some issues are largely intertwined with national policy and development goals. Thus, national governments have jurisdiction over these nearshore coastal resources to harmonize policies, monitor resource use and provide incentives for sustainable use. However, the natural boundaries of these reef resources, the processes that support reef ecosystems, and the local or national affiliation of the people who benefit from them may transcend the boundaries of the local and national management units. Therefore, efforts to arrest the decline in fish catch and loss of biodiversity for reefs require management interventions and assessment activities to be carried out at varying scales. In Southeast Asia, some aspects of reef and reef resources management — particularly in deciding the allocation of catch among competing fisheries, development of sustainable harvest strategies, use of broodstock for restocking or stock enhancement programs, protection of nursery and spawning areas, designation of systems of marine protected areas, and the identification of representative, adequate and comprehensive areas for biodiversity conservation in the region — may require the definition of larger management units. At the regional level, multi-country initiatives will need to define units for the transboundary management of resources. The use of large marine ecosystems (LMEs) to identify and manage fisheries resources may be a starting point; however, given the relatively sedentary nature of coral reef-dwelling and reef-associated organisms compared with other pelagic and demersal species, meso-scale transboundary units within the LMEs have to be defined. This paper provides suggestions for transboundary management units for coral reef and reef-associated resources in Southeast Asia based on information from genetic structures of model organisms in the region. In addition, specific reef areas are identified, which may be important beyond their national boundaries, as potential sources of recruits.

Introduction

Much of the biodiversity and reef fisheries resources in Southeast Asia are unlikely to survive without active management. Coral reefs of the region are the most threatened with more than 80% at risk primarily from coastal development and fishing-related pressures (Bryant et al. 1998). Millions of coastal dwellers rely on reef resources for food and livelihood. As economies continue to grow and demands on the environment multiply, degradation and unsustainable use of this resource also increase.

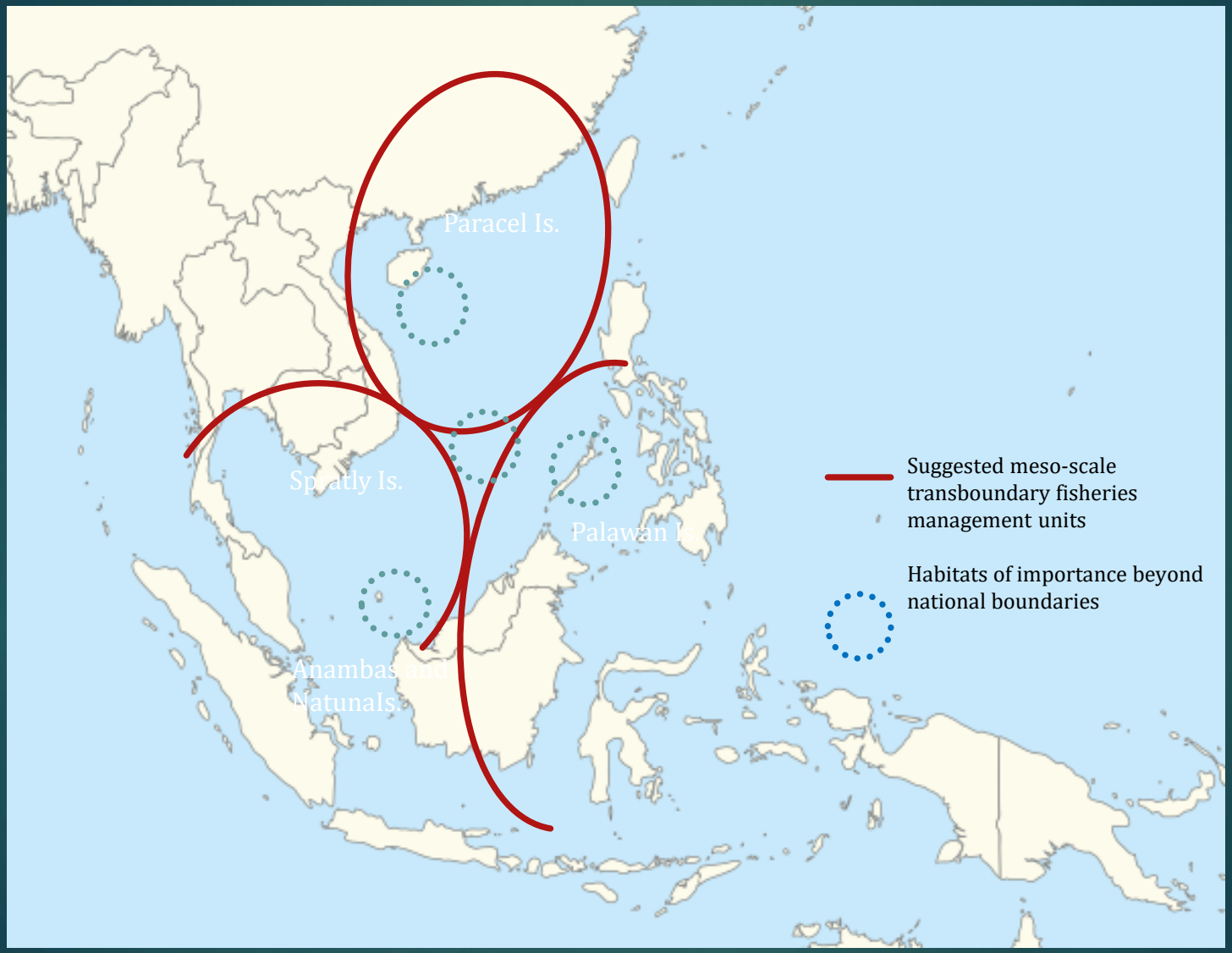
Coastal communities in Southeast Asia are heavily dependent on fisheries. Catch from the reef fishery is estimated to comprise up to 20-25% of the total production from marine fisheries in countries like the Philippines and Indonesia (McManus 1997). Longhurst and Pauly (1987) have documented the occurrence of overfishing in east Malaysia, the Philippines, Vietnam and southern China. Reports show that the maximum sustainable yield (MSY), the limit reference point beyond which immediate and substantial action should be taken to protect harvested stock (Caddy and Csirke 1983), has already been exceeded for demersal (Silvestre et al. 1987), pelagic (Dalzell and Ganaden 1987; Trinidad et al. 1993) and reef fisheries (McManus and Meñez 1997) in the Philippines. Similar cases occur elsewhere in the region but are less well documented. The situation is apparently the same in Vietnam (Long in press) and eastern Malaysia (Abu Talib et al. in press) as growing populations turn to fishing as a source of livelihood.

Aside from being unsustainable, overfishing in the region has implications for species diversity and abundance for both pelagic (Christensen 1998) and reef fisheries (McManus 1992). Biodiversity loss due to harvest is apparent in the local-scale extinctions of reef-associated species such as the sea urchin *Tripneustes gratilla* (Talaue-McManus and Kesner 1995) and the giant clams *Tridacna derasa* and *Tridacna gigas* (Meñez et al. 1997).

Reef Connectivity and Implications for Management

Conceptually, rehabilitation and sustainability of a reef subject to intense fishing pressure hinge on the availability of new recruits and their

SOLUTION 1: Transboundary mgt un



Outputs – PhilFishConnect

www.philgenesconnect.com/fish/results/

PHILFISHCONNECT

ABOUT PARTNERS SPECIES OUTPUTS NEWS KNOWLEDGE PRODUCTS

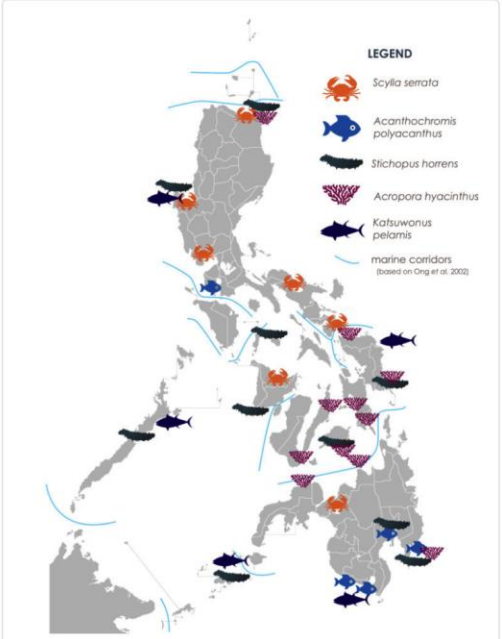
Outputs

Research findings

Population structures

- Discontinuous gene flow is apparent in spite of the high movement due to aquaculture, as in the case of *Scylla serrata* (mud crab).
- Population structure in *Stichopus horrens* (sea cucumber) also followed designated Key Biodiversity Areas based on species diversity.
- Geographical barriers further restricted gene flow between populations of *Acanthochromis polyacanthus* (spiny chromis damselfish), manifested by differences in the morphology of each population.
- Eleven (11) microsatellite markers in five populations of *Katsuwonus pelamis* (skipjack tuna) were amplified. Manuscript is being prepared.
- For *Acropora hyacinthus*, 12 microsatellite markers were read in 11 populations of the coral. Manuscript is being prepared.

Species identification



Sampling sites all over the Philippines

Skipjack Tuna

Sea Cucumber

Spiny Chromis Damselfish

Table Coral

PARTNERS

De La Salle University

National Fisheries Research and Development Institute

UP Marine Science Institute

University of the Philippines Mindanao

Silliman University Institute of Environmental and Marine Sciences

META

Log in

Entries RSS

Comments RSS

There are 3,365 species of marine fish in 265 families in the South China Sea . In contrast the Caribbean has 65 coral species and about 411 species of marine fish

Solution 2: International Agreements

FAO Reykjavik Declaration 2001

FAO Code of Conduct for Responsible Fisheries 1995

Agenda 21 1992

Agreement Relating to the Conservation an Management of Straddling Stocks 1995

Thank you

- John McManus, AEP Leader ,WorldFsh Center
- Meryl Williams, Director General, WorldFish Center
- Peter Gardiner, Deputy Director General, WorldFish Center
- Vo Si Tuan, Institute of Oceanography Nha Trang, Vietnam
- Padermsak Jarayabhand, Chulalongkorn University, Thailand
- Choulon Allen Chen, and Kwang Tsao Shao
  Academia Sinica, Taiwan ROC
- Johann Bell, WorldFish Center
  Pacific Office, Honiara Solomon Is.
- Suharsono, LIPI Indonesia
- Annadel Cabanban and Maybelle Matsumoto
  University of Malysia Sabah, Malaysia
- Chona Camille Vince Cruz-Abelledo, DLSU
- Rachel Ravago-Gotanco and Apollo Lizano
  UP Marine Science Institute
- Hilconida Calumpong and Oliver Paderanga
  Silliman University
- Mudjiekeewis Santos and Roselyn Aguila
  National Fisheries Research and Development Authority
- Cleto Nanola, Catherine Otero and Leslie Bernolo
  UP Mindanao

Thank you!