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Major Threats to Marine Environment and Regional Cooperation in Semi-enclosed Seas: A South China Sea Perspective

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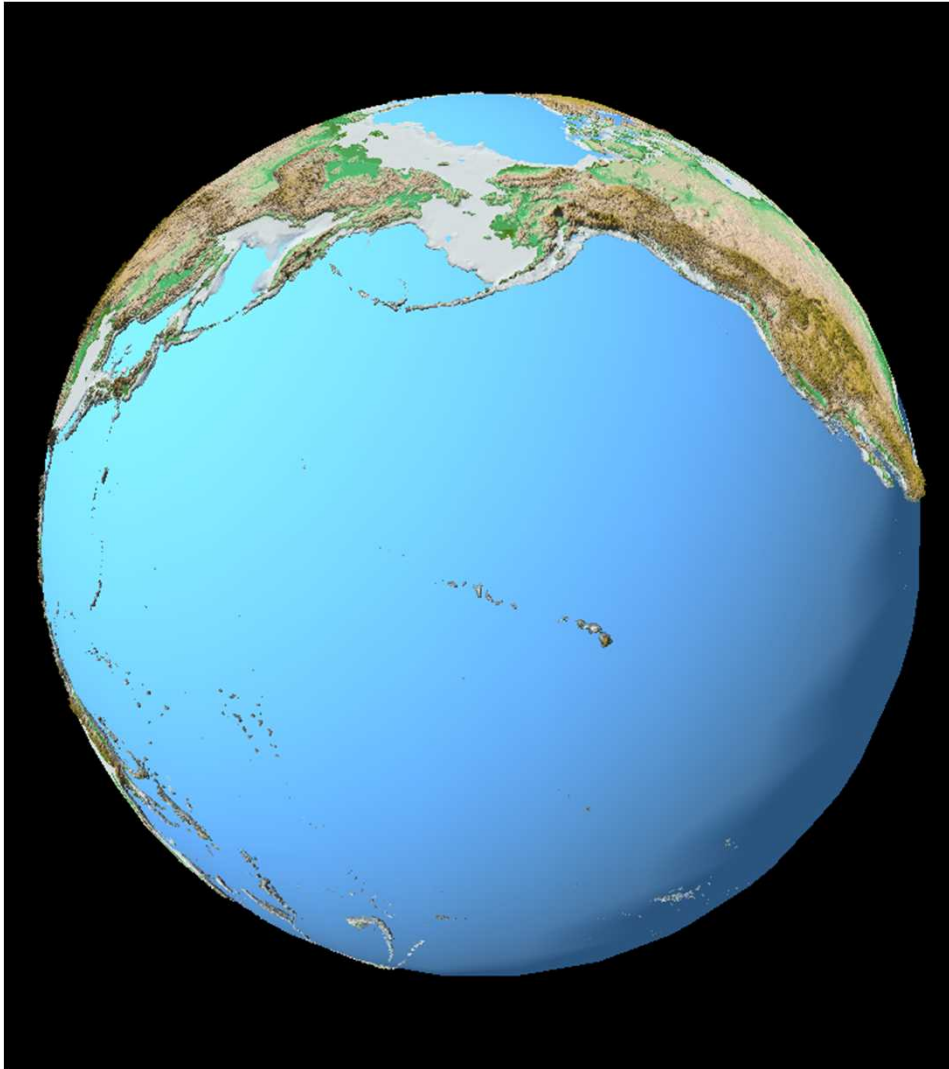


Outlines

- I. Major Threats to Marine Environment
- II. Necessity to Cooperate for Marine Environmental Protection
- III. Duty to Cooperate in the South China Sea
- IV. Emerging Environmental Challenges in the South China Sea
- V. Implications for the South China Sea States
- VI. Concluding Remarks and the Way Forward



Significance of Marine Environment



- Cover 72% of Earth's Surface
- Contain 97% of World's Water
- Host 90% of Living Biomass
- Play a Fundamental Role in the Carbon Cycle,
- Key to Greenhouse Effect and Climate Stability



I. Major Threats to Marine Environment

- ④ Nature:
 - Natural disasters;
 - Global warming;
 - sea level rise etc.
- ④ Human activities:
 - constructions;
 - industries
 - life style etc.
- ④ Affectd areas
 - Water column
 - Coastal zone areas
 - Ecosystem
 - Seabed





I. Major Threats to Marine Environment

- ④ People enjoy the beauty of the ocean and the bounty of its waters in many ways.
- ④ Trans-boundary environmental problems
 - The Law of Ecology: "everything is connected to everything else".
 - Most environmental problems are transnational in nature and linked to issues of sustainable development.
- ④ Pollution does not confine itself to political boundaries
 - Neither pollution nor their effect honor borders, cross-border issues can become very problematic.
- ④ The challenge is more daunting when facing the climate change induced sea level rising.



Natural Disasters Recorded

Almost every day, disasters occur somewhere in the world, with devastating consequences and enormous suffering for those affected

In Asia:

- ④ Floods, 47 % (2011)
 - Steady / Fluctuating 2002 - 2011
- ④ Total, Asia, 41.8 % (2011)
 - Slowly decreasing 2002 - 2011
- ④ Deaths in Asia, 77 % (2011)
 - Fluctuating 2002 - 2011
- ④ Affected Population
 - Asia, 84.2 % (2011)
 - Decreasing 2002 - 2011
- ④ Cost of Damage,
 - Asia: 74.4 % (2011)
 - Fluctuating 2002 - 2011





I. Major Threats to Marine Environment -- Sources of Pollution

1. Land based
2. Dumping
 - Dredgings, sewage, industrial waste, radioactive water
 - Deliberate
3. Vessel sources
4. Off-shore activities
 - ⊙ Shipping & Navigation
 - ⊙ Continental Shelf Minerals
 - Oil & Gas
 - Others
 - ⊙ Fisheries & Interests of various industries





Land based Pollution

- ④ 80.5%: nutrients, sediments, sewage, hydrocarbons (oil), heavy metals, organochlorines, litter
- ④ Deliberate management of catchments, sewage, waste, agrochemicals, fumes
 - nutrients from sewage outfalls and urban drainage
- ④ Note:
 - Especially threaten **semi/enclosed seas** due to slow circulation of water exchange and more fragile system;
 - Heavy financial burden and infrastructure changes
 - Not all countries were created equally, with varying levels of economic development, population, geographic characteristics, cultural, historical, political, and social priorities.
- ④ These factors influence how countries cooperate in marine environmental protection





Halons

**CO₂, SO_x,
NO_x, PM**

Incinerator

Ship Recycling

CFC

Anodes

Noise

Bilge Water

Sludge

Detergents

TBT

Ballast Water

Tank
Washing

Cargo
Residue

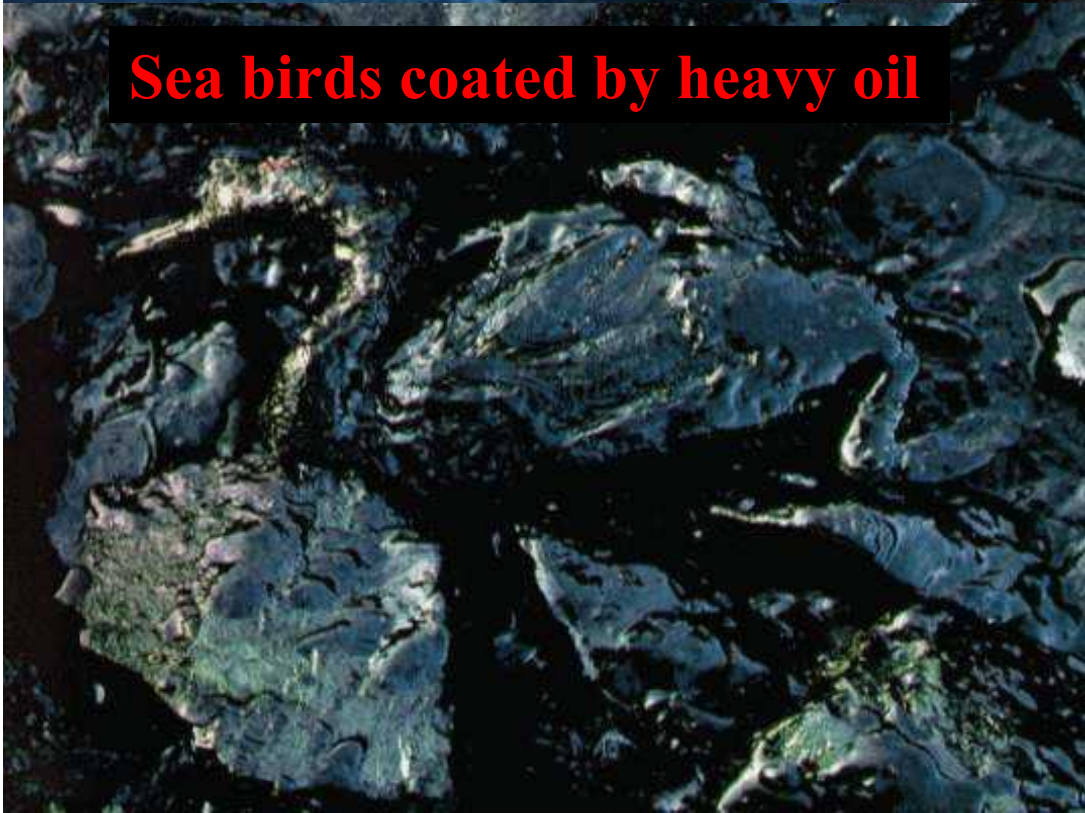
Detergent

Cleaning
Agents

Garbage



Sea birds coated by heavy oil





II. Necessity to Cooperate for Marine Environmental Protection

- ④ The effects of pollution are global/regional in nature.
 - Pollution in a particular country has a cascading effects in other countries or regions
 - The affected countries could be economically and socially affected

- ④ Coordination and cooperation at regional level is essential.
 - Concerted and coordinated efforts at regional and level could significantly reduce losses to life and property
 - Countries have to work together to solve their problems common interests.
 - Increased cooperation and strengthened efforts in preparedness is necessary



II. Necessity to Cooperate for Marine Environmental Protection

- ④ Environmental realities do not coincide with political and administrative boundaries.
- ④ Cooperation is a multi-sector activity, and requires a wide range of commitment.
- ④ Cooperation is an obligation and a **MUST**
- ④ Working in isolation may result in reduced effectiveness
- ④ Coordination is a two way traffic to effectively address & mitigate the effects of pollution



II. Internatoinal Regime for Marine Environmental Protection

The duty to cooperate constitutes a fundamental principle of international law

Prescriptive ← Enforcement Jurisdiction

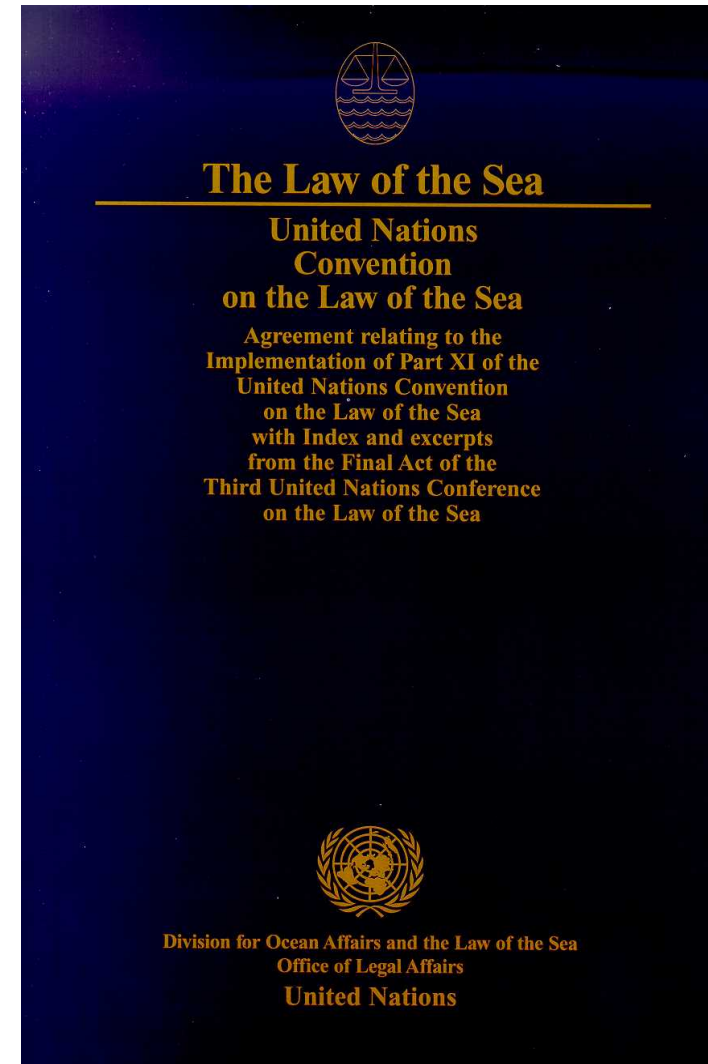
- Operational Standards
- Safety Standards
- Compliance
- Enforcement
- Intervention
- Emergency Cooperation
- Liability





II. Internatoinal Regime for Marine Environmental Protection

- Largely under state control
- Global Framework
- Article 123 of the 1982
UNCLOS: Cooperation of States bordering enclosed or semi-enclosed seas





Article 123 of the UNCLOS

States bordering an enclosed or semi-enclosed sea **should cooperate** with each other in the exercise of their rights and in the performance of their duties under this Convention. To this end they **shall endeavour**, directly or through an appropriate regional organization:

- (a) to coordinate the management, conservation, exploration and exploitation of the living resources of the sea;
- (b) to coordinate the implementation of their rights and duties with respect to the **protection and preservation of the marine environment**;
- (c) to coordinate their scientific research policies and undertake where appropriate joint programmes of scientific research in the area;
- (d) to invite, as appropriate, other interested States or international organizations to cooperate with them in furtherance of the provisions of this article.



SCS: Characteristics and Basic Facts

- ⦿ Geographic scope: 1953 IHO definition: Gulf of Thailand
- ⦿ Semi-enclosed bordered by 9 States
- ⦿ Overlapping territorial claims
- ⦿ Maritime superhighway
- ⦿ Vital economic importance
- ⦿ World's richest marine biodiversity areas
- ⦿ Shared fish stocks or highly migratory species



III. Duty to Cooperate in the SCS

Article 74/83 UNCLOS

Pending agreement as provided for in paragraph 1, the States concerned, in a spirit of understanding and cooperation, shall make every effort to enter into provisional arrangements of a practical nature and, during this transitional period, not to jeopardize or hamper the reaching of the final agreement. Such arrangements shall be without prejudice to the final delimitation.

Declaration on Conduct of the Parties in SCS 2002 (“DOC 2002”).



III. Duty to Cooperate in the SCS

Para. 6 of DOC 2002:

Pending a comprehensive and durable settlement of the disputes, the Parties concerned may explore or undertake **cooperative activities**.

These may include the following:

- a. **marine environmental protection;**
- b.

The modalities, scope and locations, in respect of bilateral and multilateral cooperation should be agreed upon by the Parties concerned prior to their actual implementation.



IV. Environmental Challenges in the SCS

Enduring problems related to the usage of marine environment have not been resolved to any satisfaction due to:

- ④ Commitment to territorial disputes
- ④ Lack of Agreed maritime boundaries
 - Search for "fences in the sea"
- ④ Regional geography and political complexity
- ④ Lack of support for relevant international organisations
- ④ Lack of capacity in some coastal states

Environmental Conflicts

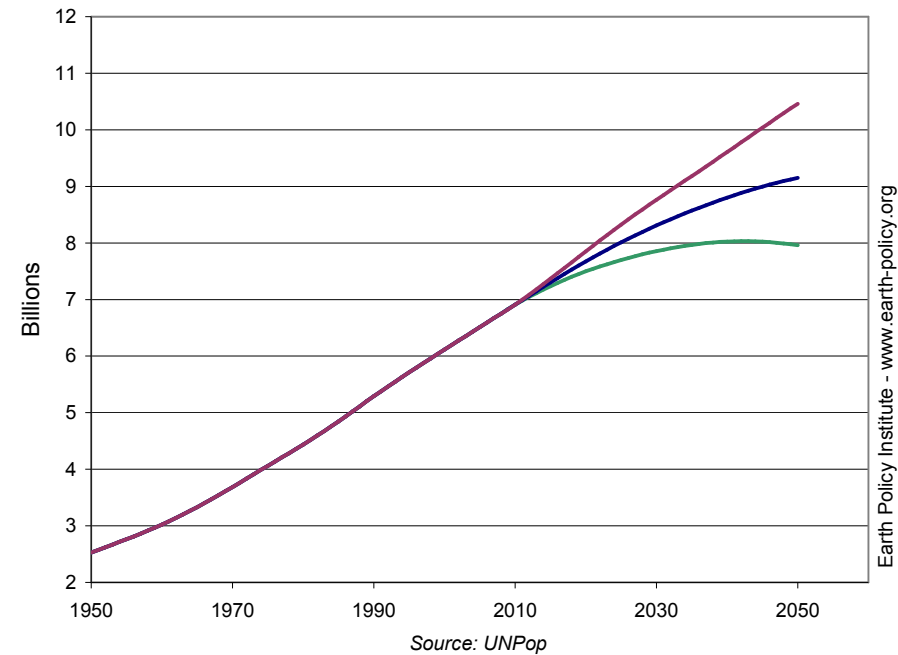
- ④ **Conflict**
 - Differing values, actions or directions
- ④ **Environmental conflicts**
 - Disagreement over alternative uses of available resources
- ④ **Lack of balance** between economic development and environmental protection.



Population Pressures

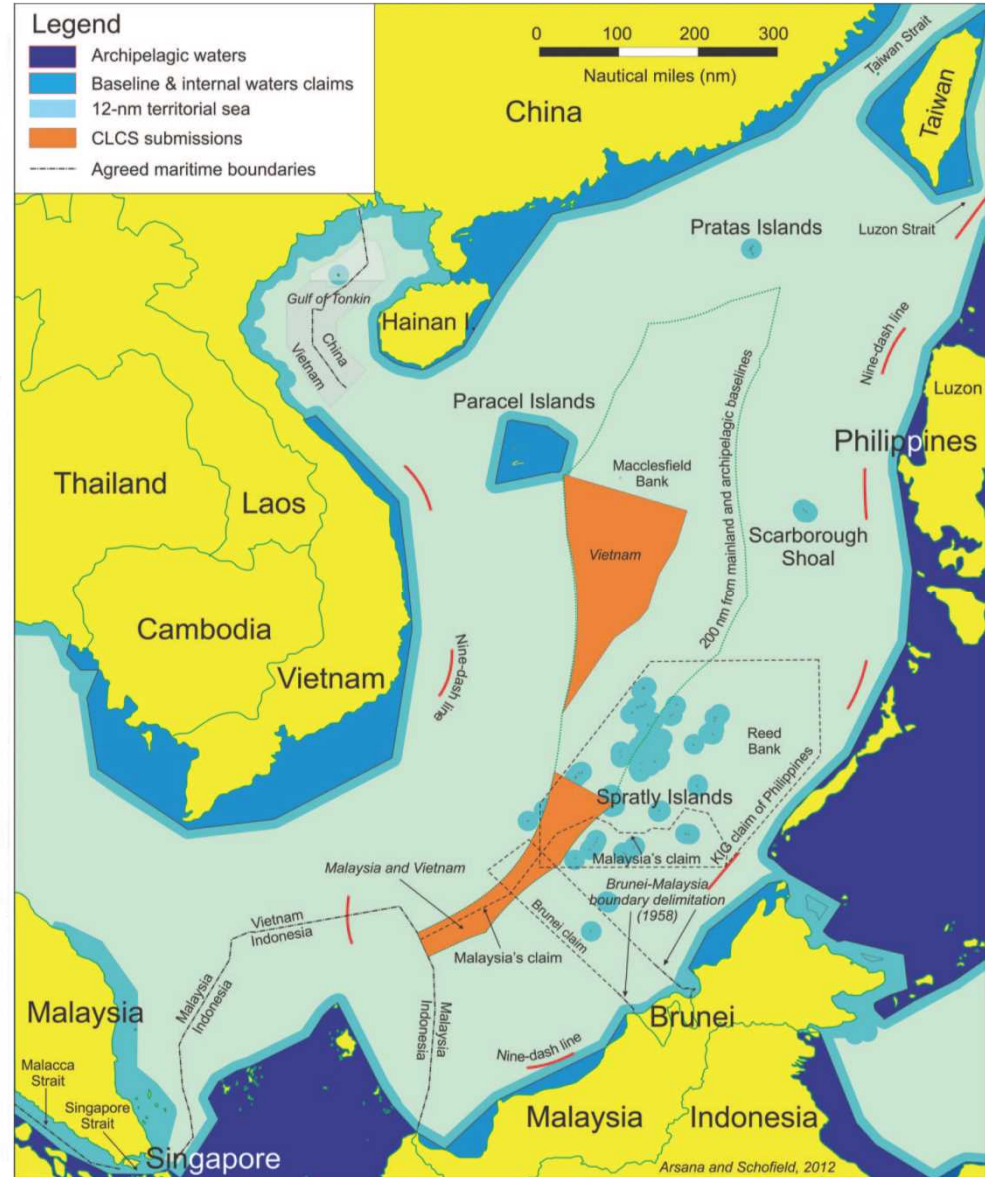
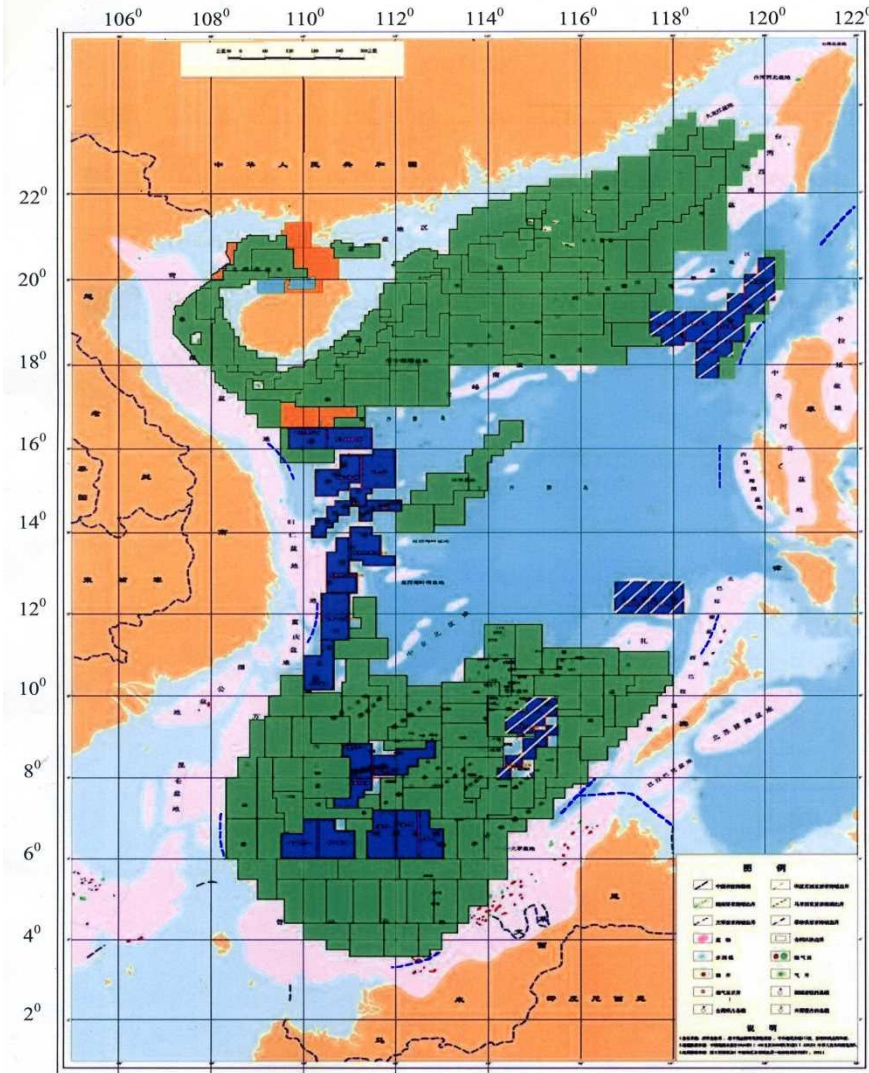
- ⊙ Dense populations and degrading land undermining food production
- ⊙ Large families trap people in poverty
- ⊙ Insufficient lively supplies

World Population, 1950-2008,
with Projections to 2050





Seabed energy exploitation





IV. Environmental Challenges in the SCS

- ④ Cooperative arrangements are not fully and effectively implemented
- ④ UNEP Regional Seas Program
 - established in 1974 with more than 143 countries in 13 Regional Seas programmes
- ④ UNEP programme promotes compliance with existing environmental treaties and is based on member country goodwill.





Successful Regional Seas Programmes

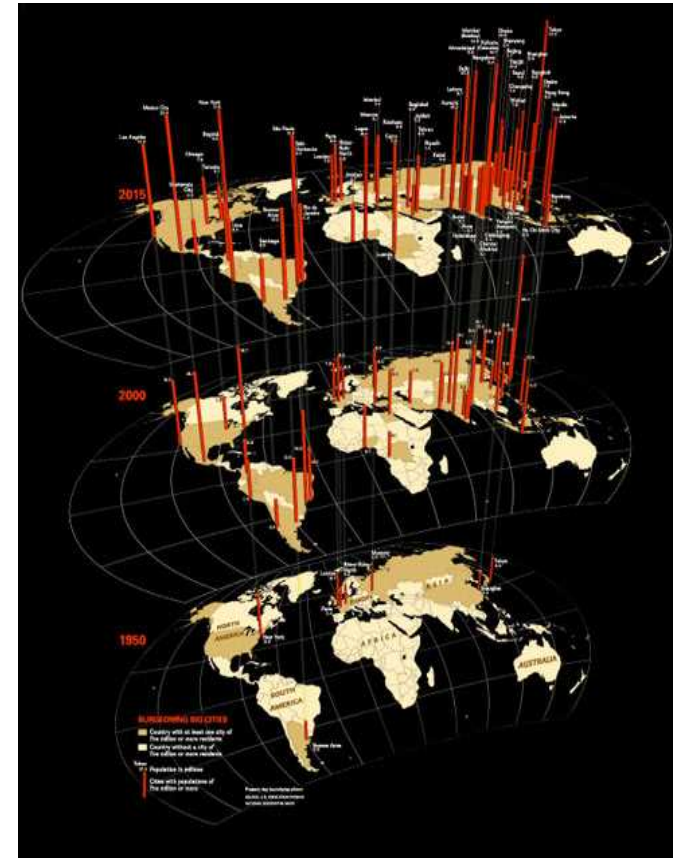
- Mediterranean Action Plan for the Barcelona Convention
- Red Sea/ Gulf of Aden
- OSPAR – North-East Atlantic
- South Pacific Regional Environmental Programme (SPREP)





•IV. Emerging Challenges in the SCS

- UNEP Regional Seas Program
 - East Asian Seas (COBSEA)
 - Southeast Asian Seas
 - North-West Pacific (NOWPAP)
 - North-East Pacific – unratified convention
 - COBSEA Coordinating Body on the Seas of East Asia
 - Ten member countries



<http://magma.nationalgeographic.com/ngm/0211/feature3/>



IV. Emerging Challenges in the SCS



COBSEA

- Not always successful because of lack of member countries' commitment and understanding of marine and coastal degradation by the wider community.
- Could easily combine with other agencies or have closer ties with them.



UNEP stopped assisting with funding in 2006:

- "that members should carry the financial burden if they wanted a viable organization."
- unless contributions increased, the COBSEA Trust Fund became completely depleted in 2011.



PEMSEA-Partnerships in Environmental Management for the Seas of East Asia

- ④ Created in 1993
- ④ Funding come from GEF
- ④ Given "legal personality" in 2009
- ④ Focuses on promoting integrated coastal management & capacity building
- ④ Promotes public-private partnerships
- ④ Conducted a series of projects gaining its great recognition
- ④ Functions and scope:
 - Rather limited and restricted by its role
 - Appears to have no programs related to climate change



COBSEA & PEMSEA

- ④ Seven COBSEA countries are in both organizations.
- ④ Each organization has several members that do not belong to the other.
- ④ Overlapping goals
- ④ Competition for funding & professional expertise

- ④ COBSEA
 - Its future: Merge with PEMSEA?
 - Membership is different in the two organizations
 - Unanimous agreement of all countries would be required



IV. Emerging Challenges in the SCS -- Climate Change

- A **very serious threat** to global stability **in many forms**:
- Temperature rise
 - sea level rise
 - massive biodiversity loss
 - increase of extreme events
 - Depletion of fresh water resources
 - Economic and social instabilities
 -





IV. Emerging Challenges in the SCS -- Climate Change

- Sea level is rising at a rate of about **2 mm** a year and is accelerating, up to 0.5 to 1 meter by the end of this century.
- Many coastal states may witness a change in existing coastlines or may be submerged due to the rising sea level.





Climate Change in the Yellow, East and South China Seas



Matthias Fischer
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Changes in air and sea surface temperatures over the Yellow Sea, East and South China Seas over the last decades are shown. Climate model results are used to make future projections for surface temperatures and precipitation rates. Furthermore changes in frequency and intensity of extreme events are presented.

I: Changes over the last decades

The surface air temperature (SAT) taken from the NCEP dataset and the sea surface temperature (SST) of the high resolution (0.1°) climate model STORM show similar warming patterns over the Yellow Sea (YS), the East China Sea (ECS) and the South China Sea (SCS).

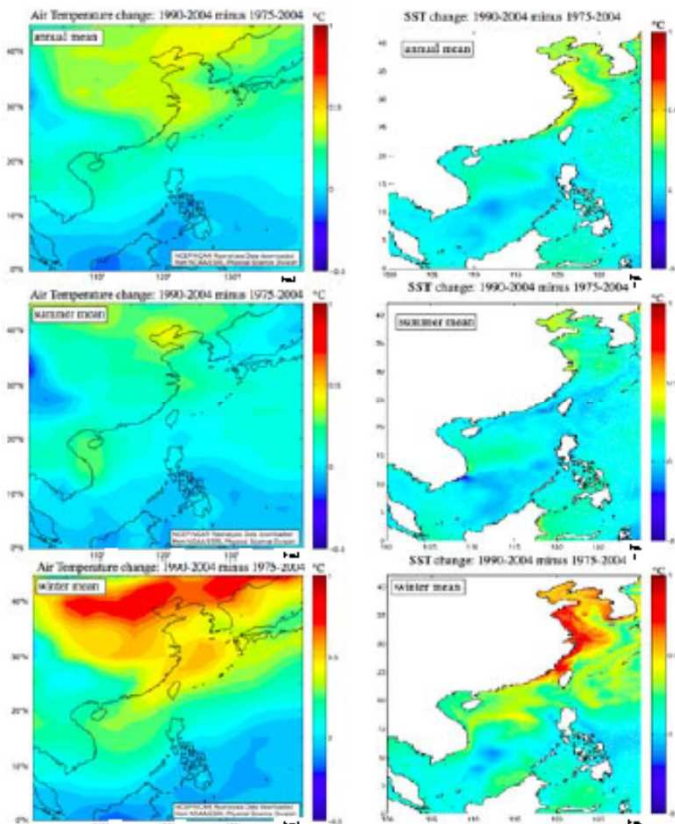


Fig.1: Change of SAT (left) and SST (right); annually (top), summer (middle) and winter (bottom)

II: Future Projections

The ECHAM5-MPI-OM climate model with a spatial resolution of 1.875° (~200km) in the atmosphere and including aerosols is used to analyze changes in the SAT and precipitation over the YS, ECS and SCS. The model run is based on the A1B scenario.

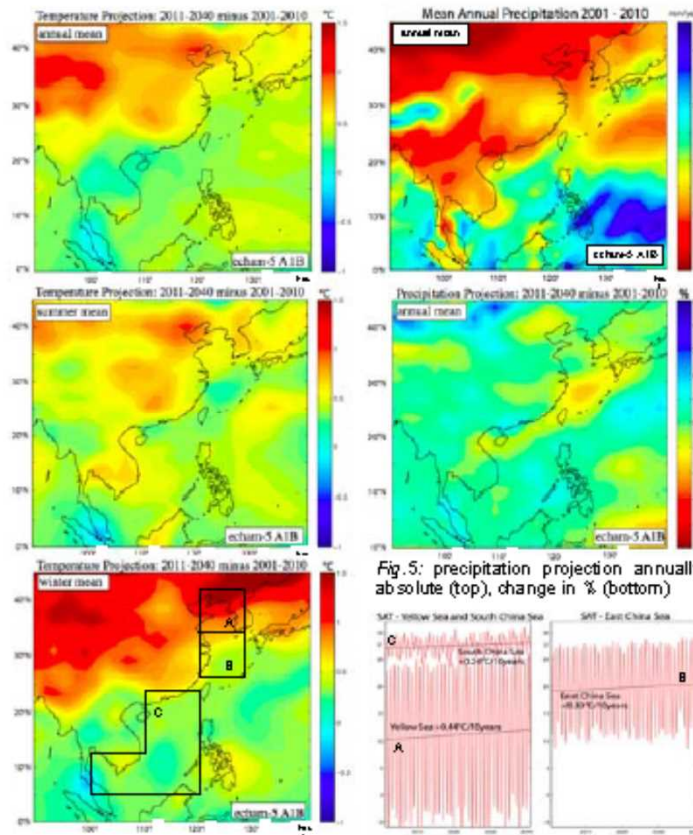


Fig.4: SAT projection; annually (top), summer (middle) and winter (bottom)

Fig.5: precipitation projection annually; absolute (top), change in % (bottom)

Fig.6: mean SAT 2001-2040 for YS (A), ECS (B) and SCS (C);



V. Implications for the South China Sea States

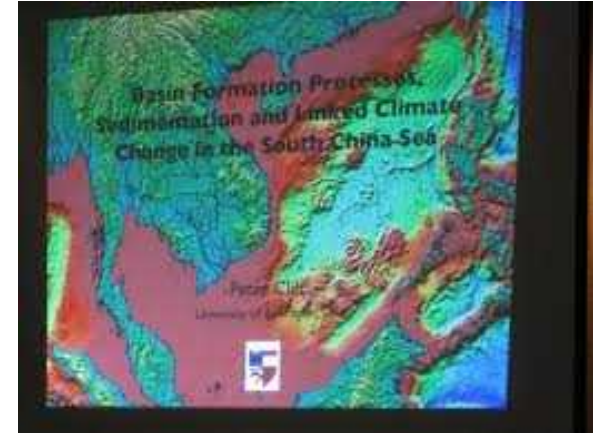
- Who will be the Climate Change's First Refugees?
- Will SCS States be Blessed and escaped from the disasterous global warming induced effects, such as Sea Level Rise?





V. Implications for the South China Sea States

- 70% of the coral damage comes from human activities, yet, **30% from warming of sea waters.**
- Sunanda Creagh, "**Coral Triangle at risk from climate change**", JAKARTA, Wed May 13, 2009
- Ocean observation stations along the SCS contested water for decades: **the water temperature has been increasing and so have the water levels.**





V. Implications for the South China Sea States

- Hong Kong government has been tracking the mean sea level in Victoria Harbor since 1954, found that sea level has risen 2.8 mm per year.
- This findings also coincide with IPCC sea-level rise predictions.
- Journal of Tropical Oceanography (热带海洋学报);
- Journal of Ocean University of China (中国海洋大学学报)



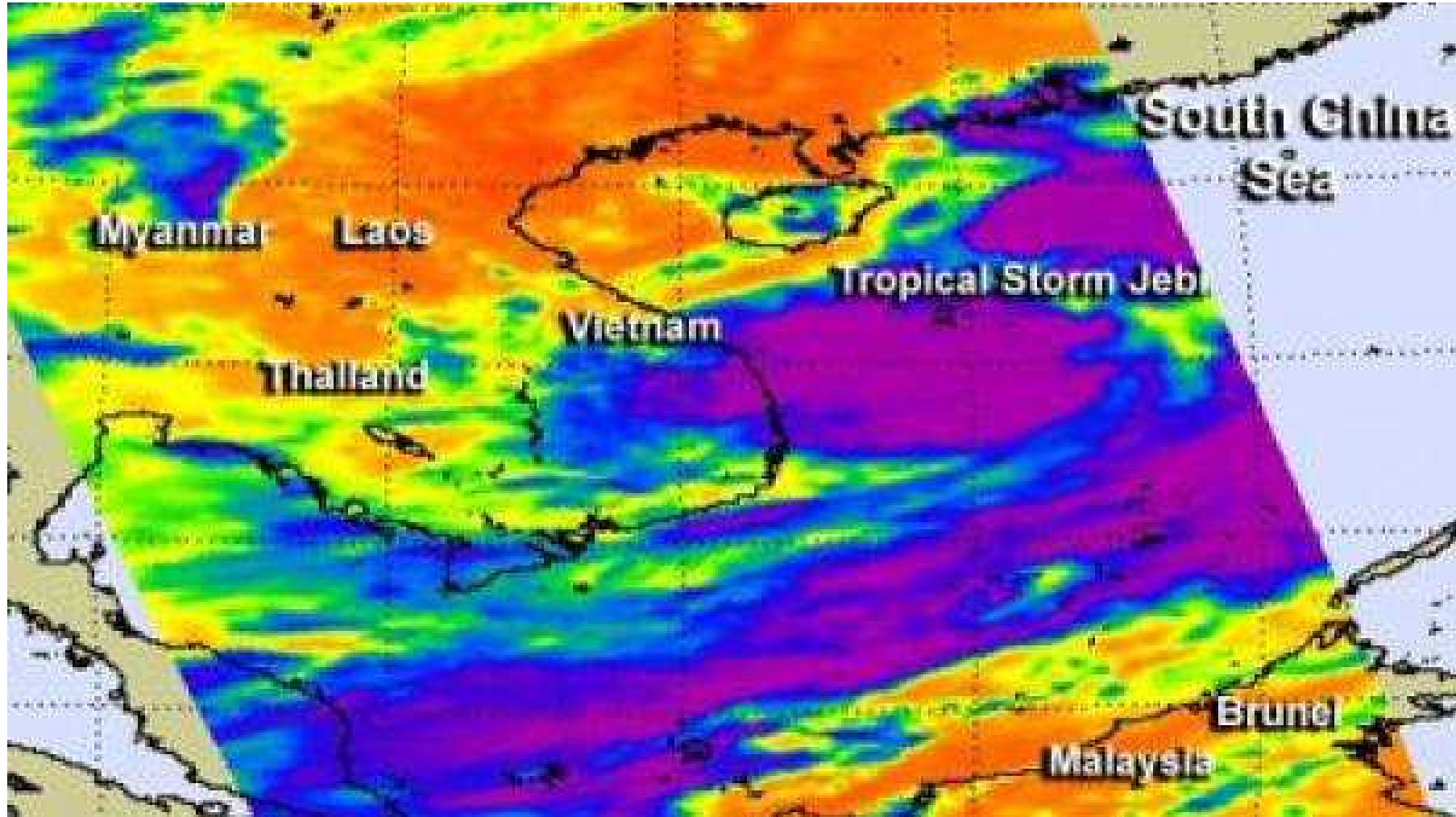


V. Implications for the South China Sea States





V. Implications for the South China Sea States





VI. Concluding Remarks and the Way forward

- ④ Given the serious threat to marine environment presenting the globe and regional oceans, the issue of how to bring the coastal states of the semi-enclosed SCS move into the environmental field towards sustainable development.
- ④ Given good experiences are available with beneficial references, how to develop good experiences and the strength of other regions, including as a policy forum, to come to a joint action of the SCS.
 - a moderate approach might be more feasible in SCS, but changed mindsets - common interests rather than self-interest may be more important.



VI. Concluding Remarks and the Way forward

- ④ The significance of the SCS and its marine environment to coastal states cannot be overemphasized, so it is the duty to establish a cooperative framework on pollution control and environmental protection.
- ④ The SCS is not in lack of legal basis on duty to cooperate, yet, the coastal states has not been strictly performed their duty to conduct substantive cooperation over the past decades.
- ④ Regardless of the outcome of the anticipating Code of Conduct in SCS, the duty to cooperate should be put on agenda in low-sensitivity political fields.
- ④ It is desirable to establish technical committees under the framework of the implementation of the DOC and to promote the cooperation thereof in an effective manner.

Thank you for your attention!



MISTAKES

IT COULD BE THAT THE PURPOSE OF YOUR LIFE IS
ONLY TO SERVE AS A WARNING TO OTHERS.