18 South China Sea

Overview

The South China Sea is a critical world trade route and a potential source of hydrocarbons, particularly natural gas, with competing claims of ownership over the sea and its resources. Stretching from Singapore and the Strait of Malacca in the southwest to the Strait of Taiwan in the northeast, the South China Sea is one of the most important trade routes in the world. The sea is rich in resources and holds significant strategic and political importance.[1]

Location

Basic information[9]

Surface area : 2,319,000 ㎢
Volume : 3,830,988 ㎢
Average depth : 1,652 m
Maximum depth : 5,016 m

Nature

< Background >

The area includes several hundred small islands, rocks and reefs, with the majority located in the Paracel and Spratly Island chains. Many of these islands are partially submerged land masses unsuitable for habitation and are little more than shipping hazards. For example, the total land area of the Spratly Islands encompasses less than 7.8 ㎢.[1]

There are approximately 125 major rivers in the South China Sea region, draining 2.5 million ㎢, and numerous smaller rivers and streams flowing from the mountainous interior of parts of the region.[2]

Climate

Most of the region lies within the tropical and equatorial zones (from near the Equator to about 22°N). In much of the region there are two seasons, the dry season and the wet season, as the climate is governed by the regime of the northeast and southwest monsoons. The temperature usually ranges from 21 ℃ to 33 ℃, but at higher altitudes the climates is cooler. The average temperature throughout the year in many areas is very stable (26 ℃).[2]

Topography

The bottom topography of the sea is characterized by two extended continental shelves on the northern and southern sides and a deep basin, with a maximum depth of 5,016 m, situated in the central-eastern region. The deep basin occupies 44% of the total area of the South China Sea.[3,9]

Geologically, the Indian subcontinent collided with the Eurasian plate in the Late Eocene and led to the rifting of the Sunda Shelf, including Borneo, the Malaysian Peninsula the and Palawan micro plate. The rift is hypothesized to be the origin of the northwest sub-basin of the South China Sea. North to south spreading occurred 27 to 16 million years ago, causing the formation of the eastern sub-basin of this marginal sea. The southwest sub-basin was formed 20 million years ago, and spreading ceased around 15.5 million years ago.[4]

Hydrology

The hydrology of the region is dominated by the typical monsoon climate, which includes large inter-seasonal variations of river flows. Major oceanographic currents include those generated by the seasonal monsoons: west flowing current around West Kalimantan: North flowing current between West Kalimantan and the Malaysia Peninsula bifurcating into the Gulf of Thailand the South China Sea and flowing north to the east of Vietnam with a gyre developed to the east of central Vietnam, and northeast from east of Hainan towards Taiwan: upwelling areas of northwestern Philippines and off Vietnam.[2]

< Surrounding environment >

Biota

The Indo-West Pacific marine biogeographic province has long been recognized as the global center of marine tropical biodiversity. Forty-five mangrove species out of a global total of 51: 50 of 70 coral genera: 20 of 50 seagrasses species: and 7 of 9 giant clam species, are found in the nearshore areas of the South China Sea. Compared to the Atlantic, the tropical

Indo-West Pacific is highly diverse. Only 5 mangrove species and some 35 coral species are found in the Atlantic compared with 45 mangrove and over 450 coral species recorded from the Philippines.[4]

History and Culture

< History >

The South China Sea has been an important maritime region for trade and interaction among different peoples ever since, while displaying a frequent shift of the leading maritime power to different peoples and to different ports or states in different time period and also showing an increasing sphere of influence to a greater part of the world.[5]

Social Environment

< Population >

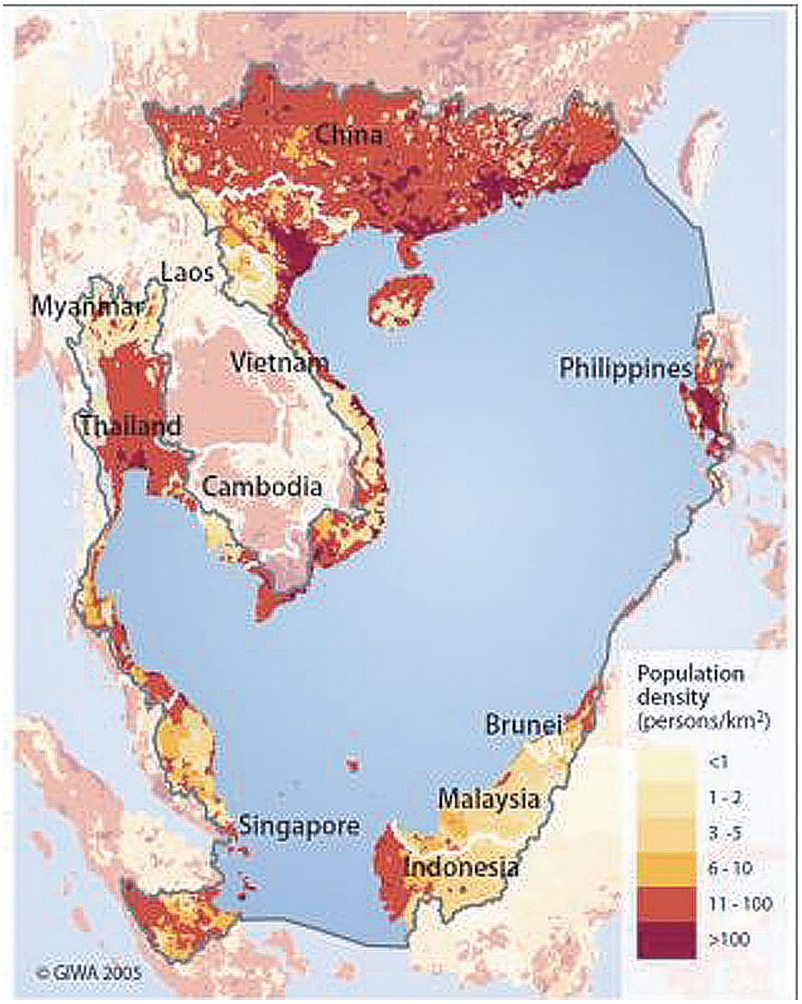
The region's human population is represented by a diverse mix of ethnic groups of nine nations, some forming ancestral tribal groups, others of more recent arrival. The total population of the region is estimated at 350 million persons.[2]

< Land Use >

When mangrove forests are destroyed and replaced by alternative forms of land use, not only are the species of plants and animals lost but also many ecosystem services provided by mangrove systems are lost as well. This is well known in Viet Nam where the function of coastal vegetation, particularly mangroves is considered a vital service with measurable economic benefits as a protection against hurricane damage and marine based flooding. Mangrove degradation causes losses in direct and indirect economic values that support socio-economic development at both local and national scales.[6]

< Industry >

The surrounding seven countries are at various stages of industrialization. Cambodia, with a national GDP of 0.12 million USD earns 45% of this from agriculture, and 20% from industry. In contrast, Indonesia relies on the industry sector for 57% of its GDP. In terms of increasing reliance on industry for the generation of GDP, the countries may be ranked in the following order: Indonesia, China, Thailand, Philippines, Cambodia.[4]



Population density around the South China Sea[2]

Fisheries

Fisheries in the South China Sea are of great local, national and international importance, being a major contributor to both food and income. In total, the South China Sea produces around 5 million tons of catch each year, amounting to about 10% of the total global catch. Five of the littoral nations are among the top eight shrimp producers globally, mostly through aquaculture with large-scale consequences to habitats and water quality.[2]

Shipping

Shipping, navigation and transportation all depend on stable international relations, and states with a will and capacity to repress piracy. As the littoral states of the South China Sea are dependent on the sea to export and import goods, and for fishing, tourism, and other uses, there is a critical need for regional cooperation on these issues. Concerns in Malaysia, Singapore and Indonesia for the environmental security in the highly congested Malacca Strait need to be addressed. As one of the world's key thoroughfares for shipping, it is important for both the regional and outside powers to uphold peace, safety and stability, so as not to disturb the economies dependent on the sea lanes passing through.[2]

Environmental Problems

< Water and sediment quality >

Water quality

About 6 million tons of BOD (Biochemical oxygen demand) are generated each year by the coastal population of the 7 countries of the South China Sea alone. Of these, only 11% is removed by sewage treatment in four countries. Assuming the same population growth rates prevail up to 2005, the generated BOD will increase to 6.6 million tons. If the amount removed by sewage treatment is not significantly increased from the insignificant level of 11%, the coastal waters of the Sunda Shelf from the Indo-China Peninsula to Malaysia and Indonesia, across to the western Philippine shelf, will become eutrophic.[4]

< Other Environmental Problems >

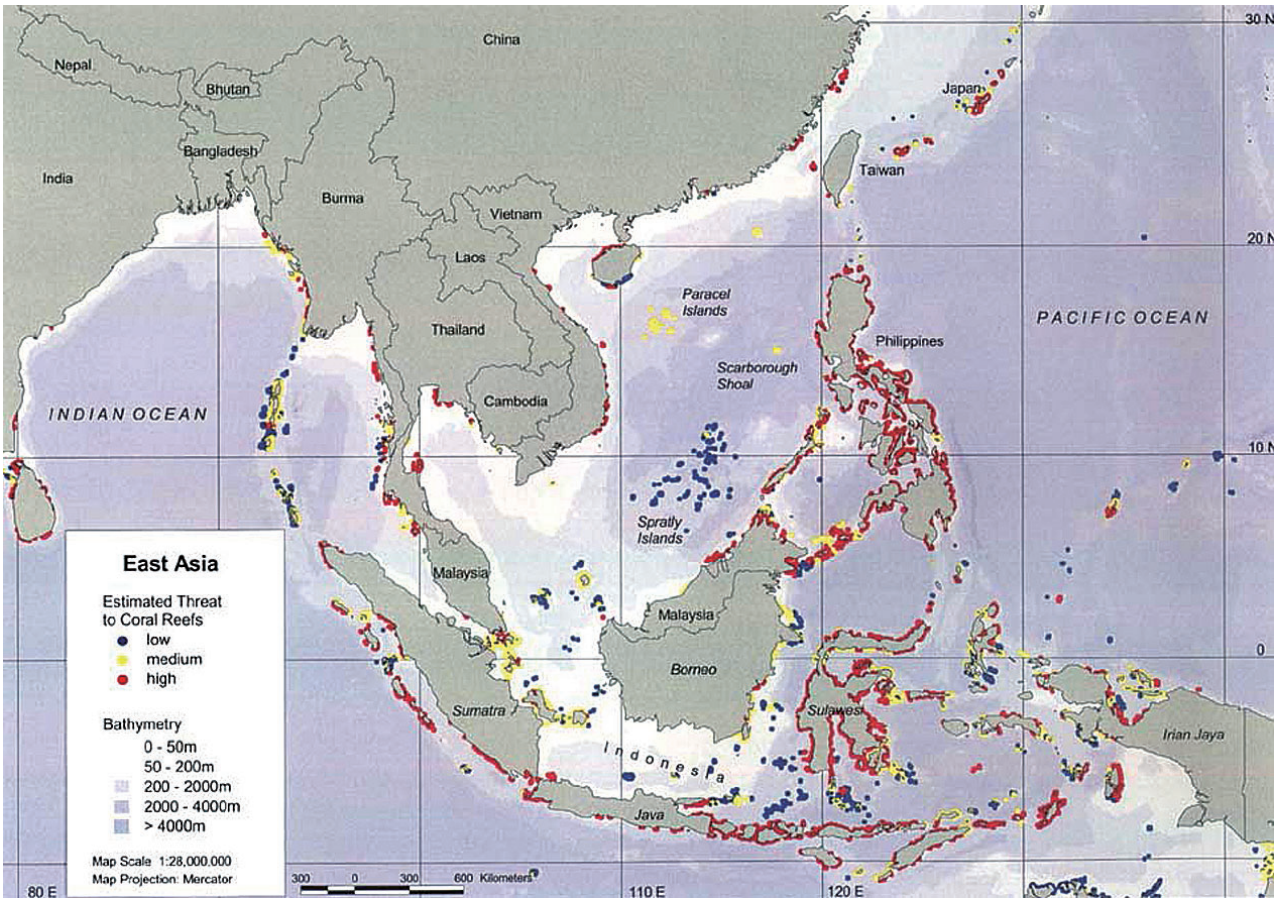
Trans Boundary Issues associated with Regional Food Security

Currently, South China Sea countries are net exporters of seafood and will most likely remain so, assuming that there is no drastic reduction in fish production. Regionally, the coastal population alone will reach 540 million by 2035 using current growth rates.[2] To secure the minimum nutritional requirement, about 86% of current production must be allocated for domestic consumption. This implies that the region can export 14% at most.

If export levels are to increase beyond 14%, either domestic consumption will fall below the minimum requirement, total fish production will have to increase, or population growth rates will have to decline. The options may be difficult to optimize toward one goal or the other, but a compromise towards long-term benefits for society, the ecology, and the economy will have to be formed soon.[4]

Threats to coral reefs

A working group which consists of 6 coastal countries of the South China Sea under a UNEP project identified the key regional threats to coral reefs in the South China Sea during its sixth meeting from 22nd to 25th August 2005. These threats include over-fishing, destructive fishing, pollution (mainly eutrophication), and sedimentation. Indirect causes of these threats are high demand for food, coastal development, deforestation and unsustainable tourism. Coral bleaching is considered a serious natural threat to coral reefs in the region.[7]



Vulnerability of Coral Reefs in the South China Sea[8]

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