


CORAL REEFS OF SAUDI ARABIA





Coral reefs contribute directly or indirectly to the economies of the countries to which they belong. While 12 percent of world's fish production depends on coral, their formation also serves as a major tourist attraction. The reef also plays a major role in protecting coastlines because they serve as a natural shield against strong waves swallowing the beaches

WHY ARE CORAL REEFS SO IMPORTANT?

- * Coral reefs are some of the oldest and most diverse ecosystems on the planet.
- * Living museums and reflect thousands of years of history.
- * Breeding & feeding ground for several marine organisms including fishes.
- * Provide resources and services worth many billions of dollars each year to human societies.
- * Buffers shorelines against waves, storms, and floods, helping to prevent loss of life, property damage, and erosion.
- * Coral reef plants and animals are important sources of new medicines - “medicine cabinets” of the 21st century.

Coral reefs is an inhabited and dynamic world, and the relationships among its creatures are complex. Indeed, the coral reef is the sea world's most complicated biotope, a word meaning a region with uniform environmental conditions for the plants and animals that live there.

A coral reef is very high in the number of different species it includes. And its inhabitants exhibit a tremendous variety of diverging adaptations and fine specializations that suits each of them neatly for its particular role in the coral reef ecology.



The coral reefs of the Saudi Arabia have cultural, economic and scientific value.

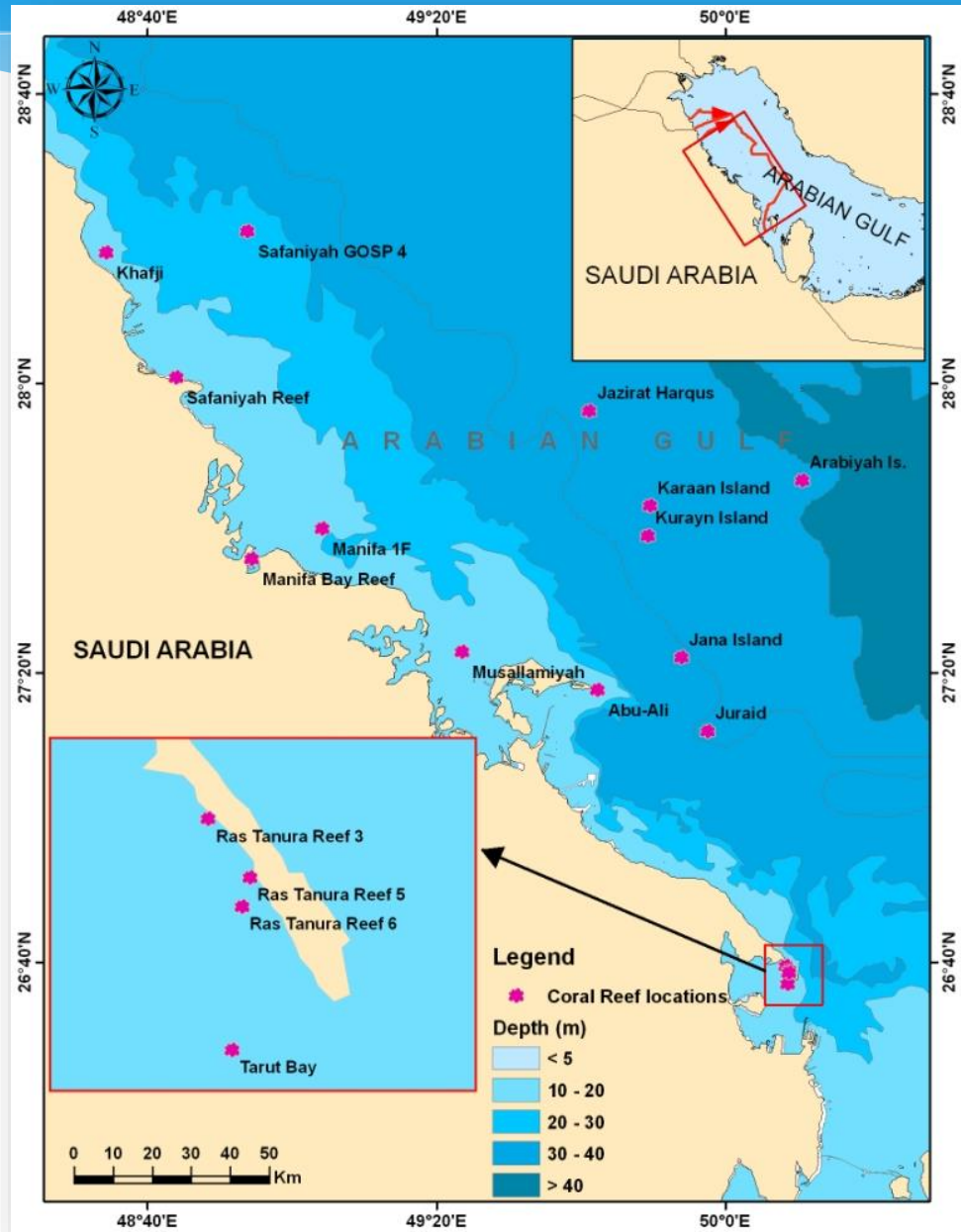
Coral Reefs of Saudi Arabia

A. Gulf Coral Reef

B. Red Sea Coral Reef

A. CORAL REEF DISTRIBUTION ALONG GULF COAST

- Arabian Gulf coral communities exist in a harsh environment with respect to salinities and extreme low tide .
- A variety of natural and anthropogenic disturbances threaten the survival of coral reefs along the Gulf coast.



❑ Coral reefs occur in all the world's warm oceans where conditions are right - in particular where water salinity is not too high and water temperature does not vary too widely during the year - and the reefs of the Red Sea are famous for their variety and color.

❑ Yet large and healthy coral reefs and coral islands are also common in the salty, shallow Gulf, where conditions are far from ideal for their growth.

❑ Thanks to the Gulf's adversely high salinities and adversely large swings in water temperature , coral reefs there are less populated than elsewhere in the world in the numbers of species of coral and associated creatures they support - and they are thus easier to study.

❑ Where a Pacific Ocean reef may support as many as 3,000 different species, a typical Gulf coral reef is home to between a third and half as many.

NATURAL CONSTRAINTS TO CORAL REEF DEVELOPMENT – ARABIAN GULF

- Extreme temperature range & anomalies (10-15 yrs).
- Extreme salinity range.
- Extensive areas of unconsolidated carbonate sediments.
- Scouring action by mobile sediments on limestone substrates.
- Competition with macro-algae.

REEFS ASSOCIATED WITH OFFSHORE ISLANDS



Rich coral reefs thrive around Karan, Jana, Jurayd, Al Arabiyah and Kurayn Islands

SPECIES DIVERSITY

Family



Acropora valida

Acroporidae (11)



Porites lobata

Poritidae (6)



Pseudosiderastrea tayami

Siderastreaeidae (8)



Favites pentagona

Faviidae (21)



Turbinaria pelata

Family

Dendrophyllidae(4)



Stylophora pistillata

Pocilloporidae(1)



Acanthastrea echinata

Mussidae (1)

Total = 52 species

(Arabian Gulf waters)

SOME OF THE REEF ASSOCIATED FISHES



Lutjanus sp.



Abudefduf vaigiensis



Chaetodon melapterus



Chaetodon nigropunctatus



Pomacanthus maculosus



Amphiprion clarkii

THREATS & MANAGEMENT ISSUES

NATURAL :

- * **Coral Bleaching:** Coral mortality (up to 98%) following bleaching events associated with increases in the frequency and prolongation of positive seawater temperature anomalies.
- * **Diseases:** Yellow-band, Black-band and white band diseases present and prevalence maybe increased by anthropogenic stressors.
- * **Crown of Thorns:** Periodically abundant on East Coast reefs where they have caused extensive damage. A kind of starfish.

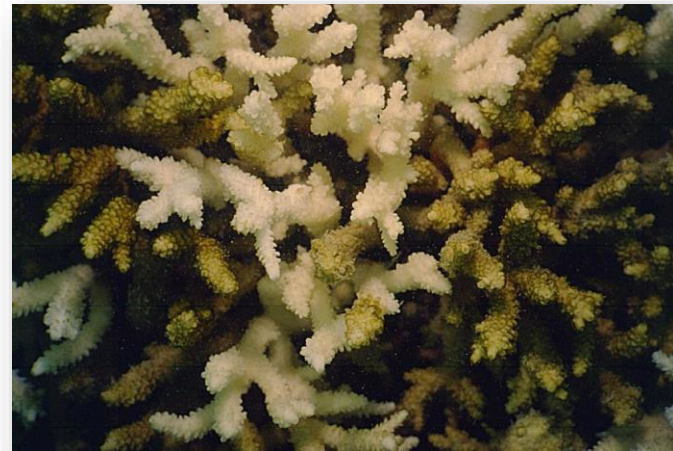
ANTHROPOGENIC:

- * Dredging & landfilling
- * Coastal Pollution
- * Fishing Impacts

NATURAL STRESSES- ALONG GULF COAST

- **Coral bleaching events of 1996: In the summer, near shore SST was 33.5° - 37°C for no less than 90 days.**
- **Black Band Disease (BBD) for *Acropora clathrata* coral was documented at Abu Ali reef during Aug-Sep1996.**
- **Another bleaching event recorded in 1998, which was detrimental to reefs barely recovering from the 1996 bleaching.**

BLEACHED CORALS



B. RED SEA CORAL REEFS

The Red Sea coral reefs are among the most beautiful of all the world's marine habitats. This vast inlet of the Indian Ocean provides ideal conditions for corals and other countless forms of aquatic life. There are about 200 species of “stony corals” along the coast.

Most corals are reef builders. Each of these sea polyps builds a skeleton and the animal sits in a calcareous cup that it has secreted. The polyps are connected to each other by an extension of the body above the level of the skeleton. Thus the colony sits on the surface of the skeleton, feeding on algae and particles of food drifting along in the water.

- ❑ Red Sea coral reefs are the northernmost in the Indian Ocean. Most of the Red Sea coast is rimmed by shallow submarine shelves and extensive fringing reef systems, by far the dominant reef type found here.
- ❑ Red Sea fringing reef platforms are over 5000 years old, and the entire coastal reef complex extends along some 2,000 km of shoreline.
- ❑ Most such reefs grow directly from the shoreline. The dominant, most actively growing corals include most notably highly branched species of the genera **Acropora** and **Porites**.

Thus, Red Sea reefs have developed a number of features that distinguish them from reefs found throughout most of the rest of this vast oceanic area.

- ❑ Particularly important in the light of global warming predictions is the fact that Red Sea corals have developed an unusually high tolerance to the **extreme temperatures, salinity, and occasional turbidity (caused by huge seasonal dust storms)** that occur in the region. Such conditions that would be lethal or highly damaging to most hard corals found elsewhere.

- ❑ Also, water clarity is exceptional in the Red Sea because of the lack of river discharge and low rainfall.
- ❑ Thus, Red Sea reefs are not heavily impacted by the suspension and dissipation of fine sediments that plague reefs in tropical oceans near large land masses.



Endemic Red Sea reef fish
(*Chaetodon semilarvatus*).

- ❑ In general, the marine biota of Red Sea coral reefs is characterized by high endemism. For example, of the 1200 or so coral reef fish species recorded, about 10% are endemic (found nowhere else).
- ❑ About 300 hard coral species have been recorded from the Red Sea as a whole. The Egyptian coast alone supports about 200 species of reef building corals belonging to almost 50 genera.
- ❑ The Red Sea, home to 662 varieties of coral, has the largest variety of coral in the north of the Indian Ocean.

STATUS OF RED SEA REEFS

- ❑ Despite the extreme conditions characteristic of the region, Red Sea coral reefs are generally healthy.
- ❑ Coral reefs range widely in condition and cover, with up to 85% living coral cover at the best sites and over 50% live coral cover at many other locations.
- ❑ There is usually minimal coral bleaching evident, although some localized outbreaks are reported from time to time.

- ❑ Pollution in the Red Sea has reached epic proportions. Coral reefs spanning thousands of kilometers along the coastline in the region are under threat of extinction.
- ❑ “The entire expanse of sea lying between Jeddah and Qunfudha is polluted and has resulted in the depletion of the fish resources and the total disappearance of tuna fish. Reckless fishing damages the fish-breeding environment,” says Abdullah Al-Sayed, a prominent fisherman in Jeddah.
- ❑ He added that sewage-pumping is another major factor that has led to the destruction of habitats of fish and other sea organisms.



In a related development, **Saudi Aramco and the King Fahd University for Petroleum and Minerals** are conducting a joint study on the impact of oil tankers and other ships on marine life in the Gulf. Aramco is also collaborating with the Ministry of Agriculture to draw up a strategy for the protection of locations where fish live in large numbers in the Red Sea and the Arabian Gulf.