Brief Description:

The Red Sea Large Marine Ecosystem is a semi-enclosed tropical body of water situated between the Mediterranean Sea and the Indian Ocean (see Getahun, 1998). It is an elongated basin extending from Suez to the strait of Bab-el-Mandeb. In the North, the Red Sea LME ends with the Gulf of Aqaba and the Gulf of Suez. Its width varies from 30 kilometers to 280 kilometers. It is an environmentally unique area, with warm clear waters and a complex reef ecosystem that protects the coast from storm activity and provides habitats for a wide range of marine species. The Red Sea is separated from the Gulf of Aden to the South by a sill (see Getahun, 1998). Its geological formation is relatively new. It was formed as the result of an expansion of the Mediterranean Sea. The LME has varying hydrographic conditions, in terms of circulation, temperature and salinity. For information on coral reefs of the Red Sea Large Marine Ecosystem, see www.unep.ch/coral.html.

I. Productivity:

The Red Sea LME is considered a Class II, moderately productive (150-300 gC/m²-yr), ecosystem based on SeaWiFS global primary productivity estimates. Its circulation patterns (clockwise in the summer, counterclockwise in the winter), its relative isolation, its higher water temperatures and salinity in the summer create a favorable environment for endemic species. A 3-layered current structure exists where the Red Sea LME comes into contact with the Arabian Sea LME at the Strait of Bab-el-Mandeb. In the winter there is a surface inflow of waters from the Gulf of Aden, and a bottom outflow of Red Sea water. This flow is reversed in the summer. Temperature and salinity increases during the summer are as high as 30 degrees Celsius and 41 parts per thousand. For information on nutrient supply in the winter and summer, see Beckmann (1984). Dissolved oxygen decreases in the winter. The phytoplankton and zooplankton distribution is associated with seasonal changes in water and nutrient flow (see Getahun, 1998). The predominant phytoplankton species (see Baars et al., 1998) are the dinoflagellates Pyrocystis pseudonoctiluca, Ceratium carriense, C. trichoceras, and C. massiliense. Zooplankton distribution is more complex. The biomass of mesopelagic fish is greater in spring than in winter, when diatom blooms occur (see Halim, 1984) and the zooplankton stock is large. There is a high biomass of small crustaceans during the spring. Generally, there is a decrease of productivity from South to North (see Getahun, 1998).

II. Fish and Fisheries:

The Red Sea LME’s marine resources include fish, invertebrates, marine mammals, turtles and seabirds. Two commercial species are shark and lobster. The initial influx of Ichthyofauna was from the Mediterranean Sea, but harsh conditions during the Pleistocene Era when the Red Sea was landlocked are believed to have caused the demise of all resident species. Today’s connection of the Red Sea to the Indian Ocean was re-
established at the end of the glacial period. Common Red Sea species are *Raja fullonica*, *Sciaena aquila*, and *Syngnathus algeriensis*. Endemic species include *Sphyrna mokarran*, *Torpedo panthera*, and *Terapon jarbua* (see Botros, 1971).

There is a need for a workable and sustainable strategy to manage the living marine resources (fish and invertebrates) of this LME. At present there is no regional fisheries body that can coordinate for the entire region. There is also a paucity of reliable data and, until recently there was no standardized method for the collection of new data. Unregulated fishing is a threat. One positive move is the replacement of gillnets with lobster traps, which will enable fishermen to release female lobsters with eggs.

The University of British Columbia has [detailed fish catch statistics](#) for this LME. A graph of the FAO data is provided below.

**III. Pollution and Ecosystem Health:**

The key environmental threats identified in this LME are uncontrolled development, oil pollution and unregulated fishing. The LME is highly traveled as tankers make their way through the Suez Canal. It is a high-risk area in terms of navigation. There is a need to establish official traffic lanes and separation schemes for the heavy flow of ships through the Red Sea. A step in that direction has been accomplished in that surveys have been completed and hazardous rocks have been located. There is a [Strategic Action Plan](#) (SAP) for the Red Sea and Gulf of Aden project funded by the World Bank that aims to improve coastal and marine environments by reducing navigation risks, and preventing and
controlling maritime pollution.  
There is a need to establish more marine protected areas.

IV. Socio-Economic conditions:

For centuries, local fisheries have provided food and employment to the people of the Red Sea. The LME is attractive to tourists. Every year, hundreds of thousands of tourists come to the area for marine recreation, diving and snorkeling. Revenue from tourism is a vital, valuable earner of foreign exchange.

V. Governance:

The countries bordering the Red Sea are Egypt, Sudan, Eritrea, Djibuti, Yemen, Saudi Arabia and Jordan. In the 1970s, the Arab League Educational, Cultural and Scientific Organization (ALECSO) developed the original impetus to bring all these countries together to address shared marine environmental issues. The outcome was the Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment, or Jeddah Convention, which provides the legal framework for cooperation in marine issues. It was signed in 1982. A Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) has been established. Since then, a Strategic Action Plan for the Red Sea and Gulf of Aden has been put into motion. The aim of this project, funded by the World Bank, is to improve coastal and marine environments by supporting integrated coastal zone management and identifying institutional and legal impediments to the ratification of maritime conventions. The Global Environment Facility (GEF) is involved in this major new environmental initiative, and information is available on GEF-supported projects in the Red Sea. The countries bordering the Red Sea are beginning to create marine protected areas. These sites will provide sanctuaries for valuable species at particular stages of their life history. There are protected areas in Egypt, Sudan, Saudi Arabia and Yemen. Many in the general public are not yet fully aware of the value of their marine environment, and there is a need to raise public awareness through education.

References cited:


Reference source:
27 September 2002