the neighboring nations of Egypt, Djibouti, Jordan, Eritrea, Palestine, Saudi Arabia, Somalia, Sudan, and Yemen. It was complemented by relevant provisions of various internationally recognized Law of the Seas bodies and covenants.

The Jeddah Convention and its associated protocols through 2006 include a range of features aimed at preventing and mitigating such threats as oil spill pollution, and other features that promote conservation of biological diversity. This latter goal is supported by the ongoing development of protected areas in the Red Sea and Gulf of Aden. An overall Strategic Action Plan was implemented in 1999 as a coordinated effort by PERSGA, UNEP, and related regional and global bodies. This plan strives to strengthen administrative structures and regional cooperation; to reduce navigation risks and maritime pollution; and to support sustainable use of living marine resources, habitat and biodiversity conservation, development of a network of marine protected areas, and management of an integrated coastal zone.

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Adriatic Sea

Category: Coastal Seas Biome.
Geographic Location: Northeastern arm of the Mediterranean Sea.
Summary: A historically important sea, the Adriatic, with its complex biodiversity,

circulation, and geology, plays an important role in the greater Mediterranean Sea region.

An arm of the Mediterranean Sea, the Adriatic Sea separates the Italian peninsula from the Balkan peninsula. The Adriatic Sea is bordered by Italy to the west and north; and by Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, and Albania to the east. The Adriatic stretches some 500 miles (800 kilometers) from the Gulf of Venice—the northernmost extent of the Mediterranean—to the Strait of Otranto, a 45-mile (72-kilometer) channel separating Italy and Albania while connecting the Adriatic to the Ionian Sea area of the Mediterranean.

The Adriatic Sea is relatively narrow throughout, never spanning more than 120 miles (200 kilometers) east to west. Its surface area is about 53,500 square miles (138,600 square kilometers); the sea is fed by freshwater flows from a catchment area nearly twice that size, or 90,750 square miles (235,000 square kilometers). Indeed, the Adriatic supplies up to one-third of the freshwater flow received by the entire Mediterranean, mitigating the salinity of the greater body of water. From the shallows near the Venice lagoon and Bay of Trieste in the north, depths grow deeper moving southward, with a range from about 80 feet (25 meters) to 4,035 feet (1,240 meters).

The western Adriatic coast tends to be alluvial or terraced,while the eastern coast is highly indented with pronounced karstification, the geologic term for chemical and mechanical erosion by water on soluble bodies of rock such as the limestone found here. This type of erosion results in sinkholes, towers, caves, and a complex subsurface drainage system, and facilitates significant groundwater contributions to the Adriatic Sea. More than 1,000 islands dot the eastern coast. Dominant circulation in the Adriatic is clockwise.

It is estimated that the Adriatic's entire volume is exchanged into the Mediterranean Sea through the Strait of Otranto every three to four years, a very short period and likely due to the combined contribution of rivers and submarine groundwater discharge. The Po River flowing west to east across Italy's north,is the greatest single contributor of fresh water flows to the Adriatic, at 28 percent,

and the largest deposition of sediments as well. Submarine springs along the Balkan, or Dalmatian, coast together contribute another 29 percent of freshwater flows.

The climate of the Adriatic Sea is Mediterranean, with hot dry summers, and mild wet winters. The predominant winter winds are the *bora* and *scirocco*. The *bora* brings cold, dry continental air from the mountains east of the Adriatic Sea. The *scirocco* brings humid and warm air from northern Africa.

Biota

The Adriatic Sea contains more than 7,000 species including many unique, rare, and endangered ones. The diversity and degree of specialization found here is due in part to the Dalmatian coastal islands, karst complexes, and submarine water flows, including some geothermal springs. Several marine protected areas have been established along this coast to protect the karst structures and their habitats.

The Kornati Islands National Park, for example, was established by Croatia in 1980 to protect 89 islands (since expanded to 109) and their marine environs. Among the signature protected species in the Park is the noble pen shell (*Pinna nobilis*) a quite large, elongated clam. Kornati Park also hosts about half of the 682 known deepwater flora families of the Adriatic, such as red, brown, and green algae (*Rhodophyta, Phaeophyta,* and *Chlorophyta*). The park is home to an estimated 2,500 or more types of deepwater and tidewater species, including at least 177 species of mollusk; 127 species of bristle worms (*Polychaeta*); 64 species of sea stars, urchins, and cucumbers (*Echinodermata*); and 160 species of fish.

There are also more than 20 species of corals. Sponges are also found in relative diversity, although diminished from past human exploitation. Terrestrial species in the Park include Dubrovnik knapweed (*Centaurea ragusina*), an endemic (evolved specifically and uniquely to a biome) plant that forms a centerpiece of the coastal scrub vegetation here; olive trees are by far the leading cultivar. Representative fauna include seagulls, cormorants, and owls; their prey in the form of snails and lizards; and some 60 or more species of moth and butterfly (*Lepidoptera*).

The Adriatic Sea features numerous species rated from declining to critically endangered, with representatives across the spectrum: various rockweeds and seagrasses including *Cystoseira zosteroides, Cystoseira spinosa, Zostera noltii,* and *Posidonia oceanica*); bivalves such as *Gibbula nivosa* and the ribbed Mediterranean limpet (*Patella ferruginea*); the European eel (*Anguilla anguilla*); Adriatic sturgeon (*Acipenser sturio*); the beluga or great sturgeon (*Huso huso*); the great white shark (*Carcharodon carcharias*); sea turtles such as the loggerhead (*Caretta caretta*) and leatherback (*Dermochelys coriacea*); and marine mammals including various cetacean species and the Mediterranean monk seal (*Monachus monachus* or *Monachus albiventer*).

Avian species under stress range from raptors like the white-tailed sea eagle (*Haliaeetus albicilla*), greater spotted eagle, (*Aquila clanga*), and golden eagle (*Aquila chrysaetos*); to typical seabirds such as the great white pelican (*Pelecanus onocrotaius*), Dalmatian pelican (*Pelecanus crispus*), little tern (*Sterna albifrons*), and Balearic shearwater (*Puffinus mauretanicus*); and wetlands-oriented species including purple heron (*Ardea purpurea*), European flamingo (*Phoenicopterus ruber roseus*), common crane (*Grus grus*), glossy ibis (*Plegadis falcinellus*), and northern pintail (*Anas acuta*).

More than two-thirds of the major commercially important fish species in the Adriatic are considered overfished. Those whose populations are thought to be in the "safe" range—even though they have in several cases seen marked declines in recent-year catch volume—include bogue (*Boops boops*), sprat (*Sprattus sprattus*), pilchard and sardinella (*Sardina pilchardus, Sardinella aurita*), jack mackerel and horse mackerel (*Trachurus picturatus, Trachurus trachurus*).

Human Interaction

There is a long history of human settlement and use in the Adriatic Sea and adjacent coasts. Human activities have influenced marine ecosystems since Roman times, with this influence increasing in the 19th and 20th centuries. Today,

almost all of the original marine resources have been reduced to less than half of their former abundance, with large and mid-sized fish species being most affected. These changes may also make the overall ecosystem less resilient and more vulnerable in the future, as the regional effects from global warming gain in intensity, for example.

Fisheries, marine transport and tourism are important throughout the Adriatic Sea. Technological improvements in the fishing fleet and increased activity driven in part by higher prices, have resulted in a blanket decline in the fish catch rates per boat. Coastal pollution and eutrophication—excess nutrient inflow, typically from agricultural and municipal runoff—have been additional factors in declining fisheries yields. In many cases in the more urbanized northern Adriatic, fish kills have occurred due to algal blooms and low-oxygen conditions.

Shipping trade goods is another Adriatic Sea industry that dates from Roman times, and before. Significant cargo port facilities ring the northern Adriatic; today, tourism is an added generator of mechanized sea traffic and threats to coastal ecosystems. Seeking to encourage "green" practices, the Denmark-based Foundation for Environmental Education has found a ready and willing acceptance by the operating authorities of several hundred Adriatic Sea marinas and beaches of its Blue Flag certification program. These local businesses and governments seem to realize that the extra short-term expense to contain fuel spills, prevent debris dumping, and restrict coastal development will in the long run protect their investment in the healthy ecosystem qualities that attract customers to their facilities.

Venice illustrates a worst-case for polluted coastal waters in the Adriatic, where shipping, transportation, farming, manufacturing, and wastewater combine to heavily pollute the sea. Venice also contains oil refineries, which fortunately have avoided a significant spill that would have extreme consequences on its marshes, species, commercial fisheries, and tourism. There are hydrocarbon resources underlying other sections of the Adriatic Sea, and various controversial proposals for developing them. Just beyond the Strait of Otranto, Northern

Petroleum, a United Kingdom concern, was poised in 2012 to commence seafloor drilling off the coast of the Puglia region, after receiving approval by the Italian Ministry of Environment—even though the 2,550-square-mile (6,600-square-kilometer) area of the sea in question adjoins a host of variously-conserved zones including a Marine Protected Area; a Specially Protected Area of Mediterranean Importance; a National Natural Reserve; and, under a European Union policy centerpiece known as Natura 2000, nine Sites of Community Importance.

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Aegean Sea

Category: Marine and Oceanic Biomes.
Geographic Location: Mediterranean Sea.
Summary: The Aegean Sea, in the northeastern corner of the Mediterranean Sea, is a marine province that shares many climate and biome characteristics with temperate North Atlantic realms.

Within Mediterranean Sea basin, the Aegean Sea forms an embayment surrounded on the west and north by Greece, on the east by Turkey, and on the south by the island of Crete. The area of the Aegean is 82,625 square miles (214,000 square kilometers). It reaches a maximum depth, near Crete, of 11,624 feet (3,543 meters). The area has a complex topography marked by deep trenches and