Atlantic Ocean: Causes And Consequences Of Ocean Acidification

The Atlantic Ocean is the world's second-largest ocean stretching from the Arctic Circle to Antarctica with an area of about 106,460,000 square kilometres. It is bordered by the Americas to the west and Europe and Africa to the east. The Atlantic Ocean is home to many ecosystems and wildlife such as, kelp, sea oats, algae, seaweed, coral, sharks, jellyfish, whales, turtles and stingrays. The Atlantic Ocean plays an important role as it soaks up the heat and transports warm water from the equator to the poles, and cold water from the poles to the tropics. Changes in the Atlantic ocean's environment have a negative impact on humans and marine wildlife globally.

Causes

There are a many factors that contribute to environmental changes in the Atlantic Ocean. The causes include ocean acidity, overfishing, climate change, pollution, changes in currents, and water expansion. Human activity, such as the burning of fossil fuels, deforestation and agricultural production emit tons of carbon dioxide into the atmosphere, which is a greenhouse gas that traps heat into the atmosphere, increasing ocean temperatures.

The increase of carbon dioxide in the atmosphere which dissolves in the water is decreasing the pH level of the ocean, resulting in Atlantic waters to become more acidic. Ocean acidification changes the chemistry of the ocean.

The temperature and sea levels have dramatically risen in the Atlantic Ocean over the years. The number of fishes and other marine organisms have decreased in numbers. The two images below show a comparison of of the abundant cod population and total biomass in 1850 and 2005. The abundance of cod was 12 times lower in 2005 compared to 1850, while the biomass was nearly 30 times lower in 2005 relative to 1850.

Consequences

As greenhouse gases trap more heat in the atmosphere, the Atlantic Ocean is absorbing more heat, resulting in many consequences that effect both the marine life and humanity. Acidification directly affects marine life that builds shells of calcium carbonate such as corals, scallops, and some microscopic plankton that are a foundation of the food web throughout the ocean. These marine organisms provide habitats and food sources for other organisms. Increased acidification can also limit the ability of certain fish to detect their predators, disrupting the food chain.The destruction of coral reefs and shellfish, and the disruption of food chains will have profound effects on humanity, primarily in the form of less food for people who rely on the ocean for it. Acidification also alters the ocean's chemistry, deoxygenating the ocean waters. The Atlantic Ocean is losing the oxygen that is vital to the marine life.

The ocean currents that help warm the Atlantic coasts of Europe and North America have significantly slowed since the 1800s. The weakening of the Atlantic Ocean currents is due to

greenhouse gas emissions. These changes could alter European weather and precipitation patterns, cause sea levels on the US east coast to rise and hurt the vulnerable wildlife.

Effectiveness of Strategies

The South East Atlantic Fisheries Organisation (SEAFO) is an intergovernmental regional fisheries management organisation that maintains over fishing and fishing related acts in the Southeastern Atlantic Ocean. SEAFO is responsible for ensuring the long-term conservation and sustainable use of the fishery resources in the South East Atlantic Ocean. The SEAFO Convention Area is located in the southeast Atlantic region, outside the exclusive economic zones of the coastal states of Angola, South Africa, Namibia, and United Kingdom’s overseas territory of St. Helena and its dependencies Tristan da Cunha and Ascension Island. It covers an area of approximately 16 million square kilometres. The plan to establish SEAFO came from Namibia in 1995. The concern that particular commercially valuable fish stocks required better protection to avoid compromising their potential in Namibian waters as a result of unsustainable fishing practices on the waters of the Atlantic Ocean. The idea was welcomed and greatly supported by the coastal neighbours of South Africa, Angola, and United Kingdom and by distant water fishing nations of EU, Iceland, Japan, Norway, Poland, Korea, Russian Federation, Ukraine and United States.

South East Atlantic Fisheries Organisation has adopted innovative ways to manage overfishing, taking into account the EAF management method, the precautionary approach principles as well as the reliance on the best scientific available evidence. Since 2005, the SEAFO has adopted conservation and management measures, some of which include limiting catches for Patagonian tooth-fish and deep sea red crab in South East Atlantic waters due to concerns on the sustainability of the current fisheries and of the negative impacts on the vulnerable marine habitats and marine food chains, reducing incidental mortality of seabirds and turtles by fishing gear adjustments and other technical measures during fishing operations and quickly releasing turtles entangled in fishing gear, prohibiting the shark finning practice and implementing closed areas in several fragile marine ecosystems such as seamounts to guarantee long-term conservation and protection in line with precautionary approach principles.

These conservation and management measures are ensured to be very effective in terms of managing overfishing and other fishing related acts in the Atlantic Ocean. These measures help the vulnerable marine ecosystems and wildlife.