

## ABNORMAL CHANGES IN THE OCEANS COULD IMPACT THE WHOLE WORLD

The oceans cover 70% of the earth's surface. They provide us with a variety of gifts and services, including abundant food and trade routes, and help maintain the planet's ecological equilibrium. Human activity, however, has damaged the health of the oceans, endangering these important roles. Such adverse impacts have not attracted enough attention. Japan is among the nations striving to fulfill global goals that will protect this vital resource.

The water of the world's oceans has its own immense circulation system that is regulated in part by temperature. In the Atlantic Ocean, seawater cools as it flows past Greenland in the Arctic Circle, becomes more dense and sinks to the ocean floor. It then slows and moves to the south until it passes the southern tip of Africa and crosses into the Indian Ocean. There it merges with water that has cooled in the Antarctic and continues eastward to the Pacific Ocean. The seawater, warmed during that long journey, rises to the surface, and returns westward in the Pacific Ocean, to the Indian Ocean and south around Africa, finally flowing back northward in the Atlantic Ocean.

If the oceans of the world all warmed, the cooling function of the seawater in the Arctic and the Antarctic would be weakened, and the circulation of deep seawater would slow or stop. If that happened, although the exact impact is unclear, there is no doubt that the world's climate, environment, and ecosystem would be greatly affected.

The oceans are also facing acidification due to increased carbon dioxide emissions in the world. According to one es-

timate, the oceans absorb half of the carbon dioxide released into the atmosphere by the burning of fossil fuels such as oil and coal, and when carbon dioxide dissolves in water, the water is acidified. That increase in the carbon dioxide level in the ocean changes the marine environment significantly. It hinders the synthesis of calcium carbonate, which in turn affects living organisms that have calcium carbonate shells, such as shellfish and coral. Because these organisms play a key role in the marine food chain, their disappearance causes tremendous deterioration of the oceanic ecosystem.

In discussions of the conservation of the oceans and marine resources, the main issues have so far been the prevention of marine pollution and the sustainable management of fishery resources, issues that are directly connected with human life. However, thanks to raised awareness of the importance of the marine environment and ecosystem, the need for comprehensive management and sustainable use of the oceans has been recognized widely. Goal 14 of the Sustainable Development Goals (SDGs) refers to that need.

Sustainable Development Goal 14 is summarized as, "Conserve and sustainably use the oceans, seas and marine resources for sustainable development," and it lists ten targets. Those targets include: 1) prevention of all marine pollution such as contamination by land activities; 2) restoration of marine ecosystems; 3) minimization of the impact of ocean acidification; 4) control of fish catch volumes; 5) abolition of illegal and unlimited fisheries; and 6) conservation of at least 10% of coastal and marine areas. An earlier version of such efforts is embodied in the United Nations Convention on the Law of the Sea (adopted in 1982 and in effect since 1994), which established

a new approach to management of the oceans under the principle of management of marine affairs.

## HUMANITY'S SHARED HERITAGE: RIGHTS AND RESPONSIBILITIES

The United Nations Convention on the Law of the Sea established a deep ocean floor mapping system, stipulating that a country's marine territory lies within 12 nautical miles (about 22.2 kilometers) of the country's coasts. The system included rules governing exclusive economic zones and continental shelves, making the marine areas outside nations' marine territories and continental shelves the common property of mankind. The convention also granted maritime countries the exclusive right to develop and utilize the oceans to a distance of 200 miles (about 370 kilometers) from their coasts and demanded that they manage those marine areas responsibly. Since there are no boundaries in the oceans, and since fish migrate extensively, if the natural balance were lost in just one location, that imbalance could spread widely. Clearly, unregulated development and utilization of the oceans carry unpredictable risks. In the 2010s, international discussions of, and efforts toward, ocean conservation and sustainable development and use grew more vigorous. However, while academics and experts are aware of the urgent need for international work to conserve the oceans, most countries and a large segment of the general public lack a sense of crisis.

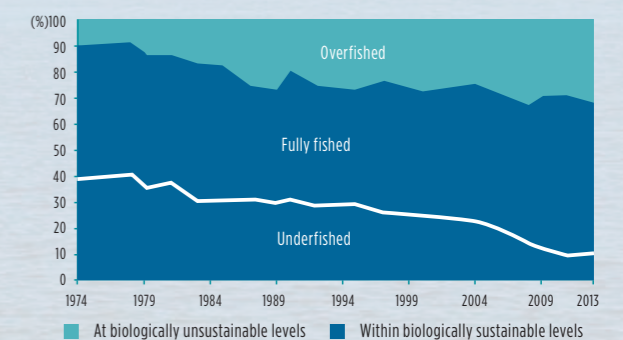
In June of 2017, the United Nations held the Maritime Conference to Support the Implementation of Sustainable Development Goal 14, demonstrating clear global action to protect the sustainability of the oceans. In the United Na-

tions, efforts have been underway since 2015 to develop legally binding documents governing the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction of each country. The movement to protect biodiversity in the open seas is gaining momentum.

Japan, surrounded by seas with climates ranging from subarctic to tropical, and containing many rich fishing grounds, once had a negative impact on the coastal environment and ecosystem through its economic activities. Confronting its regrets and reflecting on past mistakes, Japan has been taking a variety of measures for conservation and sustainable use of marine ecosystems and resources. That practical experience can benefit many countries including the Pacific Islands. For example, although industrial water pollution in Japan created serious environmental health consequences such as Minamata disease, Japan solved those problems over the years, developing water pollution control laws and carrying out preventive measures. Another example is Okinawa's efforts to restore coral reefs damaged by the sedimentation of red soil, which got into the coral reefs from soil as a result of land development. Okinawa has been promoting research and countermeasures to address the red soil problem. Furthermore, small-scale coastal fishery is active in Japan, as it is in many developing countries. This presents an opportunity for sharing knowledge and experience related to the management of marine fishery resources and the promotion of fisheries. Through collaboration among countries, rather than the application of each country's strength and wisdom in isolation, optimal conservation and sustainable use of marine biodiversity and ecosystems can be achieved.

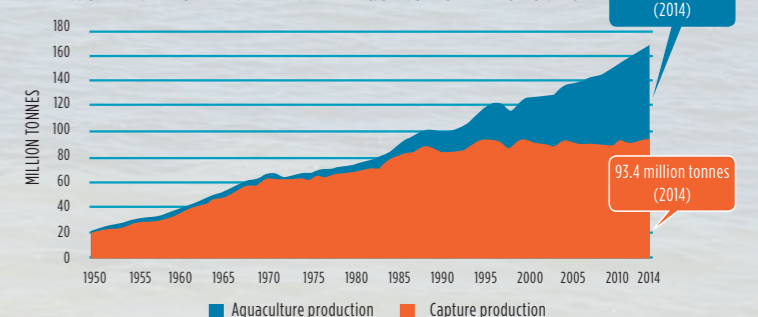
# Change the Oceans, Change the World

GLOBAL TRENDS IN THE STATE OF WORLD MARINE FISH STOCKS SINCE 1974



※ **Underfished:** Undeveloped or new fishery. Believed to have a significant potential for expansion in total production.  
**Fully fished:** The fishery is operating at or close to an optimal yield level, with no expected room for further expansion.  
**Overfished:** The fishery is being exploited at above a level which is believed to be sustainable in the long term, with no potential room for further expansion and a higher risk of stock depletion/collapse.

WORLD CAPTURE FISHERIES AND AQUACULTURE PRODUCTION



Source: FAO The State of World Fisheries and Aquaculture (2016)