Proposals on the Ocean Acidification issues toward the next Japan's Basic Plan on Ocean Policy

(August, 2017)

Ocean acidification(OA) is a problem referred to in recent years as "The Other Carbon Dioxide Problem," as along with global warming it is an environmental impact factor on a global scale. This led in 2015 to its being one of the targets of the UN Sustainable Development Goals (SDGs), which call for efforts to "Minimize and address the impacts of ocean acidification." The Fifth Assessment Report of IPCC points out that if emission reduction measures of carbon dioxide aren't sufficient, ocean acidification might pose a serious risk to marine ecosystems. There are also predictive studies which indicate that areas suitable for reef-building coral will disappear from the seas around Japan by the 2040s due to the rise of water temperature and ocean acidification. At the same time, the predictions do contain uncertainties, so better understanding of the progress of ocean acidification and its impacts on marine creatures and marine ecosystems are urgent issues.
Taking these current situations into consideration, we will submit the following proposals for inclusion in the next Basic Plan on Ocean Policy.

1: Promotion of understanding based on scientific knowledge and consideration of countermeasures

Though there are fears of impacts on marine creatures, etc., current understanding is not sufficient. To address this situation, scientific research on ocean acidification' s impacts on marine creatures and marine ecosystems should be promoted and related analysis technologies developed. In order to monitor the progress of ocean acidification, hydro-chemical time-series observations of 137°E line and K2 station as well as observation at coastal areas should be continued. Also, not only should effective monitoring be promoted that is suitable to the unique characteristics of each ocean area, including coastal areas, but efforts should also be made on related technical development and international standardization.
Based on the scientific knowledge obtained from these activities, studies should be promoted on adaptation measures, such as the specification of less impacted areas and their conservation.

2: Increase international contributions

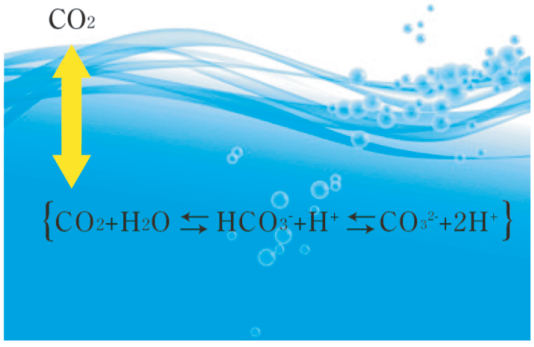
Participate in and contribute to the international framework of data sharing, such as the Global Ocean Acidification Observation Network (GOA-ON). Based on worries over the impacts on reef-building corals, which play an important role in the environments, economies, and disaster prevention in developing countries of the Asian Pacific region, capacity development activities should be aggressively promoted and scientific research such as in situ monitoring should be supported.

3: Promotion of emission reduction measures of carbon dioxide (promotion of mitigation measures)

If emission reduction measures of carbon dioxide aren't sufficient, the ocean environment will be affected seriously through global warming and ocean acidification. Given this situation, work on domestic reduction measures should be steadily carried out and leadership demonstrated internationally towards achievement of the Paris agreement, which called for "keeping global temperature rise well below 2 degrees Celsius" and "pursuing efforts to limit the temperature increase even further to 1.5 degrees Celsius."

4: Promotion of Public Awareness Activities

Ocean acidification is not only an environmental impact factor on a global scale but also an issue that might affect marine ecosystems and fisheries in the future around Japan. Taking these situations into account, public awareness activities should be promoted based on scientific knowledge. It is important to promote public awareness activities with the cooperation of regional communities, indicating the necessity of measures to minimize impacts of ocean acidification in coastal areas, such as by reducing the inflow of organic matter from land.



Fact Sheet

■ “The Future We Want”（Rio+20, 2012）

We call for support to initiatives that address ocean acidification and the impacts of climate change on marine and coastal ecosystems and resources. In this regard, we reiterate the need to work collectively to prevent further ocean acidification, as well as enhance the resilience of marine ecosystems and of the communities whose livelihoods depend on them, and to support marine scientific research, monitoring and observation of ocean acidification and particularly vulnerable ecosystems, including through enhanced international cooperation in this regard.

■ “Sustainable Development Goal（SDGs）”（2015）

Target 14.3: Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels.

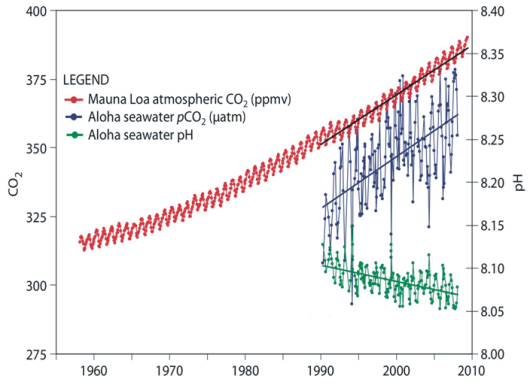


Figure 1. Time series of atmospheric CO_2 at Mauna Loa (ppmv) and surface ocean pH and pCO_2(µatm) at Ocean Station Aloha in the subtropical North Pacific Ocean

Source: Feely, R.A., S.C. Doney and S.R. Cooley (2009), ‘Ocean acidification: present conditions and future changes in a high-CO_2 world’ , *Oceanography*, 22 (4), 36-47.

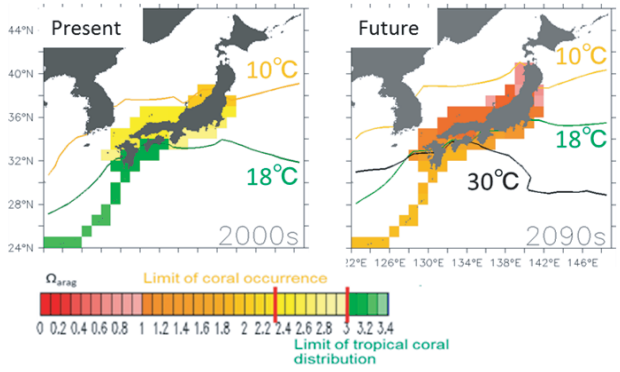


Figure 2. Future prediction using “Business as usual (BAU)” scenario

Source: Yara et al.（2012）Ocean acidification limits temperature- induced poleward expansion of coralhabitats around Japan.

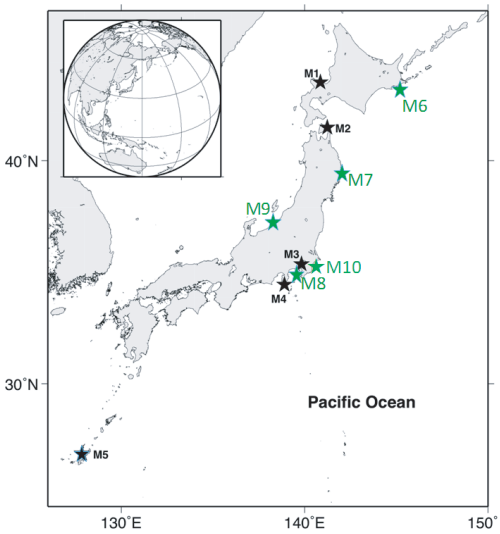


Figure 3. Ongoing Japan-coast pH monitoring sites

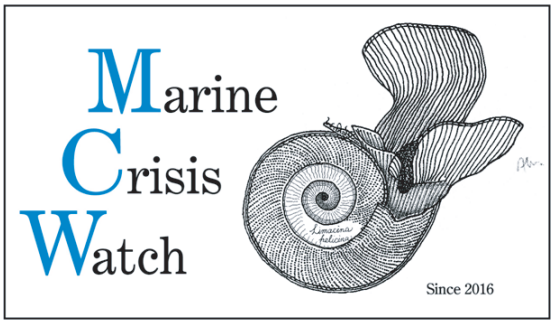
Source: T.Ono, International conference “Impacts of Global Warming and Ocean Acidification on Marine Ecosystems and Necessary Policy Measures” in Tokyo on 19-20 January 2017.

Lectures

Monitoring

Planning

Photos. As part of the efforts to raise public awareness on OA in Japan, OPRI-SPF has been coordinating guest lectures on the issue at Kanagawa Prefectural Marine Science High School since 2016. In August 2017, they started pH monitoring activities in areas near the school.



In order to address the issues of ocean warming and acidification, OPRI-SPF is developing “Marine Crisis Watch” .