

(Provisional Translation)

The Basic Plan on Ocean Policy

Cabinet Decision, May 15, 2018

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Introduction

1. Overview of the Decade since the Enforcement of the Basic Act on Ocean Policy

Surrounded by oceans on all sides, Japan has jurisdiction over one of the largest ocean areas in the world corresponding to approximately twelve times the national land area of Japan. It is incumbent on Japan to protect the seas in order to secure the safety of its people and to protect the national territory, to utilize the seas as the basis for the existence and growth of the economic society, and to leave future generations a legacy in the form of the ocean as a valuable basis for the existence of humankind. Ocean measures comprise a variety of separate measures covering a wide-ranging field. Many of these measures require comprehensive coordination at the government level as well as mutual adjustment and coordination among separate measures since they concern the ocean as a shared place. Therefore, the Basic Act on Ocean Policy (Act No. 33 of 2007) was enacted in July 2007 to comprehensively and systematically promote the full range of measures relating to the ocean with the aim of realizing Japan as a new maritime nation.

Based on this Act, the Meeting of the Headquarters for Ocean Policy was established with the Prime Minister as its Director General while the Headquarters for Ocean Policy was established at the Cabinet Secretariat (currently the National Ocean Policy Secretariat, Cabinet Office) to handle the executive functions for the Headquarters. The Councilors' Meeting, which is comprised of experts appointed by the Prime Minister, was established at the same time. Subsequently, the First Basic Plan on Ocean Policy was approved by the Cabinet in March 2008 and the Second Basic Plan on Ocean Policy in April 2013. There are also annual reports on the progress of the individual measures under the Basic Plan on Ocean Policy.

In addition to presenting Japan's submission of information on the extension of its continental shelf to the Commission on the Limits of the Continental Shelf (CLCS) under the First Basic Plan on Ocean Policy, Japan has also enacted other ocean-related laws and ordinances including Act on the Punishment of and Measures against Acts of Piracy (hereafter the Anti-piracy Act, Act No. 55 of 2009), and the Act on the Development of Base Facilities and Preservation of the Low-Tide Line for the Promotion of Use and Conservation of the EEZ and Continental Shelf (Low-Tide Line Preservation Act) (Act No. 41 of 2010, hereinafter the 'Low-Tide Line Preservation Act'). Other measures that have made steady progress under the First Basic Plan on

Ocean Policy include the seafloor boring trials aimed at developing seafloor polymetallic sulfide deposits (September 2012) and the implementation of offshore production tests aimed at commercial methane hydrate development (March 2013), which are based on the Plan for the Development of Marine Energy and Mineral Resources (March 2009). Other examples of progress are the start of operations at the Marine-related Information Clearing House (March 2010) and the formulation of “How to Establish Marine Protected Areas in Japan” (Appropriate promotion of establishing marine protected areas and improved management of the areas).

Under the Second Basic Plan on Ocean Policy, cross-sectional policies spanning several ministries as determined by the Headquarters for Ocean Policy include the implementation of offshore production tests aimed at the commercial development of methane hydrate (April–June 2017) and the implementation of mining/lifting pilot tests aimed at developing seafloor polymetallic sulfide deposits (August–September 2017), which are both based on the revised Plan for the Development of Marine Energy and Mineral Resources (December 2013). Additional measures include conferring names on remote islands (August 2014), state ownership of ownerless remote islands (registration in the government asset register) (March 2017), the implementation of subsidies to promote measures that support local communities based on the Act on Preservation of Areas of Remote, Inhabited Islands Establishing Territorial Seas and Maintenance of Local Societies on Areas of Specified Remote, Inhabited Islands Establishing Territorial Seas (Act No. 33 of 2016, hereinafter the Act on Preserving Remote Island Areas) (after April 2017), and the Bill for the Act of Promoting Utilization of Sea Areas in Development of Power Generation Facilities Using Maritime Renewable Energy Resources approved by Cabinet decision (March 2018). Other measures include the Future Policy for Extending the Continental Shelf (July 2014) and the Basic Policy concerning Preservation and Management of Remote Islands for Management of the Sea (June 2015), Japan’s Arctic Policy (October 2015), and Efforts to Consolidate the Capability of Maritime Domain Awareness (July 2016).

In addition, when implementing these measures, it is also important to promote the measures in an effective manner based on evaluation of the state of implementation. Therefore, under the Second Basic Plan on Ocean Policy, the Meeting of the Headquarters for Ocean Policy was revised to enhance the framework for the Councilors’ Meeting of the Headquarters for Ocean Policy, to regularly follow up the status of implementation for several measures flagged up in the

Basic Plan on Ocean Policy, to evaluate the status of implementation, and to organize a framework capable of intensive evaluation and analysis by setting up project teams for each theme. As a result, the project teams examined specific measures in all fields including the marine industries.

The measures listed in the Second Basic Plan on Ocean Policy have, on the whole, been implemented. The progress schedules for the systematic implementation of the measures have also been created and evaluated. In addition, where cross-sectional measures spanning several stakeholder government departments are concerned, the Meeting of the Headquarters for Ocean Policy has carried out reviews and taken decisions to establish and expand the frameworks for controlling measures that span several government departments under the Meeting of the Headquarters for Ocean Policy.

On the other hand, since some measures have made insufficient progress, it is necessary to introduce and reinforce methods that link steady progress to the current method for formulating progress schedules and the evaluation of the state of implementation outlined in the plan. Although the National Ocean Policy Secretariat publishes *The Oceans and Measures Implemented by the Government with Regard to the Oceans* annually, in addition to pamphlets aimed at young people, there is still room for improvement in the ability to inform the nation about ocean policy.

2. Current Situation Awareness Based on Recent Circumstances

(1) Current Situation

The dwindling birthrate and aging population, globalization, and accelerating technical innovation in the IT¹ field are among the changes shared across all ocean-related fields. In addition, the main factors behind the changes in each field are listed below.

¹ Information Technology

a. Changes in Maritime Security

The situation in the seas around Japan, including Japanese territorial sea and the Exclusive Economic Zone (EEZ), is becoming increasingly strained with the maritime interests of Japan exposed to more severe threats and risks than ever before. These threats and risks include, for example, intrusions into the territorial sea by foreign official vessels, increased activities of foreign naval vessels such as navigation within Japan's territorial sea and broadening the scope of their activities, illegal operations by foreign fishing vessels and vessels drifting in the sea or drifting ashore, maritime research activities by foreign research vessels inside the EEZ without the consent of Japan, provocation by North Korea including the launch of ballistic missiles which flow over Japan or landed inside Japan's EEZ, and the transportation of materials related to weapons of mass destruction and ballistic missiles.

The sea lines of communication from Japan to the Middle East, Europe, Australia, and the U.S. mainland are important for our country, but in recent years, threats and risks to the stable use of these sea lines of communication have emerged. There have, for example, been attempts to unilaterally change the status quo in the seas including attempts to present such changes as established fact, piracy and armed robbery at sea due to changes in the social environment, illegal acts by terrorist organizations and other international criminal organizations, and cases where regional conflicts have impacted on the smooth and safe operation of Japanese ships.

There are also moves on the international scene to destabilize the international maritime order by, for example, expanding claims on maritime interests where the international legal basis is not always clear.

The prospects for improvements of these circumstances in the medium term are meager. Rather, if the current situation is allowed to be left unsolved, there is a high likelihood of increasing aggravation.

It is also necessary to prepare for natural disasters originating in the ocean such as the risk of disasters caused by high waves and high tides in the wake of typhoons expected to become increasingly severe in the future, or disasters caused by tsunami or wide-area earthquakes including earthquakes in the Nankai Trough. It is also important to focus on responses to large-scale accidents at sea, the loss of life and property due to natural disaster, and Japan's geological

position with active volcanoes and earthquakes.

b. Changing Circumstances Concerning Ocean Industries

In recent years, the new potential of marine energy development and marine resource development has raised expectations. In Europe and elsewhere, we see a growing trend toward introducing ocean-based renewable energy. For Japan's marine industries, the business climate is severe with sluggish oil prices and a continuing trend for excessive tonnage. Fishery resources are also at risk of decline amid the rising global demand for marine products.

c. Changes in the Maintenance and Protection of the Marine Environment

In Japan and elsewhere, the interest in protecting the ocean environment is higher than ever as a range of issues are coming to light including responses to climate change and ocean acidification, the conservation and sustainable use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ), and marine litter including microplastics². International frameworks regarding these global issues are moving forward at the United Nations and other venues.

d. Changes Involving Human Resources Development and Nationals' Understanding

Depopulation, the dwindling birthrate and aging population, globalization and other factors have a major impact on the environment for maintaining and developing maritime human resources. Recently, there is a tendency for people in Japan to lose the connection with the sea as visits to the seaside for swimming or leisure are on the decline.

² Refers to small particles of plastic waste (below 5 mm). There is concern that microplastics and the chemical substances contained and absorbed within them will enter the food chain and have an impact on the ecosystem.

e. Changes Involving Improved Scientific Knowledge of the Oceans, the Arctic Policy, and International Collaboration and Cooperation

Where improved scientific knowledge of the oceans is concerned, The Future of the Seas and Oceans was the main topic of discussion at the G7 Science and Technology Ministers' Meeting held in Tsukuba, Ibaraki, from May 15 to May 17 in 2016. In addition to discussions aimed at establishing policies based on scientific knowledge, the G7 Ise-Shima Summit in 2016 also expressed support for scientific initiatives to manage ocean resources based on scientific knowledge. Goal 14 of the Sustainable Development Goals³, which comprise the 2030 development goals for the global community as a whole, is to conserve and sustainably use the oceans, seas and marine resources for sustainable development (SDG14). There is increasing international recognition that it is necessary to improve scientific knowledge based on ocean observation to achieve this goal.

Concerning the Arctic, the international community is turning its attention to responses to the global issue of rapid changes in the Arctic environment and the shrinking amount of the Arctic Ocean sea ice in recent years, as well as the possibility of using Arctic Sea Routes and resource development.

Where international collaboration and cooperation are concerned, major international conferences on issues related to a broad range of ocean policy are convened on a regular basis. In 2017, the 72nd Session of the United Nations General Assembly announced the United Nations Decade of Ocean Science for Sustainable Development (2021–2030). The increasing recognition of its importance is a move in the right direction, but on the other hand, there are also moves to destabilize the international maritime order as abovementioned.

(2) Current Initiatives in Japan

The following are the main initiatives currently implemented in Japan.

³ Sustainable Development Goals. The international goals for the period from 2016 to 2030 in the 2030 Agenda for Sustainable Development adopted at the UN summit in September 2015. Established 17 comprehensive goals with a deadline of 2030 as development goals for the entire international community including the developed nations.

a. Maritime Security

Based on the National Security Strategy (decided by the National Security Council and the Cabinet in December 2013), Japan in its capacity as a maritime nation has exercised leadership to maintain and develop open and stable seas supported by a sense of order based on the rule of law including the peaceful resolution of conflicts according to international law, and to ensure the freedom and safety of shipping and air traffic, not by force, but by cooperating closely with all countries. Specifically, Japan has dealt with various threats in the sea lines of communication such as pirates and has secured maritime traffic safety, then has promoted maritime security means by enhancing maritime security cooperation with friendly countries.

The Ministry of Defense (MOD) and the Self-Defense Forces (SDF) are strengthening defense structures in response to the increasingly severe security environment in the oceans around Japan. The Japan Coast Guard (JCG) is also reinforcing its maritime security system to enable appropriate responses to the wide range of issues confronting them. In addition, the Legislation for Peace and Security was developed to enable seamless responses to any situation.

Japan is also collaborating closely with its ally the United States, friendly nations, and other countries concerned to prevent the emergence of threats and to strengthen the Japan-U.S. ability to deter and counter threats.

Japan is also assisting with capacity-building in countries along important sea lines of communication and implementing anti-piracy measures on the coast of Somalia and in the Gulf of Aden. A free and open maritime order based on the rule of law is the cornerstone of a stable and prosperous international society. The government is promoting the Free and Open Indo-Pacific Strategy to develop the region into global commons bringing stability and prosperity, without prejudice, to all countries in the region by maintaining and strengthening the free and open maritime order in the Indian and Pacific region.

To prepare against disasters originating in the oceans, Japan is also creating tsunami disaster prevention areas with multiple forms of protection combining tangible and intangible measures such as the designation of tsunami disaster caution zones, state-organized harbor maintenance and sea route protection, and the establishment of shore protection facilities.

b. Industrial Use of the Ocean

Efforts are underway to strengthen the international competitiveness of harbors, which are hubs for ocean transportation and a wide range of industries supporting the development of the oceans including seaborne shipping, shipbuilding, marine industry, construction, and IT. Concerning the development of ocean and mineral resources, initiatives such as offshore production tests for methane hydrate, resource surveys for rare earth muds, and several new discoveries of seafloor polymetallic sulfide deposits are making steady progress. In addition, based on amendments to the Port and Harbor Act (Act No. 218 of 1950) enacted in July 2016 (hereinafter, the amended Port and Harbor Act), there are efforts underway to systematize the rules for occupation rights in ocean areas and to introduce an open application system in order to promote offshore wind power generation. In addition, there are also moves underway to strengthen the management of international fishery resources.

c. Maintain and Protect the Maritime Environment

International initiatives are underway based on the Paris Agreement⁴ adopted at the 21st Conference of the Parties of the UNFCCC on climate change and SDG14. As well formulating the National Biodiversity Strategy of Japan 2012–2020 (decided by the Cabinet in September 2012) and the National Plan for Adaptation to the Impacts of Climate Change (decided by the Cabinet in November 2015) based on these international trends, Japan is also pushing forward with various initiatives to protect the ocean environment.

d. Develop Human Resources with Knowledge of the Ocean and Advance Nationals' Understanding

⁴ Adopted at the 21st Conference of the Parties to the UNFCCC (COP21) in December 2015, the Paris Agreement replaces the Kyoto Protocol and will set reductions for greenhouse gas emissions as of 2020. The key points of the Paris Agreement are a long-term universal target of 2°C while pursuing efforts to limit the temperature increase to 1.5°C. All countries including the main emitters shall submit and renew their reduction targets every five years. All countries shall review and report on the implementation situation in a shared and flexible manner.

The aim of the guidelines for the elementary and junior high school curriculum announced in 2017 is to improve education concerning Japan's territory, which is comprised of numerous islands surrounded by the ocean. The Nippon Platform for Marine Education⁵, which aims to implement appropriate marine education in all municipalities, is also taking shape.

The Nippon Foundation Ocean Innovation Consortium⁶, which was set up to train the strategic human resources who will power the marine industries, is also promoting initiatives to build international networks based on university-industry-government collaboration.

In addition, Marine Day and Ocean Month provide opportunities to boost understanding and interest in the ocean among nationals.

e. Improved Scientific Knowledge, Arctic Policy, and International Collaboration and Cooperation

In terms of efforts to improve scientific knowledge, initiatives such as ocean surveys, and research and development are contributing to responses to ocean resources development, climate change, and other global issues.

As well as formulating Japan's Arctic Policy (decided by the Meeting of the Headquarters for Ocean Policy in October 2015), current efforts concerning a policy for the Arctic draw on Japan's strength in science and technology with a focus on the three areas of research and development, international cooperation, and sustainable use.

As well as promoting international collaboration and cooperation in various areas in a manner worthy of the maritime nation, Japan is also assuming a leading role in formulating new frameworks and rules, using international conferences and other venues to call for the importance of the rule of law to the international community. Other initiatives include the Free and Open

⁵ In a message on the occasion of Marine Day on July 18, 2016, the Prime Minister announced the launch of the Nippon Platform for Marine Education, an initiative to promote and reinforce marine education across Japan through the efforts of industry, academia, and government. The aim of the Platform is to provide marine education in all municipalities by 2025.

⁶ Established in October 2016, the Consortium is an integrated platform for industry, academia, and government to train marine development engineers (the Nippon Foundation acts as the secretariat). The initiative was first broached in a speech at the Grand Opening Ceremony for Special Events to commemorate the twentieth Marine Day on July 20, 2015, when the Prime Minister announced the launch of the Project to Cultivate Marine Pioneers of the Future, a consortium of industry, academia, and government implementing training for marine engineers across Japan.

Indo-Pacific Strategy.

(3) Government Structures for Promoting Measures Regarding the Ocean

When promoting ocean measures, it is important for the government as a whole to advance comprehensive measures through mutual collaboration and coordination by means of bilateral discussion, and for the government departments with knowledge and jurisdiction over individual measures to take a responsible approach. It is also necessary to ensure the integrity of the government as a whole while responding more swiftly and with more flexibility to sudden changes in the situations at sea. Accordingly, it has become necessary for the Headquarters for Ocean Policy to join with the National Ocean Policy Secretariat, which takes the lead on practical matters, to fulfill a control tower function for the government.

To ensure the steady implementation of measures, it is important to introduce and reinforce methods of carrying out integrated and continuous evaluations of progress schedules and the status of their implementation in light of measures implemented by the relevant government departments based on the Basic Plan on Ocean Policy under the Headquarters for Ocean Policy. It is also important for stakeholders to collaborate with each other on the proposed measures in order to communicate clear messages to the nation.

(4) Structure of The Third Basic Plan on Ocean Policy

Based on the awareness of the current situation outlined in the Introduction, Chapter 1 of the Third Basic Plan on Ocean Policy (hereinafter ‘the Plan’) determines the nature of ocean policy as the philosophy and direction of ocean policy over the next decade, and the basic objectives of ocean measures as Comprehensive Maritime Security and the basic objectives of major measures regarding the oceans.

In keeping with the basic objectives outlined in Chapter 1, Chapter 2 specifies measures slated for intensive implementation, measures to be implemented in close collaboration with stakeholder organizations, and ocean measures that will require comprehensive and systematic implementation over the next five years.

To steadily advance the Plan, Chapter 3 determines the investigation framework and administrative functions of the Councilors' Meeting as well as consistent implementation by examining and reviewing the measures and their progress. Chapter 3 also determines the matters required for the comprehensive and systematic implementation of ocean measures including stakeholder responsibilities, mutual collaboration, and constructive information disclosure.

Chapter 1. Nature of Ocean Policy

1. Basic Principles and Policy Direction in the Next 10 Years

(1) Basic Principles

a. The Basic Principles of the Basic Act on Ocean Policy

Bearing in mind the importance of international collaboration to the creation of the new maritime nation, Article 1 of The Basic Act on Ocean Policy states that the purpose of the Act is to contribute to harmony between the ocean and humankind as well as improved stability for the Japanese people, and the sound development of the Japanese economy. In accordance with the six basic principles listed in Articles 2 to 7 (Harmonization of Development and Use of the Ocean with the Conservation of Marine Environment, Securing Safety at Sea, Improvement of Scientific Knowledge of the Ocean, Sound Development of Ocean Industries, Comprehensive Management of the Ocean and International Partnership with regard to Ocean), the Act formulates and implements measures regarding the ocean in a way that is both comprehensive and systematic. Still today, ten years after the Act was enforced, we must continue to adhere to these basic principles.

b. Basic Principles Concerning the Formulation and Implementation of the Plan

The six basic principles outlined in the Basic Act on Ocean Policy form the premise and foundation for the basic principles of formulating and implementing the Plan. As stated in the Introduction, we must take into consideration the recent changes in circumstances based on the status of implementation and evaluation of past ocean policy.

The basic principles concerning the formulation and implementation of the Plan constitute the guidelines for defining the fundamental objectives of each measure as well as the direction of ocean policy outlined below in (2), and in Chapters 2 and 3. They must also function as signposts when implementing the measures based on the Plan.

In addition to recognizing unchanging phenomena such as the severity and abundance of the

oceans, the intrinsic nature of the oceans as the foundation for economic society and as an international public good, the climate-induced volatility in the marine environment, and vulnerability to ocean pollution or natural disasters originating in the ocean, these basic principles must be based on a broad-based and long-term perspective that looks toward the future and how the situation will develop for ocean-based industries, technologies, and human resources, as well as the situation in the oceans near Japan and worldwide in light of recent circumstances and the changes in the decade since the enforcement of The Basic Act on Ocean Policy.

Based on this approach, the basic principle for the formulation and implementation of the Plan is the advancement of ocean policy in full understanding of the points listed below in light of the basic principles of the Basic Act on Ocean Policy.

① Respect for freedom, democracy, and fundamental human rights, as well as the rule of law, form the foundation that supports world peace, security and prosperity. When realizing the open and stable seas, we will make even greater efforts to actively create an environment and circumstances that are favorable to Japan.

Japan depends on overseas imports for nearly all the raw materials that provide the foundation for the daily lives of people in Japan including major resources such as oil, coal, and iron ore, as well as food, clothing, and shelter. Maritime transport accounts for 99.6% of Japan's trade volume. In addition, the maritime transport routes span a vast area of the ocean including Southeast Asia, the Indian Ocean and the Pacific Ocean. Meanwhile, with the advance of globalization, a variety of threats easily cross national borders in the international community of today. No country on its own is able to achieve prosperity or safeguard the peace and security of their own nation.

In this situation, it is a given that in our capacity of an oceanic nation aspiring to open and stable seas—a nation that adheres to the universal values of the rule of law, respects freedom, democracy, and fundamental human rights, and has achieved economic growth by developing ocean resources and maritime trade—Japan will continue to safeguard the peace and security in our country through our own efforts, but at the same time, it is possible to secure the prosperity, and peace and security of our country through the Free and Open Indo-Pacific Strategy and other

initiatives to make the world a more peaceful and safer place. To secure the maritime transport routes, it is important not only to participate in the management of the main harbors in the countries along the sea lines of communication, but also to be involved with strategic initiatives that consider the urban and industrial infrastructure in the harbor hinterlands, as well the transport infrastructures that link them to each other. In this case, it is in the long-term interest of Japan to ensure transparency and to pay attention to the economic situation in partner countries. We must also recognize that maintaining and strengthening the free and open maritime order based on the rule of law is the cornerstone of a stable and prosperous international society.

To accomplish these goals in a reliable and effective manner over the long term, it is crucial to aim to actively create an environment and circumstances that are favorable to Japan by proceeding in response to the changing circumstances.

② Even in the face of future depopulation, continue to maintain national power based on improved technical capabilities that will enhance the international competitiveness of Japanese industry. Therefore, it is important to maximize the potential and abundance of the oceans while bearing in mind the importance of initiatives to secure marine interests.

The population of Japan is projected to decrease to around 100 million in the year 2050⁷, but in the same year, the global population is estimated to reach ten billion⁸. Massive increases in the population of Africa, India, and Southeast Asia are expected to further raise the risks around securing food, energy, and other resources. In the context of the growing awareness of marine rights and interests in the countries surrounding Japan, the risks and threats to Japan's economic security are also increasing. Under these circumstances, it is important to secure stable supplies of foodstuffs and resources and to aim to secure the supplies within Japan, to make plans for strengthening the industrial foundation and maintaining growth, to maintain the national power of Japan, and to secure the population security of life and limb as well as productive lives.

⁷ National Institute of Population and Social Security Research. Population Projections for Japan (2017)

⁸ United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision.

Therefore, we should leverage Japan's jurisdiction over one of the largest ocean areas in the world⁹ to develop the bounties of the sea including ocean resources and renewable energy. To do so, it is necessary for Japan to mobilize its own power to secure the resources and energy that comprise the wellspring of Japan's national strength, to promote industry, to deliver solid support for facilitating research and technology development, and to maintain and strengthen the hub functions that provide the foundation for these activities in the vast ocean areas.

When securing marine rights and interests, it makes sense to have a legitimate basis under international law and to respond resolutely to threatening developments, but it is important not to settle for this. In the international community, a steady and straightforward focus on developing, using, and protecting the oceans in line with international law, and to appropriately and continuously exercise the rights of one's own country are important elements when securing marine rights and interests. It is important to note that this tends to earn the respect of the international community.

③ Leave future generations a legacy in the form of the ocean as a valuable shared asset for humankind. To do so, it is important to lead the world on measures to protect the environment and to promote the integrity of environmental protection and the sustainable use and development of the ocean by cultivating sound marine industries.

The noteworthy research on planetary boundaries¹⁰ is an example of a method that objectively evaluates the impact of the destruction of the ecosystem and biodiversity, climate change, ocean acidification and other major changes in the functions of the global system caused by human activity. Considering that the population is expected to reach approximately ten billion, it is important to increase the sustainability of the entire planet in order to leave future generations a legacy of beautiful and abundant seas as a shared asset for humankind within these planetary

⁹ The area comprising Japan's territorial waters (including inland waters) and the EEZ is the sixth largest in the world, but eighth in the world if the ocean areas belonging to the overseas territories of other countries are included.

¹⁰ Johan Rockström et al. "A safe operating space for humanity." *Nature*, 24 September 2009, Vol. 461. Will Steffen et al. "Planetary boundaries: Guiding human development on a changing planet." *Science*, 13 February 2015, Vol. 347, Issue 6223. Annual Report on the Environment, the Sound Material-Cycle Society and Biodiversity in Japan 2017

boundaries.

As a result of climate change, rising ocean temperatures and ocean acidification are the cause of abnormal weather, coral reef bleaching, and other environmental problems on a global scale. The projections for rising sea water levels are of great concern to island nations and coastal regions where coastlines will be eroded and islands submerged. Another concern is the adverse impact on ecosystems of microplastics in ocean waste.

As an oceanic nation Japan occupies an important position in the international community. Japan has caused ocean pollution during economic growth stages in the past, but it goes without saying that Japan should act as a world leader with an independent and pioneering role in international initiatives to protect the marine environment by leveraging the experience of cumulated efforts to overcome the pollution issue. Since the water in the oceans is circulated by ocean currents, there are limits on what individual nations and regions can do. Therefore, it is necessary to share values and mobilize strengths that cross national and regional boundaries in order for the whole planet to continue to enjoy the bounties of the sea.

Comprehensive management of the oceans, which implements the sustainable development, use, and protection of the oceans in a comprehensive and integrated manner, is one of the fundamental initiatives. In addition to the importance of individual environmental measures, it is necessary to develop new directions that are in agreement with environmental protection and the development and use of the oceans, and to fully recognize the importance of continuously promoting environmental protection to promote the sustainable use and development of the oceans by sound marine industries and to aim for socioeconomic stability and development that includes the marine industries. It is necessary to increase the effectiveness of environmental protection, and to develop a win-win¹¹ relationship with sustainable development and environmental protection. This ties in with the understanding and support of the public. Therefore, it is necessary to simultaneously promote both ocean management and the sustainable development and use of the oceans based on international laws related to the United Nations Convention on the Law of the Sea, and in full recognition of the ocean management initiatives by all countries and the action requests related to ocean management in the Call for Action

¹¹ Advantageous or satisfactory to all parties involved (Merriam-Webster)

adopted at the UN summit of countries in support of implementing SDG14.

- ④ Developing Japan's strengths in science and technology and promoting research and development that is the world's most advanced are essential prerequisites for ocean policy, which includes continuous observation and surveys to understand the ocean.

Technologies have evolved since ancient times—from dugouts, rowing boats, sailing boats and steamships to more recent improvements such as the development of energy efficient ships and LNG¹² powered ships, faster and larger ships, improved navigation, improved security, as well as technologies for ocean resource development such as deep-sea exploration vessels and improved boring technologies, environmental protection technologies, ocean cleanup technologies, and improved survey and observation technologies. As is evident from this single example, these technologies have increased the convenience and usefulness of ocean-related fields, developed unexplored fields, contributed to human progress, and improved the future outlook for the oceans. The effect of ocean measures has increased rapidly with the development of ocean technologies.

At present, we are seeing the start of conflicts around global competition and interests with regard to the development of ocean science and technology, or predominance in ocean-related fields such as the unexplored frontiers of the Arctic Sea and the ocean depths. These are areas where Japan must also occupy a position of predominance. For Japan, the *monozukuri* superpower, it is a pivotal issue to maintain global leadership in the field of technology development in the marine industries, to strengthen engineering capabilities, innovation, and the world's most innovative technology development including partial and full automation, and the use of satellites in a range of activities such as ocean development and utilization, ocean surveys and observation.

Since advancement in the research and development of ocean science and technology is the basis for various ocean measures, it is doubtful that we will be able to secure the safety and stability of Japan, to enjoy prosperity, and to maintain the national strength without delivering

¹² Liquefied Natural Gas

such advancement. It is also important to fully recognize that it will be impossible to contribute to the protection of the marine environment.

- ⑤ Securing nationals' understanding of ocean measures and increasing opportunities for the whole country, including children and young people, to aspire to and feel familiarity with the sea, and to play and experience the sea are important issues that should be the undercurrent for all measures.

As children, many Japanese people used to be excited by stories about adventures at sea such as *Treasure Island* or *Twenty Thousand Leagues Under the Sea*. Seaside schools created fun memories and the ocean was romantic, a place to have personal experiences and adventures. For Japanese people, the ocean was a fun and familiar place where they would enjoy ocean swimming, digging for shellfish, and fishing, or be impressed by graceful sailboats. Traditions and cultures across Japan carry the legacy of living in coexistence with the ocean, the respect for the occasional fierceness of the seas, as well as the abundant gifts it brought people. However, recently, the Japanese have lost the connection to the sea with surveys¹³ showing a decrease in the number of people who visit the sea or have personal experiences of the sea.

If this situation continues amid depopulation, it will have a negative influence on public understanding of the ocean measures that are important to the nation, and on securing the human resources to work in marine-related fields. We must make sure that every citizen, including children and young people, have an accurate understanding of the importance of the ocean, its blessings and threats, as well as the dormant and new potential that resides in the ocean. We must make better use of activities such as Ocean Day, focus more energy on enhancing marine-related education in schools and on handing down the legacy and traditions related to the ocean. Above all, we must impress on all stakeholders involved in the marine-related fields that it is possible to continue to prosper as an oceanic nation on a foundation of public understanding of the oceans.

¹³ Online survey by the Nippon Foundation in April/May 2017. The survey attracted 11,600 responses from men and women aged 15 to 69 across the country. One in three people in their teens (29.6%) said that they do not feel comfortable when they come into contact with the ocean.

(2) Directions

To comprehensively and systematically promote ocean measures according to the basic principles listed in (1) above, the Plan determines the directions of ocean policy as outlined below in what is known as the challenge toward a new maritime nation. The basic objectives for measures that keep to these directions are established in the next section, “Basic Policy for Measures Regarding the Ocean.”

a. The Challenge Toward a New Maritime nation

The following items are the main points of the ocean policy direction.

To protect the sovereignty and sovereign rights of the “Territorial Waters, etc.” (hereinafter, this is the term for Japan’s internal waters, territorial waters, contiguous zone, exclusive economic zone [EEZ] and continental shelf.) including marine rights and interests such as the fishing industry and ocean development as well as the peace and security of Japan, the lives and limb of the people of Japan, and their property. To do so, we will maintain and strengthen the maritime order based on the rule of law and international cooperation and collaboration. We will constantly improve the lives of the people of Japan to allow them to enjoy continuous prosperity in the future based on maximum utilization of the benefits of the oceans as the cornerstone for promoting the industrial use of the oceans. In addition, we will promote strong and effective ocean policy to facilitate future generations a legacy in the form of a beautiful and abundant ocean that is a valuable shared asset for humankind.

Therefore, we aim to advance comprehensive management of the oceans and the effective use of the vast area of the ocean that contributes to Japan’s national interests, to advance new developments that are in agreement with both environmental protection and ocean exploration and use, while bearing in mind their sustainable development and use, and to make the leap toward the new oceanic nation that will accomplish these aims based on international rules and supported by the world’s foremost ocean science and technology, outstanding human resources with knowledge of the ocean, and nationals’

understanding.

To deliver these outcomes, the government aims more than ever before to act as one to develop comprehensive and systematic policies, to steadily implement ocean measures in an integrated manner and in mutual collaboration and cooperation with the ambitions of stakeholders, including local governments and entrepreneurs in the marine industries, and to realize the maritime nation with nationals’ understanding and support, reminding them once again that Japan is an maritime nation surrounded by oceans on all sides.

b. Clarifying the Direction of Ocean Policy in light of the Basic Principles

The following is a clarification of the direction of ocean policy outlined in the previous “The Challenge Toward a New Maritime nation” section, in the context of the six basic principles of the Basic Act on Ocean Policy.

In light of the severe security environment surrounding Japan, we will first develop a broad understanding of maritime security on the oceans before expanding policies to further strengthen past initiatives regarding Securing Safety at Sea.

Next, since the basic principles of Harmonization of Development and Use of the Ocean with the Conservation of Marine Environment, Comprehensive Management of the Ocean, and International Partnership with regard to Oceans are interrelated, we will work toward effective policy development to advance these principles in an integrated manner.

We will tackle Improvement of Scientific Knowledge of the Ocean as an important policy in light of the rise in international recognition of the importance of maintaining maritime order based on scientific knowledge.

We also work toward the steady development of policies involving International Partnership with regard to the Ocean in order to advance initiatives where the rule of law and enhanced scientific knowledge work together to activate the rule of law as the universal standard for the international community amid the rise in awareness of the marine rights and interests of other countries.

In light of the basic principles of the Plan listed in (1) above, and in light of the dwindling birthrate and aging population, globalization, and accelerating technology innovation in the IT

field, we are also strengthening initiatives to promote human resources retention and training, which is an important social infrastructure. At the same time, we are developing measures to increase nationals' understanding of the ocean measures based on the Plan by placing the emphasis on effective and clear communication with the nation from a media strategy perspective in collaboration with stakeholders.

c. Specific Descriptions of Ocean Policy Direction

The following is a concise summary of the ocean policy directions outlined in the above section, “The Challenge Toward a New Maritime nation.”

○ Toward open and stable seas. Protect the nation and its nationals.

In light of the security situation at sea and the expansion of Japan's marine rights and interests, we are implementing the necessary policies in the form of Comprehensive Maritime Security, a package of measures that takes a broad view of maritime security measures and measures that form the foundation which contribute to reinforcement of maritime security (see below further details).

The objectives are to ensure the security of Japan, to protect Japanese interests in the “Territorial Waters, etc.”, and to ensure the security of sea lines of communication. At the same time, we will create a marine environment that is favorable to Japan by advancing a wide variety of initiatives including the Free and Open Indo-Pacific Strategy to maintain and strengthen a free and open maritime order based on the rule of law. In addition, we are doubling diplomatic efforts to ensure that the legal standing and the marine rights and interests of Japan are not harmed amid the lack of defined borders for the EEZ, the continental shelf etc. with neighboring countries etc. We are also pursuing economic prosperity for Japan through improved connectivity based on overseas transport routes and high-quality infrastructure in line with international standards. Aiming to make Japan resilient to disaster, we are making rigorous preparations for disasters originating in the ocean.

These measures will protect the life, limb, and property of people in Japan contribute in

significant ways to maintaining and developing living conditions and economic activities.

○ **Use seas to make the nation prosper. Pass on abundant sea to posterity**

We will advance sustainable development and use of the oceans in the areas around Japan and we aim to encourage and create a diverse ocean industry through revitalization including productivity improvement. Where the protection of the marine environment is concerned, we will leverage past experience and act as a world leader with an independent and pioneering role. We aim to shape an area of the ocean that facilitates sustainable and systematic use.

Aiming to integrate and expand stronger and more effective implementation of protections for the marine environment and the sustainable use and development of the ocean by promoting industrial use of the ocean and encouraging the marine industries, we are expanding ocean policy in new directions that conform with environmental protections and the sustainable development and use of the oceans while giving due consideration to comprehensive ocean management perspectives. Based on international law related to the United Nations Convention on the Law of the Sea, we plan to develop policies to simultaneously implement management and sustainable use and development of our ocean areas while recognizing trends in ocean management initiatives.

These policies will contribute greatly to creating affluent lives and wealth based on growth, maximize the social and economic potential in the oceans, and focus on securing marine rights and interests while protecting the marine environment and passing on a legacy of a beautiful and abundant ocean to future generations.

○ **Challenge unknown seas. Improve technology and enhance awareness of sea**

We will advance research and development that contributes to the creation of new innovation. We will also strengthen initiatives to improve science and technology of strategic importance to the nation and to create intellectual property for humanity based on researching unknown areas of the ocean including the deep sea. We will make maximum use of Japan's science and technology to continually tackle global solutions to climate change and natural disasters originating in the ocean from a long-term perspective. In addition, we will endeavor to maintain

and strengthen effective and efficient ocean observation networks using science and technology to properly understand the situation in the oceans.

We aim to make a global contribution and to be a world leader in the field of ocean science through these measures.

○ **Take the lead to realize peace. Create world standards for seas.**

First come, first served is a familiar phrase. As a result of the changing circumstances, the next step for Japan is to make the creation of an environment that is favorable to Japan the goal of international collaboration and cooperation. Therefore, Japan will take the lead on establishing the rule of law at sea and comply with international rules focused on the UN Convention on the Law of the Sea when dealing with solutions to global marine problems or maintaining and reinforcing the maritime order. We will take action to instill the Rule of Law at Sea and Policies based on Scientific Knowledge as the universal standard for the international community when shaping new frameworks and rules.

○ **Familiarize people with seas. Develop human resources with knowledge of ocean**

As well as promoting marine education in schools, we will also develop diverse human resources who will support efforts to realize the maritime nation. In addition to familiarizing people with the seaside by increasing opportunities to come into contact with the ocean, we will take a PR strategic approach to expanding the dissemination of information including the content and implementation of various ocean measures, the importance of marine industries, the significance of science and technology, and the appeal of heritage, tradition and culture.

As well as aiming to develop the human resources that are the foundation of the marine industries, these approaches will deepen interest and promote understanding of the oceans among Japanese people, effectively promote ocean measures, and contribute greatly to coexistence between the ocean and humankind in the future.

2. Basic Policy for Measures Regarding the Ocean

2-1. The Basic Policy for Comprehensive Maritime Security

In light of the maritime security situation and the expansion of Japan's marine rights and interests, it is necessary to have a broad understanding of ocean policies across a range of fields related to maritime security, and to present the necessary policies for Japan to achieve prosperity and peace and security as an oceanic nation. Therefore, as explained in detail in (2) below, in addition to the maritime security measures in the Plan, measures with aspects that contribute to maritime security are positioned as measures that form the foundation which contribute to reinforcement of maritime security even if security is not necessarily their sole and main purpose. The government includes both types of measures in its Comprehensive Maritime Security and will act as one to promote integrated initiatives under this approach.

(1) Maritime Security

As the National Security Strategy points out, in the present international community where globalization continues apace and threats easily cross borders, no country is able to maintain the peace and security on its own. Such trends are particularly striking in the maritime field.

Where maritime security is concerned, Japan has been promoting the necessary measures to create an international strategy environment that is advantageous to Japan and to shape a maritime order that contributes to peace and stability in Japan and internationally, as well as to ensure long-term and stable marine rights and interests, which are the foundation of prosperity and economic viability, and to protect the peace and security of Japan not by our own efforts alone, but in cooperation with the international community. As a government, we have put in place wide-ranging security measures, including the maritime security measures in the National Security Strategy, and we will promote the range of measures that form the core concepts in the Comprehensive Maritime Security referred to earlier. We also promote the Free and Open Indo-Pacific Strategy in cooperation and collaboration with the stakeholder nations.

The following three points outline the direction of maritime security for Japan over the next decade.

a. Secure National Interests in Japan’s “Territorial Waters, etc.”

In order to maintain peace and stability in the “Territorial Waters, etc.” of Japan, to ensure the safety of life, and property of people in Japan, as well as development and other marine rights and interests in addition to the long-term stability of national interests such as peace of mind for the nation, we will reinforce the necessary deterrence and coping skills mainly through our own efforts while building systems that will collect, analyze, and share information about the ocean. Based on the Policy on the Strengthening of the Coast Guard System (decided by the Ministerial Council on the Strengthening of the Maritime Security System in December 2016), we will strengthen the ability to enforce maritime law in order to prevent unexpected situations and their escalation. In addition, we will prevent the unexpected emergence of threats in more than normally close collaboration with allied and friendly nations. In the unlikely event of a threat, we will eliminate the threat and minimize the damage.

In addition, from the perspective of ensuring the security and peace of minds of people in Japan, we, as government, recognize and continue to deal with the important problem of illegal operations by foreign fishing vessels and vessels drifting in the sea or drifting ashore. To guard against the risk of natural disaster, we are preparing collaborative structures across government ministries and agencies while steadily advancing provisions to prevent and reduce damage.

b. Secure Stable Use of Japan’s Important Sea Line of Communications

In view of the stable use of sea lines of communication that are important to Japan, we will take measures to improve the security environment along these sea lines of communication by strengthening collaboration with mainly allied and friendly nations and the countries located along the sea lines of communication (hereinafter referred as countries along the sea lines of communication).

c. Strengthen the International Maritime Order to Ensure Freedom of Use of the Oceans

To maintain a maritime security environment capable of securing the stable use of the oceans for Japan, we will shape and reinforce maritime order governed by laws and rules through diplomatic efforts, personal contributions and other active behavior while collaborating with every country that shares universal values.

(2) Foundation for Contributing to Reinforcement of Maritime Security

As stated above, under the Plan, measures with aspects that contribute to maritime security are positioned as measures that form the foundation which contribute to reinforcement of maritime security even if security is not necessarily their sole and main purpose.

Moreover, we will intensify the initiatives by organizing the foundation as (1) measures that form the bases for maritime security, which are more closely related to maritime security and which, when implemented, have a direct bearing on bases for maritime security, and (2) measures that support maritime security, which in the past have been perceived as having a more indirect relationship with maritime security but which, when implemented, support maritime security.

a. Measures that form the basis for Maritime Security

① Establishment of Structures for Maritime Domain Awareness (MDA)¹⁴

MDA is a comprehensive initiative that uses diverse information about the ocean not only for maritime security, but also to promote ocean policy including science and technology development, marine industry promotion, and marine environment protection. Collecting and integrating various pieces of information relating to the ocean in a timely and appropriate manner, which is the premise for MDA, is linked to early detection of threats to maritime security. In view of its importance, MDA is prioritized in the Plan.

¹⁴ Maritime Domain Awareness. The efficient understanding of situations associated with the oceans while bearing in mind how to handle the effective collection, consolidation, and sharing of diverse information about the ocean that contribute to maritime security, ocean environmental protection, marine industry promotion, and science and technology development.

② Preservation and Management of Remote Islands

Protecting and managing the remote islands that are the basis for the outer edge of the territorial waters and the EEZ¹⁵ by reinforcing their functions as sites of activity and protecting the low tide line protection will bring benefits such as the use of the ocean resources in Japan's vast EEZ. Since this is also an important measure from the viewpoint of protecting Japanese territory, it has been prioritized in the Plan.

③ Ocean Surveys, Ocean Observations

The purposes and effects of ocean surveys and ocean observations are diverse. As a whole, surveys and observation contribute to stronger maritime security, but they can also be used for a variety of other purposes such as protection of the marine environment and utilization of ocean resources.

④ Science and Technology, R&D

Aiming to advance science and technology is not only directly connected to promoting the marine industry, but it is also significant as the basis for several fields related to ocean security. From a long-term perspective, it is important to aim to promote the research and development of technologies that can be useful to both the security field and the commercial field.

⑤ Human Resources Development and Awareness-Raising

The range of maritime-related activities send out a message to the general public that maritime security is secured whereas training human resources with knowledge of maritime security contributes to the reinforcement of maritime security. Such human resource development and furthering of understanding are important to communicate information about the ocean at home and abroad.

¹⁵ Refers to EEZ in Article 1-1 of the Act on Exclusive Economic Zone and Continental Shelf (Act No. 74 of 1996), and the continental shelf in Article 1-2 of the same Act.

b. Measures that Support Maritime Security

① Economic Security

In addition to contributing to a secure supply of energy and mineral resources, promoting the use of ocean resources in Japan's EEZ is important from the perspective of ensuring marine rights and interests. Encouraging the fisheries industry is linked to stronger border surveillance functions focused on fishermen and fishery cooperative associations, and to support structures by organized volunteers, primarily fishermen, when accidents occur at sea.

As well as maintaining and strengthening the international competitiveness of Japan's merchant fleet and maintaining stable maritime transport structures centered on Japanese ships and crew, it is important for the economic security of Japan to strategically develop harbors in Japan and to participate in building and operating infrastructure at the principal ports in countries along the sea lines of communication. This also contributes to security from the perspective of ensuring maritime transport at the time of a disaster.

Strengthening international competitiveness and promoting shipping, shipbuilding, and other marine industries is connected to improved technological strength, which is the foundation for economic strength and defense capability. Another effect is to maintain and improve the maritime security environment.

② Protect Marine Environment etc.

The steady implementation of initiatives to protect the marine environment in the area of the ocean under its jurisdiction presents Japan's ability to manage its jurisdiction to a domestic and international audience. Reducing the impact of natural disasters in other countries by sharing the climate change data that Japan has collected creates a desirable security environment for Japan.

2-2 Basic Policy for Other Main Measures

(1) Promotion of Industrial Use of the Ocean

a. Basic Policy for Promotion of Industrial Use of the Ocean

In harmony with the protection of the ocean environment, the promotion of industrial use of the ocean aims for wealth and prosperity based on the development and utilization of the ocean by expanding ocean-based economic activities including maritime transport, fisheries, resource development, and the activities of industries that supply them with goods and services.

The following three points have important policy significance for the promotion of the industrial use of the ocean.

- ① The revitalization of maritime transport, fisheries, resource development and other ocean-based economic activities contribute to economic security.
- ② Expanding ocean-based businesses contributes to delivering economic growth
- ③ Expanding economic activities in Japan's area of the ocean will increase our bargaining power in international negotiations and contribute to securing marine interests.

The significance of each of these three points is demonstrated in their independent policy areas, but the effect is enhanced when they are inter-related and interdependent. Therefore, strengthening collaboration between initiatives in these three policy areas and promoting them in an integrated manner are the basic objectives of the policy for promoting the industrial use of the ocean. Bearing this point in mind, each ministry and agency concerned will implement measures in collaboration while sharing progress when promoting measures in the future.

b. Develop Energy Resources Derived from the Ocean

Methane hydrate, seafloor polymetallic sulfides, rare earth muds and other ocean-derived energy resources present in Japan's "Territorial Waters, etc." are valuable national resources for Japan. They are important energy and mineral resources that will improve Japan's degree of self-sufficiency if developed for commercial use.

The future vision for the development of marine energy resources is to implement so-called commercialization where companies in the private sector seek entry by making investment decisions as profit-making enterprises. Therefore, the role of the government is to promote and prepare the necessary infrastructure for commercialization, in other words, industrialization. Here, we define industrialization as facilitating the technology, knowledge, and systems required when a company in the private sector decides on business entry. At the commercialization stage, we will also improve systems to provide the necessary support commensurate with business development and under an appropriate division of roles between the public and private sectors.

There are few examples of the development of methane hydrate, seafloor polymetallic sulfides and rare earth muds around the world. Japan is world-class in the development of advanced and basic technologies, but the project is still attended by a high degree of uncertainty and difficulty. Consequently, we will strive to implement the project in an efficient and effective manner by managing each step of the project and putting it through the PDCA cycle¹⁶ at appropriate intervals while keeping a close watch on trends in the external environment including the international situation, supply and demand, and the state of economic society.

In addition to the significance of secured availability, the other significant point of developing domestic energy and resources is to have bargaining power when procuring overseas energy and resources. With this in mind, moving forward with industrialization efforts, including building the technologies and developing an understanding of the available resources, will contribute to economic security.

As a result of the technical demonstrations based on The Second Basic Plan on Ocean Policy and the introduction of the rules for occupation rights based on the amended Port and Harbor Act, the phase of demonstrating the utility of the technology of renewable energy, in particular offshore wind power generation, has been completed by means of public research and development. We have now entered the phase of promoting private sector access to offshore wind power generation on business. With regard to bottom-fixed offshore wind power generation, in particular, several power generation projects led by the private sector have been set in motion.

¹⁶ Set out specific objectives (Plan), carry out measures (Do), accurately understand and evaluate progress (Check), revise initiatives based on the result (Act).

As well as improving profitability for business by aiming for further cost reduction, and inhabiting public burden under feed-in tariff (FITs) system, we will facilitate private-sector business investment and accelerate the development of rules for utilization of sea in view of better predictability for business operators and the harmonization with the fishing industry and other prior users.

c. Strengthening International Competitiveness in the Marine industries

Shipbuilding, ship machinery and other marine industries are vital infrastructure industries to promote the industrial utilization of the sea. These industries are expected to contribute broadly to economic growth at levels ranging from local industry to overseas markets. We will strengthen international competitiveness in this field by pushing ahead with the development of products with high added value using environmental, IoT¹⁷, and other advanced technologies and by using ICT to improve productivity.

Regarding entry into the field of ocean resources development, we will utilize the results of traditional initiatives such as the next-generation technologies for ocean resources exploration under the Strategic Innovation Promotion Program¹⁸ (SIP). We will also maximize use of the public support system to continue to facilitate and support corporations in their efforts to improve technological strength ahead of the anticipated expansion in the oil and gas exploration market.

We support exchanges between companies on the Technology Platform for Ocean Resource Development¹⁹ created under the supervision of the councilors at the Councilors' Meeting for

¹⁷ Internet of Things. Refers to automation based on converting things into data to create new added value by exchanging information with a wide range of things connected to the Internet, for example, cars, home appliances, robots, and facilities.

¹⁸ Cross-ministerial Strategic Innovation Promotion Program. A new program for science, technology and innovation established in fiscal 2014 and spearheaded by the Council for Science, Technology and Innovation, Cabinet Office, as it exercises its headquarters function to accomplish its role in leading science, technology and innovation beyond the framework of government ministries and traditional disciplines.

¹⁹ A framework for enhancing collaboration between marine industries and resource industries. Established at the Councilors' Meeting in fiscal 2016 following a proposal in the Project Team Report on New Marine Industry Promotion and Creation. It is a venue that brings together shipbuilding, ship machinery, maritime transport, engineering and other marine industries and resource development companies to share information about technology, such as the availability of new technologies or the current situation and future outlook for research development projects, with the aim of enhancing

Headquarters for Ocean Policy in June 2017 to find solutions to issues in the marine industries. We will reinforce the think tank function of the Platform by utilizing the knowledge of the National Research and Development Agency in order to promote strategic initiatives raised by the public and private sectors.

d. Expand Industrial Use on the Ocean

To expand economic activities in the ocean areas, it is necessary to use the ocean to open up new fields of industry. The time is also ripe for enlarging ports of call for cruise ships to take advantage of a major business opportunity in the maritime field. Another example is university-launched venture companies taking on overseas markets by working in collaboration with a range of industries to develop low-cost underwater exploratory robots. It is necessary to expand economic activities in the ocean areas and to pioneer new fields of industry by injecting the marine industries with such new vitality. In addition, stimulating the economy on Japan's remote islands is also an important opportunity for the marine industries. New measures to stimulate the economy using marine energy are also expected to materialize.

e. Secure Maritime Transportation

International shipping is important as the foundation for supporting the economy and livelihoods of the people of Japan, a country surrounded by the sea on all sides, and it is necessary to secure stable maritime transportation. Japan's international shipping industry is exposed to fierce competition on every single market around the world, so it is important to reinforce the international competitive strength of the industry.

In light of the current issues concerning coastal shipping, we will take steps after clarifying the future vision to be aimed towards coastal shipping. We will also promote the necessary

the competitive strength of the marine industries and promoting the implementation of advanced ocean resource development. Approximately 200 people participated in the first meeting on June 7, 2017 and the second one on February 2, 2018.

initiatives to maintain and revitalize domestic passenger shipping routes, which are vital infrastructure for transportation in regional communities.

Another important issue are the ports that support the national and regional economies, industries, and livelihoods from the perspective of logistics. We are moving forward with improvements to international bulk strategy ports and other maritime transport hubs, which contribute to stronger competitiveness on international markets.

f. Appropriate Management of Fishery Resources and Turning Fisheries into a Growth Industry

Where fisheries are concerned, we aim to balance the appropriate management of fishery resources with efforts to turn fisheries into a growth industry, to increase the incomes from fisheries, and to establish an employment structure that is balanced in terms of age. Therefore, we are pushing ahead with initiatives in accordance with the Basic Plan for Fisheries (decided by the Cabinet in April 2017). Specifically, we aim to improve the accuracy of resource assessments, to upgrade resource management in Japan, and to promote international resource management. As well as improving the efficiency of the fishing industry and the aquaculture industry, and raising incomes for fishing communities by using the technology, knowledge, and capital of industry to improve their managerial competence, we will also make efforts to boost the competitive strength of fisheries with fishing boats. By revitalizing the production activities of the fishing industry, we are also promoting initiatives to fully demonstrate the multifaceted functions of the fishing industry and fishing communities including the border surveillance function.

(2) Maintain and Protect the Maritime Environment

The ocean is an irreplaceable resource that supports all life on the planet including our own affluent lifestyles. These complex and diverse benefits are supported by the ever-changing ocean environment. The ocean also influences the climate because it interacts with the atmosphere. On the one hand, one of the functions of the ocean is to absorb carbon dioxide, which is one of the causes of climate change, but the ocean is also susceptible to rising sea levels and ocean

acidification associated with climate change. The expansion of socio-economic activities in coastal regions and on the oceans has had an impact not only on the coastal areas but also on the ocean as a whole. Once the ocean environment is damaged by ocean pollution, it is extremely difficult to promote recovery. In light of this, it is necessary to protect the ocean environment.

a. Use International Frameworks such as the Sustainable Development Goals (SDGs)

To protect the irreplaceable ocean environment, we will establish appropriate marine reserves, protect fragile ecosystems, prevent ocean pollution, take steps against marine litter, and respond to climate change under international frameworks such as the SDGs. We will also adopt preventative approaches to contribute to the protection of the marine environment while appropriately reflecting the Japanese way of thinking about marine protection and the sustainable development and use of the ocean based on scientific knowledge.

b. Protecting the Maritime Environment Is the Premise for the Sustainable Enjoyment of the Bounties of the Sea

As an oceanic nation that emerged out of symbiosis with the ocean, Japan has applied human interaction harmonized with the natural ecosystem to shape areas of the ocean with sustainable biodiversity and high productivity since ancient times. These ocean areas are the so-called sato-umi. We will develop initiatives to manage coastal and ocean areas in a comprehensive and integrated manner with the understanding and collaboration of stakeholders from the perspective of protecting and regenerating the ocean environment in coastal areas, responding to natural disasters, and improving convenience for local residents by utilizing the experience of the sato-umi. In enclosed sea areas, we will promote efforts to create an abundant sea to protect the water quality as well as the natural landscapes and the cultural landscapes, and the sustainability of fishery resources.

Seeing that the state of the ocean is in constant flux and that there are many unexplained points even from an academic perspective, we will promote adaptive management using the PDCA

cycle to develop a continuous and accurate understanding of the situation in the ocean and to use these results to verify initiatives, and to select and improve the subsequent steps.

(3) Improve Scientific Knowledge

a. Promote R&D of marine science and technology

Marine science and technology contributes to economic and social development in Japan through marine resource development and renewable energy use; to maintaining the safety and security of the nation through steps to counter intensifying climate disasters and disasters due to earthquakes and tsunami; and to responses to climate change and other global issues. The frontiers of humankind are the deep sea, which is difficult to access, and the Arctic and Antarctic regions, which are important to the global environment. By promoting research and development in these areas and advancing comprehensive understanding of the oceans, the planet, and life, marine science and technology creates intellectual property for humankind, inspires young people to take an interest in science, and plays a part in raising Japan's profile in the international community.

Marine science and technology is regarded as important for the national strategy and we will continue to strengthen initiatives from a long-term perspective in light of the versatility of science and technology.

In doing so, we aim to give back to society the knowledge, technologies, and outcomes that emerge out of research and development in the field of marine science and to promote open innovation²⁰ initiatives.

b. Maintain and Strengthen Ocean Surveys, Observations and Monitoring

MDA initiatives use scientific information about the ocean collected through ocean surveys,

²⁰ Actively engage with knowledge and technologies outside one's organization in place of the conventional principle of self-sufficiency (closed innovation)

observations, monitoring and other activities to understand the situation at sea and to share the information in an appropriate manner. These initiatives are effective for the early detection of threats and risks on the ocean or for implementing a range of ocean policies. In that sense, ocean surveys contribute to overall Comprehensive Maritime Security as outlined in section 2-1.

From this perspective, we perceive the ocean observation networks that Japan has established in the past as valuable assets. As well as maintaining and reinforcing them, we move ahead with the development of technologies to build advanced observation systems and strengthen initiatives to centralize the acquired marine-related information.

To successfully obtain information about the vast ocean, it is vital to coordinate and cooperate internationally and to use space technology in addition to field observations by oceanographic research vessels. Consequently, we aim to build and reinforce international ocean observation structures and to take a leading role in the debate about the international standardization of observation technologies as well as advancing the use of earth observation and communication technologies and strengthening the coordination of ocean and space policy.

In order to overcome depopulation, the declining birthrate, and other issues involving human resources, we aim to strengthen initiatives to develop partially or fully automated ocean surveys, observations, and monitoring including developing technologies for unmanned aerial vehicles, Autonomous Underwater Vehicles (AUV), and offshore transponders or other automated equipment.

c. Link Ocean and Space Policies, Promote R&D Aimed at Realizing Society 5.0

In addition to ships, the effective use of satellites is both beneficial and significant in order to enhance scientific knowledge of the ocean. It is also extremely important to have a proper understanding of the situation on the oceans when advancing ocean policy. Collecting marine-related information from satellites is an effective measure when building MDA capacity. From this perspective, it is necessary to continue to use satellite information on the oceans in order to understand the situation around ship navigation and ocean observation and to use space to enhance the scientific knowledge of vast areas of ocean.

The 5th Science and Technology Basic Plan (decided by the Cabinet in January 2016) strongly

advocates innovation creation in science and technology as well as the use of big data analysis techniques, network technologies, and artificial intelligence (AI²¹) to realize Society 5.0.²² To make effective use of the vast amount of marine-related information collected by surveys and observation, it is essential to have technologies that aggregate, analyze, and estimate the huge amount of data and information. Therefore, to move toward the implementation of Society 5.0, we promote research and development involving the organization and use of marine-related big data as well as predictions for changes in the climate and the ocean.

(4) Promoting Arctic Policy

The impact of changes in the Arctic environment are not immaterial to Japan as our geographical position makes us susceptible to the impact of climate change in the Arctic. Since Japan is also the closest country to the Arctic Sea in the Asian region, we can benefit greatly from resource development, the Arctic Sea Route, and other economic and commercial opportunities. In October 2015, Japan's Arctic Policy was formulated, which is Japan's basic policy, at the Headquarters for Ocean Policy with the aim of responding to the issues in the Arctic and contributing to the international community as a major player. In addition to that, Japanese companies have participated in the Yamal LNG Project and used the Arctic Sea Route.²³ Responding to this background, based on the Policy, Japan fully recognizes the importance of the Arctic to Japan and will focus on promotion of research and development, international cooperation as well as sustainable use in the Arctic, while taking account of enhancement of our presence by resolving global challenges through promotion of observation and research, active participation in the formulation of international rules and the promotion of international cooperation which contributes to Japan's interest. In doing so, we recognize the potential of the Arctic and its vulnerability to climate change, and we respect the resilience of the traditional

²¹ Artificial Intelligence

²² Society 5.0 was proposed in the 5th Science and Technology Basic Plan as a future society that Japan should aspire to. It follows the hunting society (Society 1.0), agricultural society (Society 2.0), industrial society (Society 3.0), and information society (Society 4.0).

²³ Yamal LNG constructed the LNG plant in the Russia's Yamal Peninsula and started its operation. The LNG in the Yamal Peninsula has been sold and transported to Europe and Asia through the Northern Sea Route.

socioeconomic infrastructure of the indigenous people in the Arctic.

As well as being an active contributor to international cooperation in science and technology, Japan has carried out observations and research and development regarding changes in the Arctic environment over many years. In fiscal 2018, we plan to carry out maintenance in cooperation with the Norwegian government at the Ny-Ålesund Research Station in Norway, a part of the National Institute of Polar Research, to finalize the framework for further international collaborative research. Science and technology is Japan's greatest strength where leadership on Arctic policy is concerned. It is an extremely important tool when participating in the formulation of international rules and promoting international cooperation. Given a situation where other countries are engaged more proactively in the Arctic, it is with a sense of urgency that we plan to further strengthen frameworks for observation, research, sharing research outcomes, and international coordination, to contribute to resolve global issues and then enhance Japan's presence in the international community.

It is also important to ensure the rule of law, where relevant international law such as the United Nations Convention on the Law of the Sea is observed, to the oceans, which include the Arctic Ocean, and to engage in scientific evidence-based discussions. Building upon such efforts, we will realize the interests of Japan and the international community in the formulation of international rules regarding the conservation and management of fishery resources in the high seas and the improvement of environment for the use of the Arctic Sea Route.

In addition, the impact of environmental change in the Arctic pose challenges for the international community, regardless of whether or not they are Arctic states. Bilateral and multilateral international cooperation is indispensable in order to respond to the challenges. Environmental change in the Arctic could have impacts on not only around Japan but also the international community. While making use of the Arctic Policy which is based on international collaboration, we will build cooperative relations on various diplomatic occasions and create an international environment that contributes to Japan's interests.

(5) International Collaboration and International Cooperation

International collaboration and international cooperation are essential to the national interests

of Japan, which are based on peace and stability in the international community. Since Japan advocates the principle of international cooperation, we must take the lead on the formulation of international rules in the maritime field.

International rules in the maritime field are centered on the UN Convention on the Law of the Sea, which is the accumulation of practices and discussions between many countries over a long period of time. As well as respecting these rules and benefiting from the rights with regard to the ocean stipulated in the rules, Japan also promotes coordination and cooperation together with all countries, including those along the sea lines of communication, to maintain and strengthen the free and open maritime order based on the rule of law. We also play a leading role in shaping and establishing international recognition that such order is essential for the peace and prosperity of the whole international community.

In particular, where disputes and conflicts of interest on the ocean are concerned, we resolve the situation peacefully without the use of force or intimidation and make our point in accordance with international rules from the perspective of forming and developing the maritime order.

In addition to complying with international rules, it is essential to have a better understanding of various ocean phenomena and to properly understand the situation on the ocean to solve regional and global issues involving the ocean. In addition to bilateral efforts, Japan contributes to building a comprehensive ocean monitoring network under the Intergovernmental Oceanographic Commission of UNESCO (UNESCO/IOC²⁴) and other multilateral international frameworks. We endeavor to obtain scientific knowledge through these observations. As long as it is possible to obtain scientific knowledge, we develop policies rooted in science to deal with issues on the ocean. In light of the declaration of the UN Decade of Ocean Science for Sustainable Development (2021–2030), we will participate in formulating and implementing the action plan for the decade, and as a nation, we will contribute to the achievement of the SDGs.

Japan will work to instill the principles of the Rule of Law at Sea and Policies based on Scientific Knowledge as the universal standard not only for Japan, but for the international

²⁴ Intergovernmental Oceanographic Commission of United Nations Educational, Scientific and Cultural Organization. Established in 1960 with the purpose of promoting international cooperation and coordinating research and capacity-building in order to learn more about the nature and resources of the ocean and coastal areas and to apply that knowledge for policies of management, sustainable development, and the protection of the marine environment of its Member States.

community as a whole, and to realize the national interests of Japan through these efforts.

(6) Develop Human Resources and Promote Nationals' Understanding

It is important to cultivate human resources with knowledge of the ocean, who are fundamental to realizing the maritime nation and passing on the bounties of the ocean to future generations.

a. Educate Children and Young People About the Ocean

The cultivation of human resources with knowledge of the ocean starts with the recognition of the importance of the marine-related industries while developing a familiarity with the sea through marine-related education, including experiential activities, and by deepening understanding of the relationship between the sea and Japan's history, scientific understanding of the climate, and understanding of the national territory and industry from early childhood to the primary and secondary education stages in elementary school, junior high school, and high school (below, high school).

Therefore, we will continue to promote marine-related education in schools based on improved guidance on marine-related education in the curricula for elementary, junior high, and high schools.

b. Train and Secure Specialist HR to Support the Maritime Nation

When choosing the high school, technical college, or university where they want to continue their studies, many young people focus on career paths after graduation. Therefore, in order to secure excellent human resources, it is necessary to define the attractive careers available to young people who enter a marine-related high school, technical college, or university with the goal of training to become human resources with a knowledge of the ocean.

The marine industries have spread all over the world. Since it is necessary to use technologies and human resources from all over the world to stimulate these industries, we will simultaneously promote research and development, education, and human resources training from a medium to

long-term perspective while aiming to accumulate technology and business information through international networks. It is also necessary to cultivate human resources with a knowledge of the ocean and to promote initiatives in conjunction with efforts to stimulate the marine industries which are on the receiving end. For industries developing ocean resources, it is an urgent matter to train engineers and other human resources who can work internationally, bearing in mind that the work is carried out in global surroundings in every part of the world. As well as training human resources with a humanities background who are able to plan, draft, and execute industrial policy, have knowledge of international politics, international economy, and international law, have specialist knowledge of contracts and negotiations, and are confident about industrial investments to power the marine industries, we will educate and secure human resources who are able to handle IoT and big data in the maritime field and to realize the productivity revolution and full or partial automation in the marine industries.

In addition, we will facilitate changes in the way of thinking about active roles for women, introduce improved facilities and equipment, and create good working conditions for young people who aspire to the marine industries. This is the key to developing a sustainable industry.

c. Enhance Understanding of the Ocean Among Nationals

When promoting understanding of the ocean among nationals, it is important to instill students and young people with an image of Japan as an outward-looking oceanic nation where the ocean, that is, the whole world, is the stage of activity. As well as considering more ways to tap into Ocean Day based on the significance of the holiday, we will increase opportunities to actually come into contact with the ocean, including safety considerations, so that people in Japan will feel more familiar with the ocean. It is not only a matter of becoming more familiar with the sea, but we will also systematically disseminate knowledge about Japan's position with regard to the geopolitical perspective and the symbiosis between people and the sea.

Chapter 2. Ocean Measures for Comprehensive and Systematic Implementation by the Government

1. Maritime Security

(1) Secure National Interests in Japan's "Territorial Waters, etc."

a. Improving Japan's Deterrence and Response Capabilities and Maritime Law Enforcement Capabilities

- The Ministry of Defense and the Self-Defense Forces: We are steadily implementing defense force development based on the National Defense Program Guidelines and Mid-Term Defense Program. In particular, we aim to enhance and reinforce the defense posture and architecture on the remote islands by deploying units to the islands including the southwestern islands. (MOD)
- The Japan Coast Guard: We aim to steadily build up the ability to enforce maritime law based on the Policy on the Strengthening of the Coast Guard System. In particular, we are urgently moving forward with improvements to strengthen security provisions in the Senkaku territorial waters. (MLIT)
- The Fisheries Agency: We will establish the Fisheries Enforcement Headquarters with the aim of strengthening the ability to control fisheries under a headquarters structure. We will also strengthen coordination between the JCG and the Fisheries Agency to improve the ability to respond to illegal operations by foreign fishing boats. (MAFF)
- We will automate the means of rapid information transmission to ships navigating or working in the seas near Japan in case of ballistic missile launches. (MAFF, MLIT)
- To maintain and improve the ability to deal with suspicious boats and spy boats, we will strengthen the systems for collecting and analyzing information and regularly conduct drills on responses to suspicious boats. We will also strengthen coordination with the Ministry of Defense/JSDF and the JCG to facilitate seamless responses to suspicious circumstances. (MLIT, MOD)
- To preemptively prevent marine crimes, continue to implement surveillance and crackdown.

In particular, implement surveillance and crackdown against illegal domestic poaching, illegal operations by foreign fishing boats, and marine environment crimes, such as disposal of waste in marine zones, the smuggling of drugs, guns and other items and illegal immigration, and the cases of invading the territorial waters and illegal landing by foreign activists. In order to respond appropriately to these situations, we are improving means of transport, securing the necessary personnel and structures, and other materials and equipment. We are also improving JCG patrol boats and aircraft, boats under the control of the Fisheries Agency, and police boats and aircraft. We are strengthening coordination between the JCG and the Fisheries Agency, and between stakeholder organizations with regard to maritime crime control. (NPA, MOJ, MOF, MAFF, MLIT)

- With regard to the increase in maritime research by foreign research vessels without the consent of Japan, we will take appropriate measures such as making protests via diplomatic channels, and requests by JCG patrol boats in the area of the ocean concerned to discontinue the activities. (MOFA, MLIT)
- We are putting more effort into building collaborative frameworks based on seamless and rigorous information sharing with the JCG and the police, improving materials and equipment, increasing the required security maintenance personnel in order to ensure the security of Japan's coastline and remote islands as well as appropriate caution and monitoring of boats drifting ashore or drifting in the sea. As well as appropriate quarantine responses in the context of the fear of the spread of infectious diseases brought by people drifting ashore in Japan, we will also ensure rapid information-sharing structures among stakeholders by strengthening coordination with local governments and stakeholder organizations. In addition, we will seamlessly process wooden boats that have presumably drifted ashore from North Korea. (NPA, MOF, MHLW, MLIT, MOE)
- As countermeasures against terrorism on the seas, under the coordination of related agencies, we will collect and analyze information about terrorism, confirm the safety of ships entering Japan, take countermeasures against terrorism at the border, and appropriately implement monitoring and surveillance of facilities that handle hazardous materials, such as nuclear power plants in coastal regions and petrochemical complexes, and important facilities such as U.S. military facilities. In particular, we are improving systems that facilitate appropriate

responses to unexpected situations such as preventing terror attacks or criminal acts at sea when Japan hosts the Tokyo 2020 Olympic and Paralympic Games. (NPA, MOJ, MOF, MLIT)

- We are steadily implementing security measures at international port facilities and for ships engaged on international voyages based on international and domestic law. (MLIT)

b. Securing Sovereignty and Maritime Interests through Diplomatic Initiatives

- We will strengthen diplomatic initiatives to prevent the emergence of threats. We have been lodging protests promptly through diplomatic channels in case of the occurrence of emergency situations which threatens the sovereignty and maritime interest of Japan such as intrusions into territorial waters by official Chinese boats in the area of the ocean near the Senkaku Islands, maritime research activities by the Chinese and others in the EEZ without the consent of Japan or the launch of ballistic missiles by North Korea. (MOFA)
- With regard to Japan's sovereignty, aiming for diplomatic resolutions, we will continue to tackle the issues of the Northern Territories, which are occupied by Russia without any legal grounds, and of Takeshima, where the illegal occupation by the Republic of Korea is ongoing. (MOFA)
- To prevent unexpected situations and to stabilize the security environment in the seas around Japan, we will set up multiple channels for dialogue, consultation, and cooperation regarding maritime security and in the coastal nations. (MOFA)
- Pending delimitations of the EEZ and the continental shelf with neighboring countries, we are doubling diplomatic efforts to ensure that the legal standing and marine interests of Japan including appropriate management of resources are not harmed in the areas, specified by bilateral fisheries agreements with China and ROK, e.g. so-called area with provisional measures, where one Contracting Party shall not take measures including those for enforcement against citizens and fishing vessels of the other Contracting Party. (MOFA, MAFF)

c. Strengthen Collaboration with Allied and Friendly Nations

- With regard to the United States, our allied country, we will endeavor to further strengthen Japan-U.S. cooperation in the area of broader maritime security through regular exchanges, information-sharing, and exercises. We will also strengthen cooperation with friendly nations and secure a long-term and stable U.S. military presence. (MOFA, MOD)

d. Building Systems for Collecting, Analyzing and Sharing Information

- Enhancing the ocean surveillance systems, we promote research and introduction of partially and fully automated equipment and efforts to gather information from satellites. (CAS, MLIT, MOD)
- In addition to the efficient operation and steady enhancement in vessels, patrol boats, surveillance ships, aircraft, information-gathering satellites, and coastal radar mainly owned by the Ministry of Defense, the Self-Defense Forces, the Japan Coast Guard and the Cabinet Secretariat (the Cabinet Intelligence and Research Office), we are considering the use of Japan Aerospace eXploration Agency (JAXA²⁵) satellites including the Advanced Land Observing Satellite (ALOS-3²⁶), the advanced radar satellite (ALOS-4), and the Super Low Altitude Test Satellite (SLATS²⁷), as well as private-sector small satellites (optical satellites, SAR²⁸ satellites) and promoting collaboration with allied and friendly nations. We will also strengthen systems for information-gathering and ocean monitoring in Japan's "Territorial Waters, etc." (CAS, CAO, MOFA, MOF, MEXT, MLIT, MOD)
- From the strategic viewpoint of securing the maritime interests in the seas around Japan, including Japan's EEZ and continental shelf, we will endeavor to examine and collect necessary information including matters necessary to comprehensively manage Japan's marine area as well as matters that contribute to negotiations involving border delimitation. (CAO, MOFA, MLIT)

²⁵ Japan Aerospace eXploration Agency

²⁶ Advanced Land Observing Satellite

²⁷ Super Low Altitude Test Satellite

²⁸ Synthetic Aperture Rader

- Concerning systems for information-gathering and ocean monitoring, we will promote improvements in the systems for sharing information between the MOD/SDF and the JCG, and we will upgrade the information-sharing systems between the two entities. (MLIT, MOD)
- We will prioritize reinforcement of the JCG ocean monitoring systems based on the Policy on the Strengthening of the Coast Guard System from the perspective of responding to the increase in risk and threat. (MLIT)
- We will strengthen surveillance and monitoring and vigilance at important remote islands and their surrounding ocean areas (MLIT, MOD)

e. Secure the Safety of Maritime Traffic

- We will tackle measures to respond to accidents and disasters, and maritime safety measures such as securing the safety of shipping traffic by preparing, maintaining, and operating aids to navigation and publicizing safety information for navigation, rescue operations in case of accidents or disasters, building security management systems by continually evaluating safety management at shipping companies, steadily carrying out ship inspections and inspections of foreign-registered ships (PSC²⁹), and improving the appropriate structures and systems to prevent accidents at sea, secure navigation safety, and improve safety on ships. We will also promote measures to prevent accidents at sea, improve awareness of accident prevention including safety training, in close cooperation with NGOs and administrative agencies. (MLIT)
- We will monitor the weather condition including ocean winds and dense fog, and the condition on the water including waves and sea surface temperatures to contribute to the safety of ships and maritime traffic. We aim to maintain and improve systems, facilities and equipment for timely and accurate broadcasts of observations, or information about forecasts, and warning. (MLIT)
- To prevent occurrence of large-scale marine accidents that greatly impact society, provide information necessary for safe navigation of ships by vessel traffic service centers and other organizations, give instruction to ships, and take other necessary actions. To ensure that these

²⁹ Port State Control

actions are appropriately and effectively implemented, seek to improve the functions of the service centers. In addition, we will take every possible measure to enhance and strengthen maritime disaster prevention systems and maritime rescue systems to respond promptly and properly should an accident occur. As well as aiming to cooperate with private-sector organizations, we will strengthen collaboration and undertake consultations and drills with neighboring countries. (MLIT)

- Bearing in mind that it takes a long time to locate victims when mounting rescue operations due to a shipping accident or natural disaster, we are building systems that can locate the position of ships, including small ships where position information is difficult to find. To respond appropriately in such cases, we will establish information-sharing structures with the ministries and agencies concerned. (CAO, MAFF, MLIT, MOD)
- To secure the safety of maritime transport, provide marine-related information through *Kaiyo sokuho* (the Quick Bulletin of Ocean Conditions) via the Internet, and enhance the frameworks to collect and provide information of tidal currents in narrow channels with high ship traffic. (MLIT)
- To improve the safety of vessel traffic that uses electronic navigational charts and nautical publications, examine methods to provide highly convenient navigation safety information by actively participating in development of international standards at the International Hydrographic Organization (IHO³⁰), and take measures to improve information and functions of electronic navigational charts. (MLIT)
- Make trajectory predictions accurately by collecting oceanographic data in the area with low data density, enhancing data management systems, and improving trajectory prediction methods by means such as revision of the prediction models, to promptly and accurately implement search and rescue activities by patrol vessels and aircraft, and activities to control and recover spilled oil in the case of occurrence of maritime accidents, under coordination

³⁰ International Hydrographic Organization. An international organization which carries out technical and scientific work to promote hydrographic technology development, techniques for measuring waterways, and consolidates nautical maps (charts, pilots etc.) to make navigation easier and safer around the world. Established in 1921 as the International Hydrographic Bureau. In 1970, when the international hydrographic treaty took effect, it became the International Hydrographic Organization.

among related ministries. (MLIT)

f. Responses to Disasters Originating in the Ocean

- We will examine the nature of an appropriate control tower function based on past drills to prepare for extreme situations such as tsunami, storm surges, or other large-scale disasters originating in the ocean. In particular, we will prepare systems capable of responding to large-scale natural disasters at the Tokyo 2020 Olympic and Paralympic Games. (CAO, MLIT, MOD)
- Since it is difficult to prevent all natural disasters originating in the ocean, we will continue with routine measurements and surveys to reduce damage, and tackle measures to reduce damage. (CAO, MEXT, MAFF, MLIT)
- We will take the necessary measures and steps to counter natural disasters originating in the ocean from the perspectives of disaster prevention, disaster damage forecasting, damage containment when a disaster occurs, reinforcement of efforts to rescue victims, and disaster recovery. (CAO, MEXT, MAFF, MLIT)
- To reduce damage by tsunami and storm surges as far as possible, we will improve seaside embankments to make them resistant to earthquakes, consolidate sluice gates, and improve coastal protection facilities by introducing automation and remote operation. We will also promote proper maintenance of facilities and improve seaside protection forests. We will develop embankments with a solid construction capable of mitigating damage even in the face of large-scale tsunami. In addition, we will promote erosion control to preserve sandy beaches from the perspective of protecting the national territory. (MAFF, MLIT)
- To protect human life from the largest tsunami and storm surges, we will promote the creation of tsunami disaster prevention areas by designating tsunami disaster hazard zones. The government departments concerned will join forces to construct support systems for prefectures and municipalities. We will also promote the designation of assumed storm surge inundation areas in the three major bays. (MAFF, MLIT)
- To prepare against the increased risk of disasters such as catastrophic surges or rising sea levels, and the increased storm surge deviation expected as a result of climate change, we will

- consider adaptive measures to protect the national territory in coastal areas. (MAFF, MLIT)
- We aim to enhance and strengthen the provision of disaster information and to take measures to earthquake-proof and storm-proof aids to navigation at risk of destruction or damage due to large-scale earthquakes and tsunami. (MLIT)
 - We will earthquake-proof quays and sea walls in ports to secure emergency transportation of goods and materials at the time of a large-scale disaster. (MLIT)
 - As well as strengthening operational frameworks at key locations for wide-area disaster prevention and training based on harbor facility control systems operated by the government at the time of disasters, we will improve the Business Continuity Plan (BCP³¹) and formulate BCP for wide-area ports. We will also promote storm surge measures on waterside land at harbors. (MLIT)
 - We aim to strengthen systems in order to promptly undertake maritime transportation of emergency relief goods. With regard to ships that plays an important role in transport and other activities at the time of a large-scale disaster, develop a system in which ships are used for emergency transport operations and other activities by coordinating with local governments, business operators and other organizations. (MLIT)
 - We will examine disaster responses including tsunami safety measures for ships inside harbors in light of the Great East Japan Earthquake, and we will apply the evacuation recommendations based on the Act of Port Regulations in an effective manner. As well as constructing faster and more reliable information transmission systems, we will conduct reviews based on the implementation of practical training. (MLIT)
 - We will observe the situation with regard to tsunami and storm surges, and broadcast information about the live situation, forecasts, or warnings in a timely and accurate manner. We aim to improve systems, facilities and equipment to improve the information and to collect and transmit information promptly and appropriately. (MLIT)

³¹ Business Continuity Plan. A harbor BCP is a document indicating peacetime management actions (management plan) and specific responses (response plan) implemented after the occurrence of a critical event to facilitate the minimum maintenance of important functions in the harbors concerned even in the case of large earthquakes or other natural disasters, the spread of infectious disease, terror incidents, major accidents, unforeseen changes in the operational harbor environment or other critical events.

(2) Secure Stable use of Japan's Important Sea Lines of Communication

a. Initiatives in Japan's Important Sea lines of communication

- In addition to capacity-building support for coastal states along the Sea Lines of Communication and dispatching personnel to international organizations, we will continue to participate in international cooperation activities such as anti-piracy operation off the coast of Somalia and in the Gulf of Aden, and to build relationships of trust and cooperation with coastal states along the Sea Lines of Communications through other regular exchanges. Across all ministries and agencies, we will cooperate to support improvements to maritime law enforcement capabilities, take available opportunities for port of calls by MSDF ships, dispatch of patrol boats, and for joint training. (MOFA, MLIT, MOD)
- We will continue to implement anti-piracy operation off the coast of Somalia and in the Gulf of Aden in cooperation with the international community. Bearing in mind that Djibouti, where the Japanese anti-piracy operational unit has its facility, is a key position facing the Western Indian Ocean and the Red Sea, we will study measures to further utilize this facility considering past record of its utilization so far. We will coordinate information-gathering with the Combined Maritime Forces (CMF³²) and we will strengthen cooperation with the countries concerned through international collaborative frameworks such as the Contact Group on Piracy off the Coast of Somalia (CGPCS³³), and the Combined Task Force 151 (CTF151³⁴). In addition, we will continue bilateral support and support via international organizations to improve the capability to prosecute and control piracy at sea and enhance the capabilities of maritime safety agencies in Somalia and its neighboring countries. (MOFA, MLIT, MOD)

³² Combined Maritime Forces. Headquartered in Bahrain, the CMF is a multinational naval partnership implementing anti-piracy and other measures.

³³ Contact Group on Piracy off the Coast of Somalia. Created in January 2009 pursuant to UN Security Council Resolution 1851 (adopted in December 2008), the CGPCS is a forum where governments and military, shipping companies, and NGOs among others coordinate anti-piracy initiatives off the coast of Somalia.

³⁴ Combined Task Force 151. A multinational coalition force established in January 2009 to deal with piracy at sea.

- We will actively use the Djibouti Regional Training Centre (DRTC³⁵), built by Japanese support through the International Maritime Organization (IMO³⁶), as a base for improving the maritime law enforcement capabilities in the region. (MOFA)
- As well as effectively enforcing the proper implementation of the Anti-Piracy Act, we will implement the necessary defenses against boarding by the use of armed security guards based on the Act on Special Measures Concerning the Guarding of Japanese Ships in Pirate-Infested Waters (Act No. 75 of 2013). We will also strengthen coordination and cooperation with maritime law enforcement agencies in other countries, and support capacity-building in maritime law enforcement agencies in coastal states along the Sea Lines of Communication. (MOFA, MLIT, MOD)
- By sharing information on piracy and armed robbery against ships through the framework of the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP³⁷), and cooperation with countries concerned in maintenance and management of navigation aids, and development of human resources, Japan will implement measures to combat piracy and secure navigation safety in marine zones, such as the Strait of Malacca and Singapore. In recent years, the number of cases of abduction of crew members in the Sulu Sea and the Celebes Sea is on the increase. To address this issue, Japan will support coastal states by improving their surveillance and maritime law enforcement capability. (MOFA, MLIT)
- We will support improvements to maritime law enforcement capability bearing in mind measures to counter organized crime and illegal fishing in the Pacific Island Countries.

³⁵ Djibouti Regional Training Centre. A training facility constructed with the aid of the IMO Djibouti Code of Conduct (DCoC) Trust Fund, with contributions by Japan and other countries, to support for improvements of maritime safety capacity of Somalia and neighboring countries.

³⁶ International Maritime Organization. Established in 1958, the International Maritime Organization is a specialized agency of the United Nations, which facilitates international cooperation on maritime issues such as shipping safety and security and ocean pollution prevention. (Established as the Inter-Governmental Maritime Consultative Organization. The name was changed in 1982.)

³⁷ The Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia was launched in 2006 to promote and enhance cooperation against piracy and armed robbery against ships in Asia. The Information Sharing Centre (ISC) which was established in Singapore facilitates information-sharing among the contracting countries, disseminates reports based on information, and conducts capacity-building programs in the contracting countries. Since the launch of the ISC, Japan has continuously held the position of the Executive Director.

(MOFA, MLIT)

- In light of the threats and risks in the sea lines of communication that are important to Japan, the ministries and agencies concerned will routinely examine how to secure the safety of Japanese ships navigating the sea lines of communication as well as elements of maritime transportation. (MOFA, MLIT, MOD)

b. Strengthening Systems for Collecting, Integrating, and Sharing Information

- It is extremely difficult for only Japan to comprehensively gather information on the sea lines of communication. Thus, in addition to our own efforts, we will build cooperative frameworks with allied and friendly nations and promote cooperation that contributes to capacity development for gathering information about marine observation in coastal states along the Sea Lines of Communications and collaboration with all other countries. (CAO, MOFA, MLIT, MOD)
- We will examine the appropriate provision of information marine observation to other countries and build appropriate frameworks for the provision of information on marine observation, including security measures in order to actively engage with bilateral and multilateral initiatives while setting priorities. (CAO, MOFA, MLIT, MOD)

c. Capacity Building Assistance

- In collaboration with allied nations, friendly nations, and international organizations, we will promote initiatives to strengthen maritime disciplines including equipment and technology cooperation and capacity building assistance to the coastal states along the Sea Lines of Communications. (MOFA, MLIT, MOD)
- In collaboration with allied and friendly nations, we will promote cooperation contributing to capacity development in the whole ASEAN in accordance with the Vientiane Vision (Japan's Defense Cooperation Initiative with ASEAN), including capacity building assistance, joint training and exercises, defense equipment and technology partnerships. (MOD)
- JCG chairs the Heads of Asian Coast Guard Agencies Meeting as a forum for discussion and collaboration in the Asian region with the aim of improving maritime law enforcement

capability in the coastal states along the Sea Lines of Communications. We are also utilizing the Japan Coast Guard Mobile Corporation Team³⁸ to promote capacity development assistance in collaboration with allied and friendly nations. (MLIT)

- When supporting capacity building of the coastal states along the Sea Lines of Communications, we will properly study and assess the capabilities of the coastal states and the needs of these states in order to put the assistance into shape. We will also clarify which fields need to be strengthened in the countries and organizations concerned before providing support. We, the government as a whole, will pursue more strategic and efficient support. Therefore, we will build frameworks to properly share the current situation of the support undertaken by ministries and agencies concerned. (MOFA, MLIT, MOD)
- When implementing the abovementioned assistance, we will coordinate to avoid unnecessary overlap, and continuously pursue effective and efficient assistance from the standpoint of strengthening collaboration at the practical level with our ally the United States, friendly nations, and other nations involved. (MOFA, MLIT, MOD)

(3) Strengthen the International Maritime Order

a. Strengthen Diplomatic Initiatives Toward Respecting the Rule of Law

- We continue to actively work with related countries and organizations through the use of international frameworks such as the G7, the East Asia Summit (EAS³⁹), the ASEAN Regional Forum (ARF⁴⁰), and the ASEAN Defense Ministers' Meeting (ADMM⁴¹-Plus).

³⁸ Established at the JCG. A dedicated team for supporting capacity development at overseas maritime safety agencies. As well as conducting training and drills for staff of maritime safety agencies in other countries, primarily the Asian countries, the Team aims to effectively implement capacity development support in a manner that is more consistent and continuous, and to build relationships of trust through detailed consultations in response to requests for support.

³⁹ East Asia Summit. Summit meetings have been convened since 2005 with the participation of ten ASEAN member states, Japan, China, Korea, Australia, New Zealand, India, the United States and Russia.

⁴⁰ ASEAN Regional Forum. Convened since 1994, the purpose of the Forum is to improve the security environment in the Asia-Pacific region through dialogue and cooperation on political and security issues.

⁴¹ ASEAN Defense Ministers' Meeting. Cabinet-level meeting by the defense ministers of the ASEAN member states convened since 2006. At the 4th ADMM in 2010, Japan was the among eight non-ASEAN states (Australia, China, India, Japan, New Zealand, Korea, Russia, and the United States) admitted as "the plus country" to create the ADMM-Plus. The

(MOFA, MOD)

- We will continue efforts to secure senior posts, including top posts in marine-related international organizations, and to increase Japanese staff with the objective of active participation in formulating the international maritime order as of the early stages. (MOFA, MLIT)

- We will contribute to human resource development and strengthen collaboration with lawyers in other countries through the international conferences and international law moot court competitors hosted by Japan to effectively develop Japan's claims based on international law. (MOFA)

- By promoting exchanges and fostering mutual understanding at maritime safety agencies in Asia, we will support capacity development for staff at maritime safety agencies in Asian countries through the Maritime Safety and Security Policy Program, which aims to coordinate, cooperate, and share awareness with all countries to ensure safety on the oceans. (MLIT)

b. Strengthen Strategic Information Dissemination

- We will strengthen public relations efforts in an effective and strategic manner in close coordination among the ministries and agencies concerned to send out united messages from the government regarding Japan's policies for maritime security. (MOFA)

- We will actively send out the message that international harbors should be in conformity with international standards such as ensuring open, transparent, and non-exclusive operations. (MOFA)

- Concerning the issue of the name the "Sea of Japan", we will continue diplomatic efforts, including public relations, in order to spread correct understanding and gain broader support for Japan's position as the premise of security including on Japan's "Territorial Waters, etc." (MOFA)

first meeting of the ADMM-Plus was convened in October 2010. The ADMM-Plus is the only official defense ministers' meeting in the Asia-Pacific region to include Japan.

c. Strengthen Inter-Governmental International Coordination

- To maintain and develop the free and open ocean supported by a maritime order governed by law and rules, we will strengthen the cooperation among defense agencies regarding maritime security through security dialogue about maritime security and defense exchanges at the bilateral and multilateral levels. Maritime safety agencies will promote the sharing of fundamental values by using multilateral frameworks such as the Coast Guard Global Summit (CGGS), which goes beyond regional frameworks. We will also proactively participate in international cooperation to prevent the proliferation of weapons of mass destruction including the Proliferation Security Initiative (PSI⁴²). (NPA, MOFA, MOF, MLIT, MOD)

The following section describes measures that form the foundation which contribute to reinforcement of maritime security outlined in Chapter 1.

2. Promote Industrial Use of the Ocean

(1) Promote Development and Use of Marine Energy and Mineral Resources

a. Methane hydrate

- We will advance technological development to facilitate future commercial production of methane hydrate—significant amounts of which are expected to exist in the seas around Japan—as an important energy resource that will contribute to a stable energy supply for Japan. Aiming to launch commercialization projects led by private-sector corporations during the period from 2023 to 2027, the government will carry out technological development as an

⁴² Proliferation Security Initiative. An initiative to stop the proliferation of weapons of mass destruction, missiles, and related materials, which are a threat to the stability of peace in the international community. It is a joint effort by the participating countries to analyze and implement measures to stop such transfers and transport within the scope of international and national laws.

initiative toward industrialization to establish the technology, knowledge, and systems required in case of commercialization by private-sector companies. (METI)

- Bearing in mind the energy security significance of methane hydrate development and considering the changes in the external environment, we will endeavor to accumulate and maintain results and to promote continuous development toward industrialization. In doing so, we will clarify technology issues, methodology, and schedules, and other specific development plans as well as the long-term outlook by revising the Plan for the Development of Marine Energy and Mineral Resources, which is formulated on the basis of the Basic Plan on Ocean Policy. (METI)

① Methane Hydrate in Sandy Layers

- Methane hydrate: Based on appropriate evaluation of past research outcomes, we will develop production systems at several boreholes to examine the potential for commercialization, develop an understanding of the volume of resources to secure economic potential, and establish production technologies to deliver long-term and stable production. In doing so, we will endeavor to disclose information about government research and technology, and we will build systems capable of incorporating the outstanding knowledge in the private sector to the fullest extent from the perspective of open innovation. We will also establish a PDCA cycle for project management by classifying the research stages and clarifying the conditions for moving to the next stage. (METI)

② Shallow Methane Hydrate

- Shallow methane hydrate: As well as providing opportunities for a broad range of technologies, we will continue to research recovery and production technologies. In case a promising technique is found, we will narrow the research target and promote technological development toward commercialization. (METI)
- We will carry out maritime surveys to clarify the distribution of shallow methane hydrate in the seabed and the characteristics of its morphology. (METI)

b. Oil and natural gas

- To advance exploration activities in the waters around Japan, we will expedite government-led exploration (roughly 50,000 km²/ 10 years) using 3D seismic survey ships as of fiscal 2019. At the same time, we will introduce world-class instruments and technologies in order to increase competitiveness on the market and to conduct exploration in a more effective and efficient manner while allowing private-sector companies to use the same ships for exploration. We will carry out studies to increase opportunities for exploratory drilling of promising structures. (METI)

c. Marine Resources

① Seafloor Polymetallic Sulfides

- While keeping an eye on the international situation, we will evaluate the mineral resources, develop production technologies, develop environmental impact assessment method, evaluate the economic viability and examine the legal framework with a view to launching a project aiming for commercialization with the participation of private-sector companies as of the latter half of the decade starting in 2018 and beyond. (METI)
- Regarding the mineral resources, it needs to identify the amount of 50 million tons' level at which private businesses can make entry decisions. Under the SIP Next-generation technology for ocean resources exploration, new technologies that can be applied to mineral deposits that are difficult to find with the current exploration techniques, such as concealed deposits in the vicinity of active seafloor polymetallic sulfides are developing. Including using such new technologies, mineral resources estimation will be conducted in cooperation with the private sector. (CAO, METI)
- Where production technologies are concerned, past initiatives have clearly revealed difficulties which differ from mining ventures on land due to the characteristics of the deep sea at every stage from excavating, ore-lifting, ore dressing, and smelting. To overcome these difficulties, we are working to resolve the technical challenges while imagining the future commercialization systems. Regarding the outlook for future trials in the excavating and ore-lifting fields, we will set specific goals for solving the technical problems challenges while

clarifying and revising the Plan for the Development of Marine Energy and Mineral Resources. (METI)

- Regarding environmental impact assessments and other necessary legal frameworks that are necessary when private-sector companies make decisions about commercialization, we will contribute to the formulation of international rules in cooperation with stakeholder agencies while taking into account the outcomes of the SIP Next-Generation Technology for Marine Resources Exploration from the perspective of ensuring consistency with international rules. (CAO, METI)
- Regarding initiatives as of fiscal 2018, we will revise and clarify the Plan for the Development of Marine Energy and Mineral Resources and undertake comprehensive review and evaluation while considering external factors such as economic viability, market conditions, and the formulation of international rules. (METI)

② Cobalt-rich Manganese Crust, Polymetallic Nodule and Rare Earth Muds

- Regarding cobalt-rich manganese crust, we narrow down the exploration areas up to the deadline stipulated in the contract with International Seabed Authority (ISA⁴³). Regarding polymetallic nodules, we carry out surveys in accordance with the contract with the ISA. As well as examining the elements of mining and ore-lifting, we also examine conceptual designs for mining and ore-lifting systems. (METI)
- Regarding the rare earth mud which are found in the sea near Minami-Torishima, bearing future development in mind, we will firstly survey and analyze the existing amount under the collaborative framework between government agencies in the SIP Innovative Technology for Exploration of Deep Sea Resources program. We will also develop and demonstrate production technologies and marine resource survey technologies for use at depths of more than 2000 meters, which can be broadly used for marine mineral resources.⁴⁵ (CAO, MEXT,

⁴³ International Seabed Authority. Organizes and manages seabed activities in accordance with the United Nations Convention on the Law of the Sea and the provisions of the implementing agreement of Part XI of the Convention. The UN Convention on the Law of the Sea designates the deep seabed (the seabed and its subsoil outside the continental shelf of coastal nations and beyond the limits of national jurisdiction of any country) as the common heritage of humankind and aims to manage mining resources in the deep seabed.

METI, MLIT)

- Regarding initiatives as of fiscal 2018, we will revise and clarify the Plan for the Development of Marine Energy and Mineral Resources and undertake comprehensive review and evaluation while considering external factors such as economic viability, market conditions, and the formulation of international rules. (METI)
- Under the SIP Innovative Technology for Exploration of Deep Sea Resources program, we will also develop and demonstrate production technologies and marine resource survey technologies for use at depths of more than 2000 meters, which can be broadly used for marine mineral resources.⁴⁵ (CAO, MEXT, METI, MLIT)

d. Renewable energy derived from the ocean

① Offshore wind power generation

- Further introduction of offshore wind power is indispensable for Japan where appropriate places in which onshore wind power can be introduced are limited. In order to promote utilization of sea areas to develop offshore wind power generation in general common sea areas, we will establish a framework for coordination with relevant parties, and from the viewpoint of reducing business risks by improving the predictability of business operators, develop a regulatory framework to enable occupation of sea areas for a long period of time, and make efforts for smooth implementation of the regulatory framework. Therefore, we will continue to promote appropriate initiatives such as the Bill for the Act of promoting utilization of Sea Areas in Development of Power Generation Facilities Using Maritime Renewable Energy Resources, which was approved by the Cabinet and submitted to the Diet in March 2018. We will also improve the environment required to secure project support structures and overcome power grid constraints from the point of view of seamless construction, maintenance, management, and operation of offshore wind power generation projects.

(CAO, METI, MLIT)

- Aiming to realize the long-term energy supply and demand outlook, we will expand the introduction of offshore wind power while reducing power generation cost to achieve both maximum introduction of offshore wind power and inhibition of public burden.

(METI, MLIT, MOE)

- In order to expand the introduction of offshore wind power in Japan and reduce power generation costs, we will provide wind conditions surveys and design support to business operators that are developing offshore wind farms in general common sea areas and large-scale port areas, and compile data on power generation costs. We also determine construction techniques using dedicated ships. As well as carrying out experimental studies on construction technologies suited to the sea floor topography and the seabed in Japanese waters and experimental studies on lightweight floating wind turbines for floating offshore wind turbine systems, we are also working on developing low-cost construction designs and maintenance.

(METI, MLIT, MOE)

- To implement seamless introduction of environmental impact assessments, we aim to collect and categorize the required environmental information and to further expand the environmental information database already in operation. To streamline the introduction of offshore wind power generation, we will continue to provide information on the potential for introducing renewable energy. (MOE)
- As well as deepening and enhancing the standards of construction, maintenance, and technology for offshore wind power generation facilities, we will promote seamless inspections in cooperation with the private sector to assist business by rationalizing inspection procedures for offshore wind power generation facilities in port areas. (METI, MLIT)
- We will provide information to facilitate seamless coordination with fisheries when regulating the use of maritime areas intended for offshore wind power generation projects. (MAFF)

② Wave Power, Tidal Power, Ocean Current Power and Other Marine Energy

- Based on past research and development outcomes, we will continue to develop technologies to improve economic efficiency and reliability. We will also address demonstration research and improvement of the business environment while identifying technologies with good prospects for practical implementation. (METI, MOE)
- We will coordinate with the policy for promoting remote islands while working on demonstration research to verify cost data, performance and reliability of long-term

continuous operation on remote islands where the cost of supplying energy is high. (CAO, METI, MOE)

(2) Promote Marine Industries and Strengthen Their International Competitiveness

a. Strengthen the International Competitiveness of the Marine Industries

① Add Value to Services, Improve Productivity, and Convert the Industrial Structure

- We are strong backers of the maritime productivity revolution comprised of i-Shipping⁴⁴, which aims to optimize shipping and expand shipbuilding exports, and j-Ocean⁴⁵, which contributes to securing resources and aims to capture the market for marine development. (MLIT)
- Where i-Shipping is concerned, we aim to incorporate automated technologies and IoT in ship design and construction and to improve productivity in the shipbuilding industry as well as to promote the development of ships utilizing IoT, LNG-fueled ships, and other sophisticated ships. We are also pushing forward with initiatives to deliver automated ships. (MLIT)
- Where j-Ocean is concerned, we support the development of high value-added products commensurate with user needs and we are improving the environment for expanding AUV and other Japanese advanced technologies. We also provide financial support to the maritime development field using policy-based finance tools such as the Japan Overseas Infrastructure Investment Corporation for Transport & Urban Development (JOIN⁴⁶). (MLIT)

⁴⁴ Initiative to improve productivity in the shipbuilding industry, to eliminate wasteful use of fuel, and to aim for zero-fault operation by incorporating information and communication technology (ICT) in all phases from ship development and construction to operation. The initial “i” stands for innovation, information, IoT.

⁴⁵ Initiative for Japan’s maritime industries to capture growth in the marine development market. The initial “j” stands for growth in Japan, joint industry-government-academia collaboration, and exponential market growth as suggested by the hockey stick shape of the letter J.

⁴⁶ Japan Overseas Infrastructure Investment Corporation for Transport & Urban Development. A publicly and privately funded organization established for the purpose of contributing to the sustainable growth of the Japanese economy and

- For Japan's shipbuilding industry to capture the top market share in the global market, we will improve productivity and restructure the domestic industry, among other measures, to reinforce business foundations. We will also accelerate transformation of the industrial structure through collaboration with different industries in order to secure technologies and human resources that can respond to new markets and businesses. To do so, we will support and apply taxation measures based on the Act on Strengthening Industrial Competitiveness (Act No. 98 of 2013) commensurate with business development at each company with regard to collaboration between different industries and moves toward mergers and integration in the domestic shipbuilding industry. Regarding business development beyond national boundaries, including the overseas expansion of Japanese shipbuilders and collaboration with overseas shipbuilders, we will examine future approaches while bearing in mind the role of Japan's shipbuilding industry in expanding exports and revitalizing local economies. (MLIT)
- To strengthen market competitiveness of the Japanese shipbuilding and ship machinery industries, we aim to develop high value-added ships with superior energy efficiencies and less exhaust gas such as NOx and SOx. (MLIT)
- We will strive to formulate the rules at the OECD Council Working Party on Shipbuilding to secure fair conditions for competition and to create a sound shipbuilding market. (MLIT)
- To support the economy, industry and livelihood of the regions and of Japan as a whole from a logistics aspect, we will develop ports into maritime transportation hubs. We will also use Japan's experience, technology, and knowhow of the whole supply chain from upstream (planning and formulation stage) to midstream (maintenance stage) and downstream (management/operational stage) to promote overseas development of high-quality port infrastructure systems by means of public-private partnerships. Since port management is also important from the perspective of securing the safety of sea lines of communication, we will take measures to strengthen systems for project identification to promote involvement in administration by applying the knowhow of port management corporations in Japan. (MLIT)

promoting the entry of Japanese businesses into relevant markets. Utilizes the knowledge, technology, and experience accumulated in Japan to dispatch experts and other assistance, or to provide funding for transport and urban development projects overseas.

- To improve productivity on port construction sites, we will promote the use of 3D data in the whole construction process from surveys to construction, inspection and maintenance. We will also promote the use of ICT⁴⁷ and other new technologies for remote operation of underwater construction machinery and we will move the i-Construction⁴⁸ initiative forward. (MLIT)
- By combining AI with automated technologies while maximizing use of the world's best cargo handling capacity developed by Japan's skilled engineers, we will move forward with the implementation of AI terminals with good working environments and the world's best standard of productivity to dramatically improve overall productivity at container terminals. (MLIT)
- As well as promoting strategic maintenance and upgrades through periodic inspections of port facilities with regard to threats from earthquakes and tsunami or infrastructure deterioration, it is also essential to improve observation technologies to obtain hydrographic information and to develop technologies for port facilities such as reinforcing quays against earthquakes. We are advancing these initiatives through the National Institute for Land and Infrastructure Management (MLIT) and the National Institute of Maritime, Port and Aviation Technology. (MLIT)
- To compensate for the lack of a proven track record at Japanese corporations, we work toward accumulating technological competence using support systems for technology development and the Technology Platform for Marine Resource Development. (MLIT)
- Aiming to develop new markets and new projects for Japan's shipbuilding, marine equipment companies and maritime transport industries, we support initiatives of emerging countries including maritime development, fleet maintenance while making use of the government's Official Development Assistance (ODA), the World Bank, and JOIN. (MOFA, MLIT)

② Strategic Expansion of Industries Developing Marine Resources

⁴⁷ Information and Communication Technology

⁴⁸ Initiatives to improve overall productivity of construction production systems by introducing extensive use of ICT on construction sites.

- As well as establishing the practical level for the Integrated Ocean Resources Exploration System developed under the SIP Next-Generation Technology for Marine Resources Exploration program through demonstrations in unexplored areas of the ocean by fiscal 2018, we will complete the technology transfer to the private sector. After the termination of the SIP Next-Generation Technology for Marine Resources Exploration program, we will promote initiatives to build systems for the private sectors so that the private-sector corporations at the receiving end of the technology transfer, including Japan Oil, Gas and Metals National Corporation (JOGMEC⁴⁹) and new corporate entrants, will be able to accept orders for domestic and overseas resource exploration projects. (CAO)
- As well as steadily promoting research and development of marine mineral resources by the Japan Agency for Marine-Earth Science and Technology (JAMSTEC⁵⁰), including the development of basic technologies for exploring marine mineral resources, the origin of seafloor polymetallic sulfides, and building survey methodologies, we will facilitate the transfer of the outcomes to industrial circles. (MEXT)
- Bearing in mind that the marine industries are far-reaching and comprehensive R&D industries, which include the physical sciences and engineering, we will strengthen research functions at universities and the National Research and Development Agencies to reinforce comprehensive technological capabilities and to effectively advance research and development on a global scale. (MEXT, MLIT)
- We will promote initiatives involving the transfer of technologies to the private sector and joint research and development with the private sector. We will develop sensors, AUV, Remotely Operated Vehicles (ROV⁵¹) and other equipment with the aim of improving survey

⁴⁹ Japan Oil, Gas and Metals National Corporation (JOGMEC). An organization under the jurisdiction of METI, JOGMEC contributes to the development of Japanese industry and the betterment of the life of the nation in collaboration with local governments and corporations. Its mission is to provide Japanese society with a stable and permanent supply of resources and energy. Established in 2004 with the integration of the Japan National Oil Corporation and the Metal Mining Agency of Japan.

⁵⁰ Japan Agency for Marine-Earth Science and Technology. An organization under the jurisdiction of MEXT. Its primary purpose is to contribute to the development of academic research as well as to elevate the standard of maritime science and technology through comprehensive work on basic research and development related to the ocean and academic research on the ocean.

⁵¹ Remotely Operated Vehicle

efficiency and detail in anticipation of international standardization.

- As well as promoting research and development on genetic resources or unknown, useful features of the deep sea, the deep seabed, or other extreme environments, we will also facilitate the provision of deep-sea mud samples obtained by JAMSTEC surveys to the private sector in order to accelerate innovation. (MEXT)
- Since open innovation initiatives across sectors are important to connect the needs of private corporations with the seeds in research and development settings, we will promote interdisciplinary research and development and strengthen coordinator functions, service functions, intellectual property and contract systems. (MEXT)
- With regard to marine resources, we will discuss science and technology cooperation with developing nations from the perspective of using the research and development outcomes on marine resources achieved by the SIP Next-Generation Technology for Marine Resources Exploration program. (CAO)
- We will support collaboration between the marine industries, resource industries and other related industries on the Technology Platform for Marine Resource Development to facilitate access for Japan's marine industries to the global market for marine resource development. In order to enhance strategic initiatives under the same Platform, we will also strengthen think tank functions on the Platform by leveraging the expertise of the National Research and Development Agencies. (CAO, METI, MLIT)

b. Expand Industrial Use of the Ocean

- Formulated in March 2016 at the Meeting of the Council for Tourism Vision to Support the Future of Japan (chaired by the Prime Minister), the New Tourism Strategy to Invigorate the Japanese Economy aims to use existing stock to attract five million cruise passengers to Japan in 2020. As well as improving the reception environment for cruise ships through tangible and intangible initiatives, the aim is to build international cruise hubs through public-private partnerships. We will promote attractive regional development centered on ports in response to the diverse needs of the increasing number of cruise passengers visiting Japan in recent years and we will revitalize the regions by promoting sightseeing and exchanges with local

residents through the Minato Oasis and port cooperative associations. (MLIT)

- We will promote visits to Japan in cooperation and collaboration with stakeholders to increase the number of international visitors to Japan by expanding cruise ship reception to achieve the goal of forty million international visitors in 2020 as stated in the Tourism Nation Promotion Basic Plan (decided by the Cabinet in March 2017). (MLIT)
- To support the industry goal⁵² of increasing the number of people with boat licenses to 100,000 and the boating and yachting population to one million people in around ten years' time, which has been identified as the long-term growth strategy for the marine industries, we will implement a range of initiatives to increase understanding and familiarize people with marine leisure in cooperation and collaboration between industry, academia, and government. (MLIT)
- To increase points of contact for the nation and to grow the market for the marine industries, we will provide information about ocean leisure through boat shows and the C to Sea Project⁵³, expand the opportunities for hands-on experience with a focus on Sea Stations, and create mechanisms for simple enjoyment. (MLIT)
- As well as supporting stronger collaboration between marine industry entrepreneurs and other related businesses, we will strive to promote marine tourism and marine recreation with Sea Stations as the hubs. (MLIT)
- We will promote the use of renewable energy and the marine industries by encouraging industries using regional resources such as deep-ocean water at remote islands. (CAO, METI, MOE)
- We will support regional initiatives to improve the attractiveness of sightseeing areas by using local and attractive ocean-related resources. We will also support extensive initiatives to link such sightseeing areas. (MLIT)
- With regard to Carbon dioxide Capture and Storage (CCS⁵⁴), we will steadily advance separation, transport, storage, monitoring, and other scientific developments as well as

⁵² Goal announced by the Japan Marine Industry Association in February 2016.

⁵³ Initiative to broaden points of contact with the ocean to inform more people, including children and young people, about the fun to be had on the sea and in boats. The letter C has several connotations: Citizen, Children, Culture.

⁵⁴ Carbon dioxide Capture and Storage

verification to reduce costs and to establish the technology under a system where entrepreneurs can seamlessly undertake projects on condition of protecting and managing the maritime environment. (METI, MOE)

- All stakeholder ministries and government agencies strive to secure suitable storage areas in tandem with the development and demonstration of CCS technologies. (METI, MOE)
- All stakeholder ministries and government agencies and entrepreneurs are working to improve mainstream recognition in order to win public acceptance of CCS from the aspects of cost, environmental protection, and safety. (METI, MOE)
- Bearing in mind that CCS under the coastal seabed is an internationally pioneering initiative, we are working on expanding around the world and eyeing the possibility of capturing overseas markets. (METI)
- To promote entry into the marine industries, we will support the creation of venture companies launched by universities or national research and development agencies. (MEXT)

(3) Secure Maritime Transport

a. Ocean-going Shipping

- To secure the international competitiveness of Japan's merchant fleet and stable international maritime transport, we aim to ensure a maritime transportation system centered on Japanese ships and seafarers (promote initiatives to increase the size of Japan's ocean-going fleet 1.2-fold in five years starting from fiscal 2018 and to increase the number of Japanese seafarers 1.5-fold in ten years starting from fiscal 2018) by implementing a tonnage tax. In light of intensifying competition on the international shipping market and the policies for ocean-going shipping in other countries, we will move forward initiatives to equalize international competitive conditions. As the premise for this is a free and fair competitive environment, we will engage in bilateral dialog to rectify regulatory policies in other countries that impede competition. (MLIT)
- To achieve the government's goal of forty million visitors to Japan in 2020, we will promote environmental improvements so that foreign visitors arriving on ocean-going cruise ships can travel comfortably and without stress. (MLIT)

b. Coastal Shipping

- According to the Plan for the Future of Coastal Shipping (announced by MLIT in June 2017), the future vision is centered on stable transportation and improved productivity. Stakeholders will collaborate to advance specific measures from three perspectives: strengthening the business foundation for coastal shipping operators, developing and popularizing advanced ships, and securing and fostering seafarers stably and effectively. Always bearing in mind the status of the indicators for the plan as a whole (increase average total tonnage for coastal cargo shipping from 715 tons in fiscal 2015 to 858 tons in fiscal 2025), we will constantly revise each measure while working to achieve the goals. (MLIT)
- Domestic passenger ships and ferries are indispensable transportation infrastructure for regional communities and to promote Japan as a tourist nation. Maintaining and securing remote island routes are a given, but we will also promote initiatives to improve user convenience and to revitalize the passenger ship business by incorporating the demand for tourism from international visitors to Japan among others (for example, improve on-board Wi-Fi, develop multilingual information signage). (MLIT)
- To ensure stable coastal shipping, we will maintain the cabotage system which is the international practice. (MLIT)

c. Set up Maritime Transportation Hubs

- To maintain and expand key routes with port calls in Japan amid the changing situation around maritime transport and ports such as shipping companies collaborating to restructure key routes and the increasing size of container ships, we will mobilize the three pillar measures of freight collection, freight creation, and enhanced competitive strength. We will also deepen and accelerate the integration of tangible and intangible aspects with the strategic international container port policy based on the closing report of the Strategic International Container Port Policy Promotion Committee (January 2014). (MLIT)
- To build a stable and effective network for maritime transportation of resources and energy,

we will maintain quays to facilitate large-scale ships docking at the international bulk strategy port. We will also promote coordinated transportation by large-scale ships based on business-to-business collaboration. (MLIT)

- With stricter international regulations on emissions from ships, we anticipate an expansion of ships fueled by clean LNG. Since Japan is the world's largest importer of LNG with many existing LNG hubs, we will work in cooperation with Singapore to strategically locate Asian LNG bunkering hubs⁵⁵ at Japanese ports. As a result, we will maintain and expand port calls by container ships and car transporters at Japanese ports and strengthen the international competitiveness of the Japanese economy. (MLIT)
- We will promote the development of international logistics terminals and domestic trade terminals tailored to the characteristics and transportation needs of key industries including the automobile industry, which supports the local economy, industry and employment, and the agriculture, forestry and fisheries industries. (MLIT)
- To promote the creation of the sound material-cycle society, we will advance initiatives to further expand the use of recyclable resources at Recycle Ports (integrated logistics hubs for extended recycling)⁵⁶. (MLIT)
- To secure safe and stable maritime transport, the government is acting in an integrated manner to tackle initiatives to develop, preserve, and manage waterways for development and preservation,⁵⁷ which form the core of Japan's international and domestic maritime transport networks. (MLIT)

(4) Appropriate Management of Fishery Resources and Reforms to Turn Promote the Fishery into Growth Sector

a. Appropriate Management of Fishery Resources

⁵⁵ Supply LNG fuel to ships.

⁵⁶ Ports that function as hubs for reverse logistics networks to make the sound material-cycle-recycling-oriented society reality.

⁵⁷ Shipping routes where development and preservation construction is required to secure traffic in waters other than the river areas stipulated in the River Act (Act No. 167 of 1964) and in port areas administered by port management.

- To promote international resource management and to upgrade domestic resource management at a level comparable to the international standards, we aim to improve the accuracy of resource assessments through the drastic expansion of the underlying resource surveys. To this end, we will use and share maritime data related to fisheries resources collected by relevant ministries and agencies or other organizations. In terms of the independence of resource surveys, we will clarify the role of the Japan Fisheries Research and Education Agency (FRA), which has been commissioned to undertake resource assessments, and we will also strive to ensure the transparency of assessment methods and outcomes. (MEXT, MAFF, MLIT, MOE)
- With regard to major resources or regional resources where the amount and value of catches are abundant and resources where the biomass level is deteriorating, the government will proactively show the direction for resource management and, together with the municipalities concerned, promote the efficient and effective development of management of fishery resources. (MAFF)
- We will progressively introduce resource management targets for each major fishery resource such as the level of biomass as standards to be maintained (target reference points) and the level of biomass as standards set to prevent overfishing (limit reference points). (MAFF)
- Since strengthening the international competitiveness of the offshore fishery is a pressing issue, we will make the best use of the IQ⁵⁸ (Individual Quota) system wherever possible in a manner that corresponds to the resource characteristics and operation of the Japanese fishery. (MAFF)
- With regard to the deep-sea and offshore fisheries, we will review systems to enhance international competitiveness without obstructing productivity improvements due to larger fishing boats while bearing in mind the impact on the existing fishery order by improving quantitative control. (MAFF)
- Regarding the Pacific bluefin tuna, we will work on enhancement of systems and structures aimed at ensuring the rebuilding of the resource. Concerning poaching of Japanese eel and

⁵⁸ Individual Quota. Method of managing total allowable catch by allocating each fisherman or fishing boat a total allowable catch and prohibiting fishing that exceeds the quota.

sea cucumber in coastal areas, we will work closely with the relevant organizations, including the prefectures, the police, the JCG, and logistics partners, as there are corrupt and ingenious cases as well as cases where regional responses are necessary. To ensure compliance with resource management measures, we intend to strengthen controls and to prioritize and optimize controls in collaboration with JCG. (MAFF)

- Aiming for the early resumption of commercial whaling, we are discussing the nature of the International Whaling Commission with stakeholder countries. We are also conducting scientific whaling based on the Act on the Implementation of Cetacean Scientific Research for the Implementation of Commercial Whaling, etc. (Act No. 76 of 2017). We will also continue our efforts to broaden understanding of the Japanese position on this matter. (MAFF)

b. Grow the Commercial Fishing Industry

- As far as possible, we will develop efficient and stable fishery management entities to address issues such as the shift to a sustainable and profitable operational framework and the supply of marine products suited to diversifying consumer needs. Positioned as bodies with responsibility for the future of fishery production, we aim to prioritize management measures to these management entities and to enhance their international competitiveness. (MAFF)
- Even though fishery resources are limited, the parties affiliated with resource management and measures to stabilize revenue will use the resources efficiently in the future, assume authority for fishing industry production (corresponding to ninety percent of the value of Japan's fishing industry production), and achieve a fishery structure capable of supplying marine products suited to diversifying consumer needs in a stable manner. (MAFF)
- We aim to improve fishing industry revenues in each fishing community by at least ten percent over a five-year period by implementing the Hama Plan, which is a specific action plan for strengthening competitiveness, raising incomes, and overcoming inadequacies identified by each region based on the actual situation on the ground. When implementing these actions, it is important to use the PDCA cycle to improve incomes and to provide the fishing communities with feedback on best practices and issues to be addressed. (MAFF)
- It is important for fishermen to cooperate with companies that have the necessary technology,

know-how, capital, and human resources. Therefore, as a nation, we will implement measures to facilitate market entry and collaboration between corporations and fishing communities. We will also continue to examine what measures are needed from the perspective of revitalizing fishing communities. (MAFF)

- The problem of the decline in productivity due to the aging fleet of fishing boats necessitates improved safety and performance. In light of the current situation where the supply capacity of shipbuilders is limited, fishermen’s organizations will present long-term plans to replace fishing boats to systematically move forward with the replacement of aging boats. As a nation, we will also provide the necessary support from the perspective of facilitating such planning and strengthening international competitiveness. (MAFF)
- In collaboration with the relevant ministries and government agencies, we will examine measures designed to develop high-speed communications that facilitate high-speed Internet and high capacity data communication to improve the environment on fishing boats. (MIC, MAFF, MLIT)

c. Reform Distribution Channels and Promote Exports of Marine Products

- At present, an increasing number of initiatives go beyond the framework of existing distribution channels to provide marine products that directly respond to consumer needs. As a nation, we will facilitate innovation in distribution channels by comprehensively examining transactions and distribution of marine products including quality and hygiene controls, use of information and communication technology, and traceability⁵⁹ initiatives. (MAFF)
- To expand the overseas market, stakeholders across the country are joining forces to promote exports of Japanese marine products. To increase the number of facilities with HACCP⁶⁰ certification, we will make efforts to develop an export environment tailored to the regulations and needs of export destinations and regions. including improved processing facilities for

⁵⁹ To understand how food moves through one or several specific stages of production, processing and distribution.

⁶⁰ Hazard Analysis and Critical Control Point. A process management system that continually monitors and records important processes at specific control points to prevent harm. The system analyzes the risk of contamination by metals, microorganisms, or other hazards occurring in food production at every stage of the process from receiving the raw materials to the final product.

marine products, training courses, and on-site training support. (MAFF)

d. Comprehensive Improvements of Fishing Ports, Fishing Grounds, and Fishing Communities

- From the perspective of responding accurately to the infrastructure improvement issues in the Japanese fisheries industry, the efforts to comprehensively promote development of fishing ports, fishing grounds, and fishing communities should focus on four central issues. They are to improve functions at fishing ports to promote exports and strengthen the competitiveness of the fisheries industry; to develop fishing grounds with the aim of improving the production capacity in the sea and creating rich ecosystem; to reinforce the capacity to respond to large-scale natural disasters; to use fishing ports efficiently and activate to fishing communities. (MAFF)

e. Promote Multi-Functionally Including Monitoring of National Border

- We will promote efficient and effective initiatives to increase nationals' understanding of the multiple functions of the fisheries industry and fishing communities aside from the supply of marine products. These functions include monitoring of national borders, conservation of the natural environment, preservation of the lives and properties of the public by the sea rescues, and provision of convalescence, exchanges, and education opportunities. (MAFF)
- With regard to border monitoring, we will strengthen collaboration with private-sector organizations receiving information from fishermen as part of the establishment of the MDA structure, one of measures forming bases for maritime security. (MAFF)

f. Initiatives to Support the Activation of the Fishing Industry and Fishing Communities

- To secure sustainable use of limited fisheries resources, which are the building blocks of the ecosystem, and to promote the sound development of the fishing industry, we will promote surveys, research, and technology development to promptly settle issues such as resource

survey sophistication and increased competitiveness in the fishing and aquaculture industries.

(MAFF)

- We will support tangible and intangible initiatives to create regions where overnight stays in agricultural, mountain, or fishing communities can be implemented as a business model. Opportunities to eat fresh seafood or to create rapport with the ocean, which contribute to education about the ocean and increase understanding of the ocean, will also be put to use as tourism resources. (MAFF)

3. Maintain and Conserve Marine Environment

(1) Conserve Marine Environment

a. Ensure Biodiversity

- We will promote initiatives aimed at the conservation and sustainable use of biodiversity in line with the National Biodiversity Strategy 2012–2020 in order to properly implement international agreements including the SDGs and the Convention on Biological Diversity (CBD⁶¹), as well as the outcome document of the United Nations Conference on Sustainable Development (RIO+20⁶²). (MOFA, MOE)

① Qualitative Improvements to Proper Establishment and Management of Marine Protected Areas

- Based on the Ecologically or Biologically Significant Marine Area (EBSAs) (MOE

⁶¹ Convention on Biological Diversity. The Convention was adopted in 1992 and took effect in 1993. Its objectives are the conservation of biological diversity, the sustainable use of the components of biological diversity, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

⁶² Twenty years after the 1992 UN Conference on Environment and Development in Rio de Janeiro, Brazil, the June 2012 follow-up meeting, also held in Rio de Janeiro, discussed green economy policies, institutional frameworks for sustainable development, and initiatives such as disaster prevention and the future of urban planning. The meeting achieved important outcomes for the advancement of future international initiatives such as the adoption of the *Future We Want* outcome document agreed on the final day, which launched the intergovernmental process for formulating the SDGs.

announcement in April 2016), by considering the ecosystem characteristics as well as the social, economic, and cultural factors of marine zones, the ministries and agencies concerned will work together to move forward with the establishment of marine protected areas with a view to properly conserving and maintaining 10% of the waters within their jurisdiction by 2020. (MAFF, MOE)

- With regard to offshore areas where few marine protected areas have been established, the ministries and agencies concerned will work together to examine the concrete way of the establishment of marine protected areas and utilize the outcomes to achieve the 10% target while considering the development and utilization of the marine industry in the future. (MAFF, MOE)
- As well as moving forward with the establishment of marine protected areas, we will focus on qualitative improvements of management for marine ecosystem conservation in protected areas. We will implement adaptive management based on verifying management outcomes and effectiveness. (MAFF, MOE)
- Marine protected areas contribute to the sustainable use of fishery resources. We will promote the establishment of marine protected areas and improve their management while impressing upon fishermen the need for marine protected areas based on the fundamental recognition that areas of the ocean where fishermen voluntarily manage biodiversity and sustainably use resources can also become successful as protected areas. (MAFF)

② Conservation of Fragile Ecosystems

- Ecosystems formed in coral reefs, seaweed beds, tidal flats, sandy beaches, sandbanks, sand dunes, and mangrove forests are increasingly vulnerable as a result of rising sea temperatures associated with climate change, ocean acidification, and other factors. Since these ecosystems ensure biodiversity and act as important habitats and breeding grounds for living organisms including fishery resources, we will actively work on conservation and regeneration measures while developing an accurate understanding of the factors behind the decline. (MAFF, MLIT, MOE)
- Where coral reefs are concerned, we will implement adaptation measures such as restoring

coral reef ecosystems by reducing human-induced pressures based on the Action Plan to Conserve Coral Reef Ecosystems in Japan 2016–2020 (formulated by MOE in March 2016), and the Emergency Declaration on the Large-Scale Coral Bleaching Event (final report of the conference on emergency countermeasures for large-scale coral bleaching in April 2017). We will also facilitate monitoring to understand the circumstances around the deterioration and use the results to develop adaptation measures. (MAFF, MLIT, MOE)

- With regard to the IUCN Red List of Threatened Species, which is the primary source of information about rare animal and plant conservation, the stakeholder ministries and agencies will work together to advance the revision work while examining Red List integration and target species expansion. (MAFF, MOE)

③ Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction

- Bearing in mind the importance of the conservation and sustainable use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ)⁶³, we will actively participate in discussions at intergovernmental conferences concerned with the drafting of new agreements. (CAO, MOFA, MEXT, MAFF, METI, MOE)

b. Responses to Climate Change and Ocean Acidification

- We will continuously carry out observation and monitoring in the ocean to develop an accurate understanding of how the rise in sea temperatures and ocean acidification influence the marine environment and the marine ecosystem. As well as moving forward initiatives to project and assess climate change and its impact, we will implement adaptation measures in the ocean. (MEXT, MAFF, MLIT, MOE)
- In addition to developing better automated observation technologies to deliver efficient marine observation, we also aim to improve and refine marine observation data and to work

⁶³ Marine Biological Diversity of Areas beyond National Jurisdiction. Under the United Nations Convention on the Law of the Sea, the marine biological diversity in ocean areas beyond national jurisdiction, i.e., international waters and deep sea beds.

toward developing the international standard. (MEXT, MLIT)

- The National Plan for Adaptation to the Impacts of Climate Change aims to assess the impacts of climate change approximately every five years. With this in mind, we will strive to accumulate new knowledge about climate change and its impact and to reflect this knowledge in climate change impact assessments. (MOE)
- We will aggregate information about climate risk, including climate change on the ocean and its impact, to improve the Information Platform on Adaptation to Climate Change, which is the information infrastructure that supports adaptation initiatives by all entities. (MOE)
- Bearing in mind the severe impact on vulnerable ecosystems of rising sea temperatures and ocean acidification, we will implement initiatives to mitigate climate change with a view to achieving the goals of the Paris Agreement. (MOE)
- As initiatives to mitigate the negative impact on the environment through reduction of emissions from ships such as greenhouse gas, SO_x and NO_x, we will take initiative in developing and strengthening international rules on greenhouse gas emissions from ships, and further engage in trial projects on energy efficiency technologies, optimizing navigation by means of IoT, promoting energy conservation in harbors, building carbon-free ports⁶⁴ through measures to expand carbon sinks, promoting the use of LNG-fueled ships and building LNG bunkering hubs. (MLIT)
- We will implement the initiatives to absorb carbon dioxide by using blue carbon, which is the carbon stored in the marine ecosystem. (MLIT)
- We will endeavor to gain widespread nationals' understanding of what causes the environmental problems in the oceans such as ocean acidification and rising sea water temperatures associated with climate change due to the increase in greenhouse gas emissions. (MEXT, MLIT, MOE)
- We will share observation data under international frameworks including the Argo project,⁶⁵

⁶⁴ Ports that promote mechanisms for developing low carbon initiatives across the port as a whole by introducing renewable energy, CO₂ emission controls, and carbon sinks

⁶⁵ An international project that measures salinity and sea temperatures in the upper ocean around the world in near real-time using observation equipment referred to as Argo floats in cooperation with the World Meteorological Organization (WMO), UNESCO/IOC, and other international organizations and related organizations in each country. In Japan, JAMSTEC is the implementing agency promoting the Argo program.

which is an international project for understanding changes in the global oceans. We will also actively support scientific research at, among others, UNESCO/IOC and contribute to building international consensus based on science. (MEXT, MLIT)

c. Responses to Marine Litter

- With regard to marine litter (beach litter, floating litter, litter on the seabed), In order to conserve good landscape and environment, we will comprehensively promote the implementation of understanding of the situation, measurements of recovery and curbing the generation of litter with participation and collaboration of various entities, aiming at reducing maritime litter including microplastics which have been unexpected and hard of substantial recovery. (MOFA, MEXT, MAFF, MLIT, MOE)
- With regard to microplastics and other marine litter, we will continuously survey the impact on marine life and the ecosystem, the distribution of marine litter in the ocean and the situation with toxic substance absorption. (MEXT, MOE)
- We will promote research and development including upgrading methods of monitoring microplastics and other marine litter. (MEXT, MOE)
- We will support local governments and entrepreneurs with recovery and processing of marine litter in keeping with local circumstances. We will also support improvements at the waste processing facilities needed to process the marine litter. (MAFF, MOE)
- We will support urgent processing of driftwood by coastal managers in a disaster scenario. (MAFF, MLIT, MOE)
- We will process and recover floating debris and oil to preserve the marine environment. (MLIT)
- We will understand the facts about waste plastic tanks and other articles washed ashore that come from outside the country to make requests, if necessary, to countries of their origin. (MOFA, MOE)
- Bearing in mind the perspectives of education and lifestyle, the relevant organizations will work together on comprehensive measures including campaigns to raise awareness with regard to river beautification, prevention of littering and other illegal dumping, waste controls

for disposable plastic containers and wrapping (reduce) and resource recovery (recycle) to give an additional boost to controls on marine litter including debris that flows from the land via rivers into the ocean. (MLIT, MOE)

- Based on G7 initiatives, we will contribute to promoting international harmonization of microplastics monitoring techniques to clarify the global scale of the distribution. (MOE)
- We will contribute to understanding the true situation and reducing discharge of marine litter in the Asian region, in particular, through cooperation on human resource development and marine litter surveys and research under international frameworks, (MOE)

d. Prevent Marine Pollution

- Based on the Act on Prevention of Marine Pollution and Maritime Disaster (Act No. 136 of 1970), which is the domestic legislation relevant to the 1996 Protocol to the London Convention, we will operate a licensing system for the disposal of waste into the sea and seabed disposal of specific carbon dioxide gases. We will also carry out appropriate observation and monitoring of compliance with laws and regulations. (MOE)
- We will respond in an appropriate manner to regulations concerning the discharge of oil, noxious liquid substances, or waste matter from ships, secure waste oil treatment facilities, and confirm ballast water processing from the perspective of complying with international agreements such as the International Convention for the Prevention of Pollution from Ships (the MARPOL Convention) (including the amended Protocol) and the International Convention for the Control and Management of Ships' Ballast Water and Sediments. (MLIT, MOE)⁶⁶
- With regard to marine pollution from oil or noxious liquid substances, we will improve control systems for oil spills including information on the coastal water environment to facilitate the effective removal of oil, upgrade oil removal and oil recovery equipment, and conduct training

⁶⁶ International treaty that sets the standards for methods of discharging oil, noxious liquid substances, sewage, waste matter, etc., from ships as well as ship construction and facilities to prevent ocean pollution caused by marine navigation. The MARPOL treaty derives its name from the initial letters of MARINE POLLUTION. The official name is the International Convention for the Prevention of Pollution from Ships.

and drills for stakeholder organizations based on the National Emergency Plan for Preparedness and Response to an Oil, etc. Pollution Incident (decided by the Cabinet in December 2006). To prevent marine pollution caused by oil spills at the time of shipping accidents, we will cooperate with the relevant organizations to recover the spilled oil using large-scale dredging and oil recovery ships. As one of the leading contributors to the International Oil Pollution Compensation Funds, we will continue to actively participate in its sound management. We will also respond accurately to oil pollution accident damage with regard to foreign oceangoing ships entering Japanese ports by responding appropriately to oil discharge from neglected ships. We will also issue written evidence of contracts on insurance and confirm that contracts on insurance have been concluded based on the Act for Oil Pollution Damage (Act No. 95 of 1975). We will also examine the nature of responses to damage caused by maritime transport of hazardous substances and toxins. (MLIT)

e. Radiation Monitoring

- With regard to monitoring for radiation in the ocean, we will continue to monitor the sea water, marine soil, and marine organisms in cooperation with the relevant ministries or agencies and organizations. In particular, where the accident at the TEPCO's Fukushima Daiichi Nuclear Power Station is concerned, we will measure concentrations of radioactive materials in the sea water, marine soil and marine organisms in the sea area near the power station, coastal waters, offshore waters, and the open ocean in cooperation with the relevant organizations and in keeping with the Comprehensive Radiation Monitoring Plan based on the long-term perspective. We will also improve and strengthen monitoring of the routes whereby radioactive materials have flowed from the land via rivers into the ocean to examine how they are spreading. In addition, we will implement the necessary measures based on the monitoring outcomes. (MAFF, MLIT, MOE)

f. Reconciling Marine Development and Use with the Environment

- We will conduct environmental impact assessment in an appropriate manner based on the

Environmental Impact Assessment Act (Act No. 81 of 1997) as it is important to properly evaluate the impact on the environment according to the degree of environmental impact where the development and use of the ocean is concerned. (MOE)

- With regard to the use and development of offshore waters and the deep sea, we will collect the data necessary to assess the impact on the environment while bearing in mind international discussions and initiatives by Japan and the international community. Once the projects have started, we will also consider how to assess the environmental impact including follow-up surveys. (METI, MOE)
- We are moving forward with model projects to examine zoning techniques (initiative to establish conservation areas and areas where renewable energy will be introduced) from the perspective of compatibility between the introduction of offshore wind power generation and environmental conservation. We will examine how to promote the introduction of wind power in the future in collaboration with the relevant ministries and agencies. (MOE)
- With regard to CCS, we will examine the applicability of monitoring technologies for appropriate project implementation and we will also survey the scientific properties of ecosystems, sea water, and bottom sediment in the seas near Japan to properly evaluate the validity of the outcomes of environmental impact assessments and observations undertaken by business operators. (MOE)
- As well as developing sensors and improving observation equipment to enhance measurements of the biochemical data that contribute to environmental impact assessments, we are also contributing to the formation of international rules in cooperation with the relevant organizations based on the results of studying the nature of environmental impact assessments. (MEXT)
- We are moving ahead with the development of offshore waste landfill sites for dredged soil and general-waste, while paying attention to the offshore environment from the perspective of contributing to the orderly development of ports and the proper disposal of waste matter. (MLIT)

(2) Comprehensive Management of Coastal Areas

a. Promote Comprehensive Management of Coastal Areas

- Keeping in mind the connections among forests, the countryside, rivers, and the sea, the water cycles in river basins, and ecosystem management, we are proactively incorporating the sato-umi concept, which involves local people in the necessary problem-solving activities to create better conditions in the oceans to be able to reap the benefits. With a view to broadening council activities, which are expected to play a central role in promoting these initiatives, we aim to shape and examine the nature of the support for local governments and councils in collaboration with the relevant ministries. (CAO, MAFF, MLIT, MOE)

b. Promote Integrated and Comprehensive Management of Land and Maritime Areas

① Promote Comprehensive Sediment Management

- To reduce the impact on the natural environment and the loss of land due to changes in the flow of coastal sands caused by coastal construction and the reduced flow of sediment from land to sea, we will collaborate with the relevant organizations to carry out comprehensive sediment management such as erosion controls to regulate sediment runoff, sedimentation controls in dams, sediment restoration in the downstream reaches from dams, and implementation of sand bypasses and shore reclamation where the coast has been eroded. We will also conduct research and development to understand how sediment moves and to improve prediction techniques. (MLIT)⁶⁷

② Create Accessible and Nature-Friendly Coasts

⁶⁷ When the movement of sand has been disrupted by oceanfront structures causing sediment to accumulate on one side and the sandy beach on the other side to retreat, sandy beaches are restored by transporting and supplying sediment accumulated on one side of the structure to the coastal area on the other side.

- “The basic policy on coastal protection zones to protect the coastline” (May 2000, formulated by then-Minister of Agriculture, Forestry and Fisheries, Transport and Construction in May 2000), which is based on the Coast Act (Act No. 101 of 1956), divides the whole country into seventy-one coastal zones and reflects regional opinion in the formulation of the basic plan for coastal protection. In addition to disaster protection, the plan protects coastal spaces by coordinating initiatives to maintain the environment with local residents’ use of the space through coastal cooperatives. (MAFF, MLIT)
- We will create and protect a favorable coastal environment by promoting improvements to the coastline such as adaptive coastal erosion controls through timely and accurate monitoring. We will also engage with initiatives to use new technology to develop and publicize inspection and monitoring methods of coastal protection facilities using new technology. (MAFF, MLIT)
- Appropriately maintain sites with good natural scenic views as natural parks. (MOE)
- We will promote disaster prevention and disaster risk reduction measures by the proactive use of the natural ecosystem and topography in line with the characteristics of each area. We will assess the functions of coastal forests, including coastal disaster prevention woods, wetlands, sandy beaches, and coral reefs, which act as protectors of the ecosystem in normal times and prevent or mitigate disasters in emergency situations. (MAFF, MLIT, MOE)

③ Proper Management of Nutrients⁶⁸ and Contaminants, Rehabilitate and Improve Circulation

- To reduce the pollutant load flowing down from land areas, construct sewer systems and other wastewater treatment facilities in districts without sewerage and improve combined sewer systems. Advance water purification at irrigation and drainage facilities and rivers. (MLIT, MOE)

⁶⁸ Nitrogen, phosphorus, silicon and other materials necessary to grow and propagate phytoplankton and seaweed. When there is an excess influx of nutritive salts into enclosed coastal seas where there is little exchange of sea water, the water environment deteriorates due to mass propagation of phytoplankton and red tides. In the ensuing decomposition process, dissolved oxygen content in the sediment layer declines.

- As well as improving sewage treatment facilities and introducing sophisticated treatments to improve water quality in maritime areas where reducing nutrients is a necessity, we are also working with the relevant organizations on studying and developing a nutrient circulation system that integrates land and sea areas. In maritime areas where the concentration of nutrients has reached the environmental standards, we are studying detailed water quality management measures and accumulating cases of adaptive initiatives to manage nutrients within the range of environmental reference values while considering the impact on the environment. (MAFF, MLIT, MOE)

c. Promote Coastal Area Management in Enclosed Coastal Seas

- In enclosed coastal seas, we are developing measures such as projects to improve the maritime environment and the Bay Renaissance Projects aimed at protection, regeneration, and the proper management of the effects on the environment. To make a beautiful and bountiful sea reality, we are investigating measures based on scientific knowledge and we are also conducting surveys and research on water quality, rises in sea water temperatures, and changes in biological habitat in addition to the relationship between biodiversity and biological productivity. Regional protagonists are encouraged to discuss the future of the ocean and to cooperate and collaborate on systematic and comprehensive initiatives. (MAFF, MLIT, MOE)
- As well as improving sewage treatment facilities in maritime areas where reducing nutrients is a necessity, we are also capping sediment with sand in ports. (MLIT)
- To control the effect of land-derived nutrients on enclosed coastal seas with poor sea water exchange, we are introducing discharge controls on nitrogen and phosphorus, developing our understanding of the volume of land-derived pollutants, and conducting water quality surveys. (MOE)
- Aiming to conserve and regenerate the maritime environment, we are comprehensively promoting inclusive initiatives such as working with stakeholders to strengthen structures, environment monitoring, and use of information-sharing systems, as well as independent initiatives such as sludge dredging, protection, reuse, and creation of tidal flats or seaweed

beds by making effective use of dredging sand, backfilling deep pits, and expanding port structures that are symbiotic with organisms. (MAFF, MLIT, MOE)

- We are implementing initiatives to meet the reduction targets under the 8th Total Pollutant Load Control⁶⁹ (target year: fiscal 2019) in Tokyo Bay, Ise Bay, and the Seto Inland Sea, which are large enclosed coastal seas. (MOE)
- To further protect and regenerate the Seto Inland Sea environment based on the 2015 amendment to the Act on Special Measures concerning Conservation of the Environment of the Seto Inland Sea (Act No. 110 of 1973) and the changes to the Basic Plan for Conservation of the Environment of the Seto Inland Sea (by Cabinet decision in February 2015), we will combine the conventional Total Pollutant Load Control with conservation and regeneration of seaweed beds and tidal flats, and sludge improvements from the perspective of beautiful and bountiful sea where biodiversity and biological productivity are secured. We also intend to move forward with the necessary studies and measures to encourage comprehensive initiatives in collaboration with local community protagonists. In addition, we will accelerate surveys and research on how the decrease in nutrients and their uneven distribution impact on the fishery resources (stipulated in the supplements to the abovementioned amended law), and we will study measures to ensure beautiful and bountiful sea. (MAFF, MLIT, MOE)
- We will promote regeneration measures in light of the basic policy for rejuvenating Ariake Sea and Yatsushiro Sea based on the Act on Special Measures concerning Rejuvenation of Ariake Sea and Yatsushiro Sea (Act No. 120 of 2002) from the perspective of regeneration in the Ariake Sea and the Yatsushiro Sea. We will also move forward with surveys and accumulate the scientific knowledge necessary to assess the rejuvenation efforts in light of the investigations by The Commission for the Assessment of Comprehensive Research on Ariake Sea and Yatsushiro Sea. (MIC, MEXT, MAFF, METI, MLIT, MOE)

d. Coordination of Activities in Coastal Zones

⁶⁹ Based on the Water Pollution Prevention Act (Act No. 138 of 1970), the Total Pollutant Load Control system reduces total volume of pollutants flowing into maritime areas. It is targeted at large enclosed coastal seas where population and industry converge. Currently, load controls to reduce Chemical Oxygen Demand (COD), nitrogen and phosphorus are implemented in Tokyo Bay, Ise Bay, and the Seto Inland Sea.

- Conduct the process for establishment of sea surface utilization and implement coordination rules in consideration of local actual status in coastal zones. Improve access to information on the utilization coordination rules in different regions and conduct awareness-raising and educational activities for users of coastal zones, including those engaged in marine recreational activities. (MAFF)
- As part of safety and environmental measures for small ships, take actions for decreasing the number of deaths and missing persons in small ship accidents, for eliminating and alleviating environmental issues, for increasing proper utilization and for stimulating related businesses. For accelerating development of the environment for proper use of small ships, take efforts such as construction of umi no eki (marine station) facilities. In addition, conduct actions against abandoned pleasure boats, based on a combination between boosting of the mooring and safekeeping capacity and regulatory actions for proper management of pleasure boats. (MLIT)

4. Strengthening the Capacity for Maritime Domain Awareness (MDA)

(1) Systems for Gathering Information

- In addition to the steady operation and steady enhancement in vessels, patrol boats, surveillance ships, aircraft, information gathering satellites, and coastal radar mainly owned by Ministry of Defense, the SDF, the JCG and the Cabinet Secretariat (Cabinet Intelligence and Research Office), we are considering the use of JAXA satellites including the ALOS-3, ALOS-4, and SLATS as well as private-sector small satellites (optical satellites, SAR satellites). We will also reinforce MDA capacity by strengthening information-gathering systems in collaboration with an ally and friendly nations. (CAS, CAO, MOFA, MOF, MEXT, MLIT, MOD)
- In light of initiatives to increase the number of quasi-zenith satellites, to develop sensor technologies for the ALOS-3 and 4, to move forward with SLATS proof of concept, to increase satellites equipped with receivers for automatic identification systems (AIS⁷⁰), and

⁷⁰ Automatic Identification System. Transmits and receives information on ship position, speed, course as well as safety

initiatives by other countries involving all types of satellites including small satellites, we will research and analyze further utilization of MDA satellite information such as demonstration tests to ascertain the movement of ships more accurately through satellite AIS. (CAO, MEXT)

- Continue to promote use of satellite information in activities such as monitoring of ocean conditions, including sea temperatures, currents and sea ice, provision of fishing ground information to fishermen, observations of greenhouse gases on a global scale including at sea, and projection of climate change. (MEXT, MAFF, MLIT, MOE)
- Continue to develop automatic observation technologies using sensors and AUV to improve the efficiency and detail of marine surveys. We will also study how to use AIS to collect information about ship movements, new methods using ICT for understanding ship movements, and ways of sharing such information in a format that is more user-friendly. (MEXT, MLIT)
- As well as operating existing networks for observing submarine earthquakes and tsunami such as the Seafloor Observation Network for Earthquakes and Tsunamis along the Japan Trench (S-net⁷¹) and the Dense Oceanfloor Network System for Earthquakes and Tsunamis (DONET⁷²), we will also enhance their utilization and application. In addition, we will examine observation and research systems intended to respond to large-scale earthquakes and tsunami expected to occur along the Nankai Trough. (MEXT)
- We will carry out earthquake and tsunami observations in addition to meteorological and hydrological observations using ships, drifting buoys, coastal wave meters, tide gauges, the

information over VHF (very high frequency) radio waves. The system is expected to automate ship position reporting, reduce ship operator workload, prevent congestion, and prevent collisions with other ships.

⁷¹ Seafloor Observation Network for Earthquakes and Tsunamis along the Japan Trench. An extensive and dense network for earthquake and tsunami observation (seismographs, water pressure gauges) extending along the Japan Trench from offshore Hokkaido to offshore Boso. Seafloor cables totaling about 5,700 km in length connect 150 observation points on the seafloor and transmit data to land in real-time. The purpose is to clarify the earthquake and tsunami mechanism and to provide accurate and prompt information about earthquakes and tsunami.

⁷² Dense Oceanfloor Network system for Earthquakes and Tsunamis. An extensive and dense network for earthquake and tsunami observation (seismographs, water pressure gauges) extending from offshore Kii Peninsula (Tonankai earthquake hypocenter) and Cape Shiono to Cape Muroto (Nankai earthquake hypocenter). Seafloor cables totaling about 700 km in length connect 51 observation points on the seafloor and transmit data to land in real-time. The purpose is to clarify the earthquake and tsunami mechanism along the Nankai Trough and to provide accurate and prompt information about earthquakes and tsunami.

Himawari meteorological satellite, and weather radar. (MLIT)

(2) Structures for Information Integrating and Sharing Information

- When aggregating and sharing information about marine observations, we will build organic information-sharing structures which facilitate flexible and rapid information-sharing among the relevant ministries and agencies on the basis of the confidentiality of maritime observations. We will also share information from fishermen and strengthen other collaboration with private-sector organizations. (CAO, MOFA, MAFF, MLIT, MOD)
- We will enhance information-sharing between the Ministry of Defense/SDF and JCG by advancing the development of information-sharing systems between the two parties. We also strive to build the MDA Situational Indication Linkages (MSIL)⁷³ capable of aggregating maritime-related observation from a variety of sources including publicly available information and academic information. When maintaining and operating MSIL, we will strengthen collaboration with all types of marine information services operated by stakeholder organizations, (CAO, MLIT, MOD)
- With regard to marine surveys and other marine information owned by stakeholder organizations, we will maintain information quality and work on data policy integration and standardization from the perspective of user convenience. (CAO)
- With regard to marine information collected and consolidated by the government to develop ocean policy, including information obtained from marine surveys by the national or local governments, we will centralize information management and publication while ensuring appropriate handling in line with the level of information confidentiality. We will also develop ocean policy in an effective manner and promote its application to industrial activities by encouraging information-sharing among the parties concerned. (CAO, MLIT)
- We will advance integration (data assimilation in numerical prediction models, etc.) of observational data obtained from moored or drifting buoys, ships, satellites or various other

⁷³ An information system maintained and operated by JCG for aggregating, sharing, and providing marine information including satellite information.

methods to improve the value of observational data. (MEXT, MLIT)

- As well as using supercomputers and understanding of climate change, ocean acidification, and sea conditions to improve the accuracy of predictions by means of highly precise numerical models, we will also use information visualization techniques to complete the content. To promote the broad application of outcomes, we will disclose information in the Marine Diagnosis Report and elsewhere. (MEXT, MLIT)
- As well as collecting, managing, and providing marine information through the Japan Oceanographic Data Center (JODC⁷⁴) in cooperation with relevant organizations, we will continue to operate and upgrade the Marine Information Clearing House and the Marine Cadastre (Kaiyo Daicho). We will also promote coordination between these initiatives and the MDA Situational Indication Linkages (MSIL). (CAO, MLIT)
- Encourage sharing of marine-related information among agencies including regional levels, such as prefectures, by developing and managing a common platform used for collecting, analyzing and processing marine-related information. Moreover, from a perspective of providing information to a wide segment of the general public, collect and compile a range of documents related to marine science and technology, and improve the convenience for users to access such documents. (CAO, MEXT)

(3) International Collaboration and Cooperation

- We aim to support multilingualism in order to use the MSIL in cooperation with the international community. (CAO, MLIT)
- We will strengthen international coordination and cooperation on MDA by effectively combining bilateral and multilateral initiatives. We will use the marine information obtained through these initiatives to implement various ocean policies in an appropriate manner. (CAO, MOFA, MLIT)
- We will make efforts to receive marine information possessed by other countries or international organizations collect information through various routes. (CAS, CAO, MOFA,

⁷⁴ Japan Oceanographic Data Center. Organization operated by JCG to collect and manage oceanographic data obtained by research organizations in Japan, and to provide the data to partners in Japan and overseas.

MOF, MEXT, MAFF, METI, MLIT, MOE, MOD)

- In addition to our own efforts, we will strengthen our structure of MDA by building cooperative frameworks with allied and friendly nations and promoting coordination with related countries and cooperation of contributing to developing the capacity of MDA of in the coastal nations along sea lines of communication. (CAO, MOFA, MLIT, MOD)

5. Promote Research and Development as to Maritime Research and Marine Science & Technology

(1) Promote Maritime Research

a. Promotion of Comprehensive Marine Surveys

- We will promote strategic initiatives pertaining to maritime research such as strengthening the system of maritime surveys based on the Policy on the Strengthening of the Coast Guard System in order to further enhance information about seafloor topography and resource distribution including information that contributes to delimitation negotiations and information needed to comprehensively manage Japan's area of the ocean from the strategic viewpoint of ensuring marine interests through maritime surveys of the seas around Japan including the Japanese EEZ and continental shelf. (CAO, MOFA, MLIT)
- With regard to ocean monitoring, it is important to observe the ocean comprehensively by fully exploiting advanced observation technologies using satellites and observation buoys as well as to accumulate not only real-time, but also long-term observations. We will improve automated technologies that contribute to efficient observations and the appropriate operation of the oceanographic research ships carrying out marine observations. (MEXT, MLIT)
- We aim to build integrated observation networks that combine observation by drifting floats,⁷⁵ moored systems,⁷⁶ ships, and underwater or seabed probes⁷⁷ to accurately observe

⁷⁵ Argo floats are autonomous drifting buoys that collect information about water temperature and salinity as they repeatedly descend down to depths of 2,000 meters and ascend to the surface to transmit the collected data in quasi real-time.

⁷⁶ Systems with observation equipment for continuous and long-term observation of a fixed point in the ocean. The system is fixed (moored) to the seafloor with one end of a tether line while the other end rises with the buoyancy of the float.

⁷⁷ Systems that are coordinated with AUV, ROV or other platforms for the purpose of underwater or seafloor exploration

oceanographic data at greater ocean depths including biology that are spatially and temporally remote. (MEXT)

- Equip steadily research vessels, manned and unmanned survey systems and other equipment essential for marine surveys, develop new survey equipment, and introduce new technologies. (MEXT, MLIT)
- By participating in international marine observation programs and a framework for marine-related information exchange, implement marine observations, surveys and research, and other activities on a long-term and continual basis, and take initiatives to exchange and share observation data. (MEXT, MLIT)
- Continue to conduct surveys such as bathymetric surveys, marine geological surveys, crustal structure surveys, territorial seas baseline measurements, tidal current observations, etc. in order to collect and compile fundamental information required for marine resources development, preservation of marine interests and comprehensive marine management. (MLIT)

b. Surveys to Understand Climate Change and the Maritime Environment

- To understand the reality of climate change, ocean acidification, and other global changes, we will participate in the international oceanographic observations planned by the World Meteorological Organization (WMO⁷⁸) and UNESCO/IOC to carry out high-precision and high-density observations by oceanographic research ships. We will also use autonomous observation systems such as sub-surface floats⁷⁹ and promote the introduction of underwater gliders and other sophisticated technologies to consistently measure sea water temperature, salinity, and greenhouse gas concentrations. (MEXT, MLIT, MOE)
- Evaluate the impact on marine environment of pollutants emerged from land or sea, including oil, heavy metals and endocrine disrupting chemicals, and reveal secular variations in

⁷⁸ World Meteorological Organization. A specialized agency of the United Nations established in 1950 based on the WMO Convention to promote and coordinate international programs aiming to facilitate development of international meteorology projects.

⁷⁹ Autonomous tubular instruments about one meter in length, which measure and transmit data on water temperature and salinity while moving up and down in the ocean.

background values, to implement measures effectively and efficiently to preserve the marine environment around Japan. In addition, monitor radioactive materials in the sea. (MLIT, MOE)

- Continue to monitor hazardous or radioactive materials to realize the impact on the marine environment of events such as the seaward flows of articles and oil pollution in the sea caused by tsunami, and the emission of radioactive materials from the TEPCO's Fukushima Daiichi Nuclear Power Station in the wake of the Great East Japan Earthquake. (MLIT, MOE)
- We will monitor the marine environment in enclosed coastal seas by surveying nutrients, water quality, bottom sediment, and sea-bottom fauna in Tokyo Bay, Ise Bay, and the Seto Inland Sea. In addition, survey the water quality by sea environment improvement vessels, and observe ocean current by HF radar, and improve the database of marine environment information that collects and shares environment survey data collected by the government and local governments. (MLIT, MOE)

c. Surveys to Reduce Damage Caused by Natural Disasters

- We will strengthen and enhance observations of seafloor crustal deformation, observations of crustal deformation using GPS,⁸⁰ surveys of deformation in seafloor topography, crustal structure probes, tsunami sedimentation surveys, earthquake fault drilling surveys, and observations inside boreholes in order to collect and improve basic information that contributes to earthquake and tsunami prediction and clarify the mechanism of massive subduction-zone earthquakes along plate boundaries. (MEXT, MLIT)
- Collect and compile bathymetric data used for measures against tsunami such as evacuation of ships in harbors, and for the preparation of making up tsunami hazard maps by local governments, and promote improvement of tsunami information maps for ships. (MLIT)
- To collect and compile basic data that can help forecast of volcanic eruptions, conduct periodical monitoring with airborne or satellite images, surveys of bathymetry by research vessels, geological structure, gravity and geomagnetism, for volcanic islands and submarine volcanoes especially around Nanpo Shoto Islands and Nansei Shoto Islands. (MLIT)

⁸⁰ Global Positioning System

- In addition to implementing meteorological and hydrological observation using research vessels, drifting ocean data buoys, coastal wave observation systems, tide gauges, the Himawari meteorological satellite, and weather radar, we will conduct earthquake and tsunami observations to ensure the safety of ships and coastlines. (MLIT)

(2) Promote Research and Development of Marine Science and Technology

a Promotion of Research and Development Regarding Important Issues the Government Is Required to Deal with

① Research and Development Related to Projection and Adaptation to Climate Change

- We will strengthen observations and survey research to clarify interactions between the sea and the atmosphere as well as the heat transport and carbon cycle associated with material cycles in the surface of the Earth including the land mass, the ocean acidification associated with increased carbon dioxide absorption by the oceans and its impact on the marine ecosystem. (MEXT, MLIT)
- To observe and monitor climate change and its impact and to reduce long-term climate change, we will promote research and development to improve the accuracy of projection information in addition to collecting and improving information that will form the basis for climate change risk assessment. As well as improving climate models, we will enhance survey research and observations suited to the needs of each region to facilitate impact assessments at the regional level in each prefecture and administrative division in an effort to adapt to the impact of long-term climate change. (MEXT, MLIT, MOE)
- There are fears that environmental change in the Arctic region, where the impact of global warming is striking, will accelerate global warming, raise global sea levels, and increase the frequency of extreme weather. In light of the importance of Antarctica to the formation of the global climate system, we will continue to conduct observation and research in both polar regions. (MEXT)

② Research and Development Related to the Development of Marine Energy and Mineral Resources

- To collect data and other materials through wide-area scientific surveys that become a basis for estimating promising mineral deposits of energy and mineral resources, develop and improve platforms, such as research vessels that survey a wide area of the seafloor, manned research submersibles, AUV and ROV, and wide-area exploration systems that use cutting-edge sensor technologies. At the same time, strengthen capabilities of surveys and research of marine resources mainly by conducting research and development of new exploration methods through the establishment of a mineral deposit creation model. We will also promote international standardization of environmental impact assessment technologies for mineral resources development (CAO, MIC, MEXT, METI, MLIT, MOE)
- In terms of research outcomes of the SIP Next-Generation Technology for Marine Resources Exploration, a program we have been working on since fiscal 2014, the Integrated Ocean Resources Exploration System will be established at a practical level through test operations in unexplored areas of the ocean. (CAO, MEXT, MLIT)
- In light of the outcomes of the SIP Next-Generation Technology for Marine Resources Exploration, we will further strengthen and develop Japanese technologies for marine resource exploration to radically improve productivity in the field. As of fiscal 2018, the SIP Innovative Technology for Exploration of Deep Sea Resources will be relaunched to exploit the abundance of marine mineral resources⁸¹ in the Japanese EEZ. As well as further strengthening and developing the technologies for marine resource exploration and production developed in the past, we will pioneer initiatives to develop and demonstrate these technologies at depths below 2,000 meters with an eye to turning basic research into commercial and practical applications. (CAO, MEXT, METI, MLIT)
- We will promote integrated analysis of high-definition surveys and large-scale data obtained from long-term environment monitoring as scientific research contributing to environmental

⁸¹ There is a confirmed presence of seafloor polymetallic sulfide deposits, cobalt-rich manganese crust, rare earth muds and other marine mineral resources in the Japanese EEZ.

impact assessment of marine resources (MEXT)

③ Research and Development of Marine Ecosystem Conservation

- From the perspective of the sustainable use of marine biological resources, we will use marine environment surveys to understand how changes in the marine environment impact on fishery resources. We will also promote research and development to comprehensively understand the structures and functions of marine ecosystems and how they change. In addition, we will seek to improve information about the biological characteristics and diversity of marine organisms, which are necessary for the conservation of coral reefs and other marine ecosystems. (CAO, MEXT, MAFF, MOE)
- To gain an understanding of the status of recovery of marine ecosystems that have drastically changed in the aftermath of the Great East Japan Earthquake, implement surveys and research on marine ecosystems in the Pacific Ocean off the Tohoku region by creating a network of universities, research institutions and other organizations. (MEXT, MOE)

④ Research and Development on Natural Disasters Originating in the Ocean

- To improve warning systems and to uncover the mechanism of the occurrence of earthquakes and tsunami in marine zones by accurately and promptly detecting them through dense observation networks, we will operate seafloor observation networks (S-net, DONET etc.) that facilitate real-time observation of earthquakes and tsunami along the Japan Trench and Nankai Trough. We will also examine observational research systems intended to respond to large-scale earthquakes and tsunami expected to occur along the Nankai Trough. In addition, we will conduct surveys and research on forecast of the occurrence of earthquakes and tsunamis in marine zones surrounding the Japanese archipelago, including the Sea of Japan, and of the damage from them, and based on such surveys and research, implement research on measures for disaster preparedness and mitigation. (MEXT)
- By conducting basic research on the dynamic behavior of the various phenomena on the solid Earth from its surface to the core, increase knowledge about causes of earthquakes and volcanic activities triggered by the movement of oceanic plates, the evolution of island arcs

and the continental crust, changes of the Earth's environment, the structure under the seabed and other matters. At the same time, create models of earthquake, tsunami and volcanic activities and conduct forecasts and verifications. (MEXT)

- To prevent and alleviate damage from disasters originating in the ocean, we will research high wave and storm surge forecasting, tsunami warnings, and sophisticated marine environment information. (MLIT)

b. Promotion of Basic Research and Research and Development Based on Medium-to Long-term Perspectives

① Promote Basic Research

- By strengthening the initiative to broadly and continually promote unique and diversified basic research, open up intellectual frontiers, seek to create common intellectual assets of mankind and accumulate insightful knowledge. (MEXT)
- In light of the rapid expansion of open science, data and samples obtained from observation and research activities will, as a rule, be organized, stored, and provided in a format that is accessible to researchers and the general public. We will also promote the utilization of researchers and engineers working in other fields. (MEXT)
- We will use the deep sea drilling vessel *Chikyu* to advance the International Ocean Discovery Program (IODP⁸²). IODP takes direct samples of the substances that make up the Earth for analysis and on-site observations. The program aims to build dynamic models of the interior of the planet in relation to the ocean, the Earth, and organic life and to promote understanding while using numerical analysis techniques and modeling techniques. (MEXT)
- To understand the mechanism of the large earthquakes, explore a marine deep subsurface biosphere and find out its functions, and implement drilling of the mantle in the future, promote steady development of infrastructure technology for drilling deep-water and great

⁸² International Ocean Discovery Program. A multinational scientific research collaboration launched in October 2013. The project uses drill ships provided by Japan, the United States, and Europe to drill into the seabed around the world to collect and analyze geological samples (drill cores). By analyzing and researching data obtained from equipment installed in the boreholes, the project hopes to unravel the mysteries of the Earth and life.

depth. (MEXT)

② Developing Human Resources for Marine Science and Technology

- To promote marine research and development in the future and to find solutions to economic and social issues based on marine science technology, we will improve the quality and class of human resources working in marine science and technology and who have expertise and the ability to see the bigger picture. (MEXT)
- As well as aiming for a curriculum that promotes interdisciplinary education and research at universities and graduate schools, we will promote hands-on internships in collaboration with the industrial world and train forward-thinking human resources for marine science and technology by implementing pragmatic initiatives such as continuing education for working adults. (MEXT)

c. Improving and Strengthening Common Infrastructure of Marine Science and Technology

① Development of the World's Leading Infrastructure Technology

- To move forward with the construction of highly precise and efficient observation and exploration systems, we will promote progressive research and development of advanced elemental technologies such as acoustic communication and compound communication systems, measurements and sensing, positioning, detection, monitoring, sampling, and analysis; energy system technologies required for the long-term operation of exploratory and observational systems; and technologies for installing sensors and observation platforms to explore and observe the deep seabed. (MEXT)
- We will operate underwater and seafloor exploration systems and their subsystems to efficiently explore the deep sea and other unknown areas, and 3D observation systems to conduct highly precise observations of extensive ocean spaces in the long term. (MEXT)
- From the perspective of promoting open innovation, we will examine standardization

strategies, intellectual property strategies, and open and closed strategies⁸³ for basic technologies, promote collaboration and cooperation with universities, corporations, and public research organizations in Japan and abroad, and encourage initiatives to plow knowledge, technology, and outcomes back into society. In particular, we will promote initiatives aimed at international standardization of intellectual property. (MEXT)

② Development and Management of Platforms

- We will develop and operate research platforms for research ships, unmanned submersibles (AUV, ROV), manned submersibles, test tanks, supercomputers, and basic technologies for transmitting large volumes of observational data. (MEXT, MLIT)
- With regard to ships, probes, and supercomputers owned by research institutes and universities, we will systematically replace equipment and advance measures to counteract deterioration to bring out the best performance. We will also promote shared use to make effective use of the limited research base. (MEXT)
- We will promote research and development of high-speed communication technologies that use satellites to transmit large volumes of marine data. (CAO, MIC)

③ Organize and Use Marine Big Data

- We will promote the cutting-edge integrated information science needed to advance the oceanography and earth sciences and we will maximize the use of supercomputers to strengthen Big Data, AI, and other basic technologies that underpin the Super Smart Society⁸⁴ by means of collecting and analyzing the varied and vast data (marine Big Data) obtained from marine surveys and observations. (MEXT)
- To contribute to new value creation and solutions to economic and social issues using marine

⁸³ A combined strategy that distinguishes between core domains such as patents owned by business operators (closed) and non-core domains such as published theses (open) where the former is monopolized and the latter permits work with partners.

⁸⁴ A connected society that uses cyberspace to overcome the barriers between various industrial fields.

Big Data, we will use the Data Integration and Analysis System (DIAS⁸⁵), which is the global environmental information platform, and promote the use of information while aiming for collaboration and convergence with other fields. (MEXT)

6. Preserve Remote Islands and Develop EEZ

(1) Preserve Remote Islands

a. Preserve and Maintain Remote Border Islands

① Promote Stable Preservation and Maintenance of Remote Border Islands and the Low Tide Line

- To preserve the low tide line which is the justification for the outer edge of the EEZ, we will regulate seafloor excavation and other activity inside the low tide line protection zones based on the Low-Tide Line Preservation Act and the Basic Plan Concerning Preservation of the Low Tide Line and Development of Facilities to Promote the Preservation and Utilization of the Exclusive Economic Zone and Continental Shelf (decided by the Cabinet in July 2010). To understand the situation in the low tide line zones, we will also conduct surveys using continuous patrols by ships and helicopters, periodic aerial photography, or satellite images. (MLIT)
- Centered on the Cabinet Office and in collaboration with the ministries and agencies concerned, we will properly preserve and maintain the remote border islands by using satellite imagery and other means to have an ongoing understanding of the situation on the coastlines on remote islands. (CAO, MEXT, MAFF, MLIT, MOE, MOD)
- Okinotori Island, which is an extremely important island for preserving the national territory, is under direct government control and activities are regulated on the basis of the Coast Act to prevent human-induced damage. In addition, we will preserve the coral reefs that form the

⁸⁵ Data Integration and Analysis System. An information system that accumulates and conducts integrated analysis of global environmental Big Data (observational information, forecasting information, etc.) and contributes to solving climate change and other global problems.

island and strengthen management including the renewal of observation and monitoring facilities planned for fiscal 2019. We will also promote measures to prevent erosion by maintaining and improving coastal protection facilities. With regard to the coastal protection zones on other remote islands, we will also promote erosion controls and preservation in a manner that is integrated with the low tide line from the perspective of preserving the national territory. (MAFF, MLIT)

- To preserve the low tide line in a manner that is reliable and efficient, we will manage all information about low tide lines centrally. We will maintain and upgrade the Low Tide Line Database to facilitate sharing among stakeholder organizations of information about the position of low tide lines, administrative divisions, diagrams, photographs, and usage situation as well as information about the naming of remote border islands where the low tide line is located, their positions, and facilities. (MLIT)
- To facilitate the security and stability of marine resource development and use, marine surveys, and other activities on remote islands and areas of the ocean that are far removed from mainland Japan, we will promote the establishment of designated remote island port facilities on designated remote islands (Okinotori and Minamitori Islands) as base facilities required for the transport and supply of crews and goods. The aim is also that the government will maintain and use the ports. (CAO, MLIT)
- In accordance with the Inhabited Remote Border Island Act and the Basic Policy for Maintaining Regional Communities in Designated Inhabited Remote Border Island Regions and Inhabited Remote Border Island Regions (Prime Minister's decision in April 2017), which is based on said Act, we will support the functions of inhabited remote border island regions as bases for operations related to protecting territorial waters. We will also promote measures to preserve and support local communities to achieve a situation where in-migration regularly exceeds out-migration in designated inhabited remote border island regions by 2027. (CAS, CAO, NPA, MIC, MLHW, MAFF, METI, MLIT, MOE, MOD)
- Recognizing that the manner of using territory considered important for the preservation of remote border islands has implications for national security, we will develop understanding of the ownership situation from the perspective of preserving "Territorial Waters, etc." and securing marine interests. We will study the manner of using the land and any necessary

measures while bearing in mind the issues associated with land where ownership is unclear, or opinions regarding territorial acquisition by foreign parties. (CAO)

② Securing Safety of Remote Islands and Implementing Observation Activities

- For securing safety of marine transport, improve lighthouses and other navigational aids established on islands and subject them to maintenance and management. (MLIT)
- For preventing and decreasing damages resulting from typhoons, earthquakes, tsunamis and other natural disasters, improve and properly maintain and manage meteorological and oceanographic observation facilities on islands. In parallel, continue ground and upper-air meteorological observation as well as observation of greenhouse gases, ozone and solar radiation. (MLIT)
- Development for geospatial information of remote islands that also contributes to monitoring oceanic plate. (MLIT)

③ Conserving Natural Environment on Islands and in Surrounding Marine Zones

- Since islands with unique ecosystems separated by the ocean from other regions and islands with coral reefs or mangrove forests that harbor rich ecosystems are vulnerable to the impact of invasive species, red soil inflow and other human activities, we will properly conserve, manage and restore valuable ecosystems on these islands while securing biodiversity. (MAFF, MOE)
- There are valuable fishing grounds in marine zones around islands with seagrass bed/algal bed, tidal flats and coral reefs. Conserve and rehabilitate the environment of fishing grounds and improve the fishing grounds. Bolster activities of fishermen and local residents to maintain and manage seagrass bed/algal bed, tidal flats and coral reefs in efforts to improve the habitat environment for aquatic plants and animals and restore fishery resources. (MAFF)
- To preserve the outstanding natural landscape, ocean vistas, and natural coasts, we will use the coastal area in an appropriate manner and properly utilize the natural parks system. (MAFF, MLIT, MOE)

- Conduct activities of removing articles drifting and washed ashore, moving such articles away from islands and constructing waste disposal facilities. (MOE)

b. Promote Remote Islands

① Developing Industries on Remote Islands

- Take different actions for encouraging more people to live permanently on remote islands, including reduction of marine transport expenses for nurturing strategic industries and increasing job opportunities, sightseeing promotion for increasing exchange and acceleration of efforts to create safe and reassuring living conditions. (MLIT)
- To maintain and revitalize fisheries on remote islands, we will target fishing communities on remote islands to support joint activities to tackle the revitalization of fisheries. (MAFF)
- Facilitate new and additional machinery and other equipment for municipal governments which have plans for industrial development on islands manufacturing, agricultural product distributors, hotel, information service and other businesses. (MLIT)
- For attaining constant and appropriate supply of energy and reducing environmental burdens, encourage utilization of renewable energy based on natural characteristics of islands. (MOE)
- Implement a comprehensive study on a special zone system for islands in order to develop islands based on local innovative ideas. (MLIT)

② Maintaining Transport and Communication

- From the perspective of providing convenience for inhabitants on remote islands and stimulating marine sightseeing with the use of local resources, provide support for stably maintaining sea and air routes to and from the remote islands. (MLIT)
- Compared to the mainland, the price of petroleum products is fairly high on remote islands. Aiming to provide stable and inexpensive supplies, we will support substantial reductions in the retail price for gasoline. (METI)
- To streamline the flow of information and to improve communications systems including advanced information and telecommunication networks, we will support deployments of facilities and transmission lines to facilitate the use of ultrahigh-speed broadband services and

cell phone services. (MIC)

③ Maintaining Medical Care and Fostering Education and Culture

- Economic burdens should be reduced for expecting mothers living on islands at the time of receiving medical checks and giving childbirth away from their islands. (MHLW)
- Economic burdens should be lowered for high school children living on islands without high school in the case of commuting to high school or living outside their islands. (MEXT)

④ Constructing Infrastructure

- Conduct construction of infrastructure for industrial development on islands, including roads, ports and other infrastructure for agriculture, forestry and fisheries and living infrastructure for an improved environment for permanent living. (MAFF, MLIT)

(2) Promotion of Development of EEZ and Continental Shelves

a. Maintenance, etc. of EEZ and Continental Shelves

- With regard to the extension of the continental shelf, we will implement initiatives in line with the Future Policy for Extending the Continental Shelf. (CAO, MOFA, MEXT, MAFF, METI, MLIT)
- We aim to resolve problems associated with overlapping claims to ocean areas by Japan and other countries on the basis of international law. (MOFA)
- To move forward with the above-mentioned initiatives, we will maintain and strengthen the maritime order based on “the rule of law” by the proper implementation of international rules centered on the United Nations Convention on the Law of the Sea. (CAO, MOFA)

b. Improving the Foundations and Environment to Promote the Effective Use of EEZ

- To work toward the effective use of the EEZ, we will promote improvements to the fishing

grounds that contribute to the sustainable use, protection, and expansion of fishery resources. We will also steadily move forward with technology development aimed at developing energy and mineral resources. (MAFF, METI)

- To improve basic information about the effective use of the EEZ, we will continue to promote marine surveys, advance the centralization of maritime information, and disclose maritime information while bearing in mind the strategic nature of information. (CAO, MOFA, MEXT, MAFF, METI, MLIT, MOE, MOD)
- The Second Basic Plan on Ocean Policy states that, “In order to promote exploitation and exploration in the EEZ and the continental shelf, the Government should introduce a policy on appropriate management of the EEZ and the continental shelf, taking into account the current progress and the future outlook of exploitation and exploration in these maritime zones. This policy should establish the purpose, procedure, plan and schedule of management in the EEZ and the continental shelf. Based on the policy, the Headquarters for Ocean Policy under the Cabinet should examine the establishment of comprehensive laws and regulations for the management of the EEZ and the continental shelf, with extensive consideration for the rights and duties of the coastal states, harmonization between the exploitation and conservation of the environment, development of an efficient coordination mechanism, facilitation of ocean surveys, and the centralization and publication of ocean-related information and data.” Since this plan was formulated, the Study Team on EEZ and Other Ocean Management at the Meeting of the Headquarters for Ocean Policy have published their summary (June 2014) and the Project Team for Promoting Ocean Utilization established under the Councilor’s Meeting have also published their report (March 2015, February 2016, February 2017). We are promoting a comprehensive legal framework on this basis.

In this case, we need to respond properly without letting the opportunity slip with regard to how to advance measures based on existing laws and how to make practical adjustments in the designated ocean areas.

With regard to Marine Spatial Planning (MSP)⁸⁶, already introduced in several other

⁸⁶ A management and utilization plan which aims for comprehensive ocean management and the sustainable use of diverse resources.

countries, we will strive to understand the facts of MSP and we will study needs, issues, and feasibility in light of the reality of the use of Japan's ocean areas and the relationship with existing domestic laws and regulations. (CAO)

7. Promoting Arctic Policy

(1) Research and Development

a. Strengthening Research Initiatives in the Arctic Region

- Based on the Arctic Challenge for Sustainability (ArCS⁸⁷), we will continue to promote international joint research by collaborating with the natural science and the social science disciplines with the aim of developing a comprehensive understanding of the environmental changes in the Arctic and their impact on the whole planet, to clarify the social and economic impact, and to provide stakeholders with information to facilitate appropriate decision-making and solutions. We will also address Japan's Arctic policy by leveraging Arctic research, one of Japan's strong points, where government and researchers work together. (CAO, MIC, MEXT, MAFF, METI, MLIT, MOE)

b. Strengthening the Observational and Research System Pertaining to the Arctic Region

- To obtain and analyze scientific data on the Arctic region with the aim of further clarifying the variability mechanism in the Arctic environment, we will develop sophisticated satellites, which is one of Japan's strengths, and bolster continuous observation using research stations

⁸⁷ Arctic Challenge for Sustainability. A national Arctic research project running for approx. 4.5 years from September 2015 to March 2020. Funded by the Ministry of Education, Culture, Sports, Science and Technology, the key players are the National Institute of Polar Research (NIPR), the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) and Hokkaido University. The project aims to elucidate the rapid climate changes in the Arctic region, to clarify the environmental changes and their effect on society, and to provide internal and external stakeholders with accurate projections and environmental impact assessments so that they can make appropriate decisions on sustainable development in the Arctic region.

and research ships. To do so, we will promote advanced technology development such as AUV for Arctic observations. We will also upgrade the microwave radiometers which are essential for sea ice observation in the polar regions and which also contribute to monitoring of global warming. (MEXT)

- We will consider the construction of an Arctic region research ship with icebreaker capacity as a new international research platform for the Arctic with functions and performance that will facilitate participation in international Arctic region observation programs using AUV. (MEXT)
- We will encourage interdisciplinary initiatives by means of networked research hubs of several Japanese universities and research institutes, as well as the joint use of research ships, water tank facilities, supercomputers and other research infrastructure. We will promote initiatives aimed at finding solutions for the Arctic. (MEXT, MLIT)

c. Promoteing International Cooperation in Science and Technology for the Arctic Region

- We will promote scientific and technology cooperation in polar research and related areas with the Arctic States and other relevant countries on the basis of bilateral agreements on cooperation in science and technology. We will also strengthen international collaborative research concerning the Arctic by dispatching researchers and securing research and observation stations in the Arctic nations. (MOFA, MEXT, MOE)
- To promote research in the Arctic region where scientific data is lacking, we will create frameworks where research institutions and individual researchers can share their data. We will also participate in the planning of international frameworks to share data. (MEXT, MLIT)

d. Developing Human Resources to Contribute to Solutions for the Arctic Region

- For Japan's research on the Arctic to evolve continuously, we will address education for young researchers, dispatch young human resources to universities and research institutes abroad through the ArCS initiative, and educate human resources who are able to lead the international debate on solutions for the Arctic region. (MEXT)

- To contribute to solutions in the Arctic region, we will promote measures to support education and research to train and secure specialist human resources, regardless of whether they are in the natural sciences or the humanities and social sciences, through the ArCS initiative. (MEXT)

(2) International Cooperation

a. Proactive Participation in the Formulation of International Rules based on the Rule of Law

- Bearing in mind the economic and security environments surrounding the Arctic, Japan will proactively work with other countries by making use of multilateral fora including the Arctic Council (AC⁸⁸) and bilateral dialogues with the Arctic States so that principles of international law including freedom of navigation is respected in the Arctic Ocean based on the United Nations Convention on the Law of the Sea. (MOFA)
- We are facing challenges caused by the impacts which the environmental change in the Arctic region poses to the global environment including climate change. We will share our scientific knowledge based on Japan's observation and research on the Arctic with the international community through multilateral and bilateral frameworks. As a major player in the discussions on the Arctic, we will contribute to resolve global challenges through a wide range of our international cooperation. For that purpose, Japan will consider the possibility of further engagement, including setting a new agenda responding to actual challenges, bearing in mind the **promotion** of our activities in the Arctic region such as economic activities. (MOFA, MEXT, MOE)
- We continue to participate proactively in the rule-making process with relevant countries including the coastal states for the conservation and management of fishery resources, aiming at the sustainable use of the resources based on scientific evidences in the high seas of the

⁸⁸ Arctic Council was established by the eight Arctic States (Canada, the Kingdom of Denmark, Finland, Iceland, Norway, Russian Federation, Sweden, and the United States of America) based on the Declaration on the Establishment of the Arctic Council (Ottawa Declaration) (September 19, 1996). The objective is to promote cooperation on common arctic issues such as sustainable development and environmental protection in the Arctic. (The Ottawa Declaration should not deal with matters related to military security.)

Arctic Ocean. (MOFA, MAFF)

b. Promoting Bilateral and Multilateral Cooperation with the Arctic States and Others

- We further promote discussions with the relevant countries including the Arctic States, while taking account of appropriate balance of bilateral and multilateral frameworks. Japan will make the best use of international frameworks on the Arctic such as the Arctic Science Ministerial,⁸⁹ the Arctic Circle⁹⁰, the Arctic Frontiers⁹¹ and the Trilateral High-Level Dialogue on the Arctic among Japan, China and ROK⁹². Japan will strengthen to disseminate its views and thoughts as well as the results of its observation and research on the Arctic to the international community in order to enhance its presence. To that end, we will consider sending high-level representatives to such fora and hosting ones. (MOFA, MEXT)
- As part of international cooperation, Japan will promote international joint research, exchanges among researchers, and secure research and observation stations in the Arctic region. In so doing, we will make active use of ICT. (MIC, MEXT)

c. Further Contribution to the Activities of the Arctic Council (AC)

- Japan was granted observer status at the Arctic Council in May 2013. We will further strengthen our contributions to the AC which includes more opportunities for Japanese experts and government officials to attend to AC meetings such as working groups and task forces. We will promote policy dialogues with stakeholders including the AC Chair and the states,

⁸⁹ First convened in Washington, DC in September 2015 at the initiative of the United States with the aim of strengthening international cooperation in Arctic research and science. The second ministerial meeting is scheduled to take place in Berlin in October 2018.

⁹⁰ The Arctic Circle is a network of international dialog and cooperation on the future of the Arctic with participation from governments, researchers and corporations.

⁹¹ The Arctic Frontiers is an international conference where participants from governments, corporations and academia discuss sustainable development in the Arctic. It has held in Tromsø, Norway, in late January every year since 2007. The secretariat is operated by a Norwegian private sector.

⁹² The Trilateral High-level Dialogue on the Arctic was launched to share Arctic policies, explore cooperative projects and seek ways to deepen cooperation over the Arctic. The dialogue was held twice, in April 2016, Seoul and June 2017, Tokyo.

and strengthen our contributions to the Arctic issues as an important player. (MOFA, MEXT, MOE)

- For the promotion of our further contributions to the AC, we will pay close attention to the discussions in the AC which includes the role of observers and proactively participate in the discussions on how the AC should be, including expansion of the role of observers. (MOFA)

(3) Sustainable Use

a. Utilizing the Arctic Sea Route

- As well as clarifying the natural, technical, institutional, and economic issues of the Arctic Sea Route, we will promote environmental improvements to facilitate the use of the Arctic Sea route by Japanese shipping companies such as studying the necessary infrastructure and building navigational support systems including sea ice projection systems and weather forecasting systems. (MEXT, MLIT)
- Conduct experimental tests to create sea ice flash charts for safe navigation along the Arctic Sea Route, by using sea ice observation data collected by satellites such as the Water Circulation Change Observation Satellite (GCOM-W⁹³) and Advanced Land Observing Satellite-2 (ALOS-2). (MEXT)

b. Securing Protection of the Marine Environment in the Arctic Sea

- In order to contribute to measures to control climate change in the Arctic region, Japan will work toward the appropriate implementation of the Paris Agreement and the SDGs in Japan in collaboration with the ministries and agencies concerned. (MOE)
- We will actively participate in discussions at the Arctic Council working groups and other related fora about problems with the marine environment in the Arctic Sea. We will contribute more to studies of prevention and countermeasures through the application of cutting-edge scientific technologies, and the scientific knowledge and experience of the government,

⁹³ Global Change Observation Mission – Water. GCOM has built a system for continuous and long-term (10-15 years) global observation to clarify the global scale of climate change and the water cycle mechanism. The purpose is to demonstrate the effectiveness and to use the data for climate change research, weather prediction, and fisheries.

academia and corporations in Japan. (MEXT)

c. Promoting a Sustainable Maritime Economy in the Arctic Region

- Japan encourages Japanese business community to proactively participate in international fora such as the Arctic Economic Council⁹⁴ and the Arctic Circle so that they can promote the economic activities in the Arctic region. (CAO, MOFA, METI)
- Together, the government, the private sector, and research institutes will consider usage strategies and information-gathering with regard to the development of natural resources in the Arctic region and the use of the Arctic Sea Route in a manner that is compatible with environmental protection. (MEXT, METI, MLIT)

8. Secure International Coordination and Promote International Cooperation

(1) Formulate and Develop Maritime Order

- To ensure appropriate implementation of UNCLOS including other international rules, Japan should positively participate in ocean-related discussions at organizations such as the United Nations and proactively participate in the development of international agreements regarding the ocean at the IMO meetings and other opportunities and in international coordination and cooperation regarding the ocean. (MOFA, MLIT)
- To contribute to the formation and development of the maritime order, Japan will seek resolutions of maritime disputes based on international rules. Japan should place emphasis on active utilization of independent bodies such as international judicial bodies, and share this idea with other countries. And Japan will also proactively support activities of international judicial bodies in the marine-related fields, including those by the International Tribunal for the Law of the Sea. Moreover, we will develop persuasive arguments based on international law and promptly strengthen the domestic institutions in preparation for international

⁹⁴ The Arctic Economic Council was created in September 2014 based on recommendations approved at the Senior Arctic Officials meeting of the Arctic Council in March 2014. Only representatives of the Arctic Council members and the Permanent Participants (six Indigenous peoples' organizations) can participate in the decision-making of the Arctic Economic Council.

litigations. In addition, to facilitate appropriate responses based on international law by the coastal nations along the sea lines of communication, we will strengthen cooperation with lawyers in these countries by conducting international conferences and international law moot court competitions organized by Japan and contribute to human resource development. (MOFA)

- As well as raising Japan's profile in the international community, we will instill the international community as a whole with the two principles of the Rule of Law at Sea and Policies Based on Scientific Knowledge by making proactive use of the Our Ocean Conference venue, which is attended not only by governments but by a broad range of bodies including NGOs and corporations, to broadly disseminate initiatives by Japan's government and private sector in our capacity as an oceanic nation. (CAO, MOFA)

(2) International Coordination with Regard to the Sea

- Japan should actively participate in international frameworks that deal with maintain issues and try to take the initiative in activities carried out under the coordination and cooperation of international society. In particular, to ensure the freedom of navigation and safety on very long sea routes, which are the basis for securing economic and other aspects of Japan's safety, we proactively utilize international frameworks such as the EAS and ARF to strengthen cooperative relationships concerning maritime safety with the relevant countries. We will also shape training support for VTS95 personnel at the ASEAN Regional Training Center. (MOFA, MLIT, MOD)
- Japan should deepen coordination with coast guard agencies of relevant countries through multilateral meetings such as the North Pacific Coast Guard Forum and the Heads of Asian Coast Guard Agencies Meeting and through bilateral meetings with India, the Republic of Korea, Russia and other countries. Japan should also strengthen the international coordination and cooperation systems with relevant countries concerning the marine

environment through participation in NOWPAP⁹⁶, PEMSEA⁹⁷ and other international frameworks. (MOFA, MLIT, MOE)

- Japan will lead discussions based on scientific evidence in Regional Fisheries Management Organizations (RFMOs) to promote appropriate global conservation and management of fishery resources, such as tuna and tuna-like species. (MOFA, MAFF)
- We will cooperate with all countries to counter illegal, unreported, and unregulated (IUU⁹⁸) fisheries that damage the effect of managing resources such as the highly migratory species in the open seas, and we will take the lead on strengthening countermeasures at regional fisheries management organizations. (MAFF)
- To ensure safety at sea, we will actively participate in reviews of international rules including the International Convention for the Safety of Life at Sea (SOLAS⁹⁹) and related policies at IMO. (MLIT)
- We will promote appropriate improvements to international rules on safety at IMO with the aim of making Maritime Autonomous Surface Ships (MASS) a reality. (MLIT)
- Aiming for safety and environmental protection when ships are recycled, the Cabinet decided to request the Diet approval to conclude the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (Ship Recycling Convention) and

⁹⁶ Northwest Pacific Action Plan. Proposed by the United Nations Environment Programme (UNEP), NOWPAP is one of 18 Regional Seas Programs established to manage resources in coastal areas and marine pollution in enclosed coastal seas. In September 1994, member states Japan, the Republic of Korea, the People’s Republic of China, and the Russian Federation jointly agreed to start work on NOWPAP. The Regional Activity Center is located in Toyama and Busan (Korea). The Intergovernmental Meeting, which is the decision-making body, convenes annually.

⁹⁷ Partnerships in Environmental Management for the Seas of East Asia. A cooperative framework with participants from NGOs and all governments in East and Southeast Asia. The purpose is to harmonize marine development with protection of the marine environment in the waters of East and Southeast Asia. The program was set up in 1994 by the United Nations Development Program (UNDP) with funding from the Global Environment Facility (GEF). PEMSEA promotes Integrated Coastal Management (ICM), a government-centered approach to integrated and systematic management of coastal areas—the interfaces between land and water—with the participation of a range of stakeholders.

⁹⁸ Illegal, Unreported and Unregulated

⁹⁹ International Convention for the Safety of Life at Sea. Before 1914 when the first international treaty was agreed in response to the sinking of the *Titanic*, the responsibility for safety on ships had been delegated to individual countries. The current version of the treaty (the International Convention for the Safety of Life at Sea) was adopted in 1974. The treaty regulates the technical requirements for safe navigation, the measures that must be implemented on board, ship construction and equipment.

submitted the bill to the Diet in February 2018. Aiming for an early conclusion of the Convention, we are moving forward with preparations to facilitate its early entry into force. To implement the Convention in Japan, the Cabinet decided on a draft law concerning the proper implementation of the demolition of ships in March 2018 and submitted the bill to the Diet. We are continuing to develop domestic laws and ordinances to prepare for the Convention entering into force. (MOFA, MHLW, MLIT, MOE)

- With regard to the prevention of terrorist attacks in the sea and the proliferation of weapons of mass destruction by maritime transport, the Protocol of 2005 to the Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation and other agreement are to be concluded at an early stage. (MOFA)

(3) International Cooperation with Regard to the Sea

a. Marine Research and Marine Science and Technology

- To address global issues such as climate change, ocean acidification and biodiversity, we will continue to take part in planning and to contribute to data exchange frameworks and international ocean observation programs including the Argo Project, which is implemented by the relevant ministries and agencies as well as WMO, UNESCO/IOC and other relevant organizations. (MOFA, MEXT, MAFF, MLIT)
- Based on the results of marine surveys, we will continue to propose nomenclature for seafloor topography to the Sub-Committee on Undersea Feature Names (SCUFN¹⁰⁰) and contribute to the standardization of the nomenclature of seafloor topography. (MLIT)
- To promote oceanographic observation research with a view to assessing the impact on the environment of the atmospheric and oceanographic fluctuations in the Arctic Sea, the Pacific and Indian oceans, which are issues of increasing concern worldwide in recent years, we will enhance international cooperation in the field of oceanographic observation in coordination with the relevant organizations in Japan and abroad including bilateral cooperation based on agreements on cooperation in science and technology. (MOFA, MEXT, MOE)

¹⁰⁰ Sub-Committee on Undersea Feature Names. An academic committee set up to standardize seafloor topography nomenclature worldwide.

- We will continue to take part in planning the IODP, which uses Japan's deep sea drilling vessel, *Chikyu*, and North American and European drilling vessels around the world. We will also build cooperative frameworks not only with the United States and Europe, but with the countries in the Asia Pacific. (MEXT)

b. Marine Environment

- From the viewpoint of ensuring biodiversity, Japan should promote efforts for surveys and research on the marine environment and biosphere under international cooperation with regard to the protection of coral reefs and animals that migrate wide areas. (MOE)
- At international conferences such as the International Conference on the Environmental Management of Enclosed Coastal Seas (EMECS) (EMECS101), Japan should inform other countries of its measures for protecting the marine environment, such as the Total Pollutant Load Control System (TPLCS) and initiatives for creating sato-umi (a coastal area where biological productivity and biodiversity has increased through human interaction). (MOE)
- Japan will promote coordination and cooperation with the Pacific Island Countries and other countries toward solution of issues common to those countries and islands of Japan, such as preservation and management of islands, management of their surrounding ocean areas, as well as fishery resources, and response to climate change. (MOFA, MAFF, MOE)

c. Security Measures for the Sea and Securement of Navigation Safety

- Japan should contribute to strengthening the qualities of seafarers in other countries through the International Cooperative Training Project for Asian Seafarers and other programs.¹⁰² Japan should also contribute to strengthening the qualities of people in other countries involved in maritime affairs through the World Maritime University and other institutions. (MLIT)

101 Environmental Management of Enclosed Coastal Seas. An international conference on the theme of protecting the environment in coastal regions. Organized on a regular basis, the conference aims to pass on to future generations the benefits of the enclosed coastal seas, which are a shared asset for all of humankind.

102 Approved at the ASEAN Transport Ministers Meeting in November 2008, the program aims to promote training for seafarers.

- Among the projects under the Co-operative Mechanism in the Straits of Malacca and Singapore, Japan promotes cooperation related to the maintenance of Aids to Navigation and the development of human resources for the maintenance and management of such facilities under public-private partnerships to ensure the safety of navigation in the straits. Besides, to enhance the safety of navigation in the straits, Japan conducts the joint hydrographic survey and updates electronic navigational charts in cooperation with the littoral States utilizing the Japan-ASEAN Integration Fund (JAIF¹⁰³). (MLIT)
- To boost international coordination concerning port security, Japan should promote assistance for capacity-building and implement joint exercises. (MLIT)

d. Support for Disaster Prevention and Maritime Search and Rescue

- Japan should promote and disseminate its advanced disaster prevention technologies to countries vulnerable to disasters, including Asian countries. Above all, Japan should provide countries in Asia-Pacific and other regions with information on forecast of storm surges and high waves, technical advice and support for information network activities in order to prevent disasters caused by tsunamis, storm surges, high waves and other phenomena, which have been growing more severe due to global warming. (MLIT)
- To prevent and mitigate disasters in the Northwest Pacific coastal nations, we will provide tsunami information to countries where tsunami disasters are a concern. We will also continue to provide technical support for the construction of tsunami warning systems. (MLIT)
- To reduce the risk of disasters caused by tropical cyclones or volcanic eruption in the Asia-Pacific region, we will provide observation data from the Himawari meteorological satellite to meteorological agencies and hydrological services. When requested, we will also conduct target area observation (HimawariRequest). (MLIT)
- To conduct maritime search and rescue efficiently and effectively, Japan should strengthen coordination and cooperation with relevant countries by mutually exchanging information,

¹⁰³ Japan-ASEAN Integration Fund. Established at the ASEAN Secretariat in 2006 with contributions from the Japanese government to support the ASEAN.

implementing joint exercises, etc. (MLIT)

9. Develop Human Resources with Knowledge of the Ocean and to Advance Nationals' Understanding

(1) Train and Secure Specialist HR to Support the Maritime Nation

The marine industries are a set of comprehensive research and development industries as well as crossover industries that cover multiple fields. With this in mind, we will introduce the following initiatives to secure and train specialist human resources who will support the maritime nation. We will also consider the training of human resources with a humanities background who have knowledge of international law.

a. Train Human Resources to Support Marine Development

- As well as moving forward with measures to strengthen initiatives and stakeholder participation in the Nippon Foundation Ocean Innovation Consortium to train internationally qualified engineers and human resources, we will build systems for collaboration with overseas universities, corporations, and research institutes with hands-on programs. We will also examine training programs for tasks on special ships for marine development. (MLIT)
- Under the j-Ocean initiative, we will improve specialist learning tools to systematically and comprehensively cover the knowledge necessary for marine development based on industry needs. (MLIT)
- In light of the characteristics of maritime universities and other institutions, we will advance university-industry collaboration to strengthen pragmatic abilities, consider curricula that pay attention to industry needs, and promote initiatives that contribute to developing the human resources who will support marine development. (MEXT)

b. Develop Human Resources in the Shipbuilding and Marine Industries

- To increase the rate of employment of students in the shipbuilding and marine industries, we will continue with initiatives to communicate the attractions of the occupation. With regard

to shipbuilders, we will continue initiatives to train these highly skilled specialist human resources at training centers for shipbuilding. (MLIT)

- To enhance the attraction of the industry, it is important to raise productivity through i-Shipping and other IoT. We will work toward ICT-centered research and development. (MLIT)
- To continuously secure and train young people who aspire to the shipbuilding and marine industries in light of the new National Curriculum Standard for Upper Secondary Schools (MEXT Notification No. 68 in March 2018), which includes marine engineering as a new subject, we aim to improve the quality of shipbuilding education in high schools by creating and disseminating teacher training programs and classroom materials to train the students who are future candidates for taking on the responsibility for Japan's shipbuilding and marine industries. (MLIT)
- In addition, we will strengthen collaborative systems in regional communities by meeting with Local Transportation Bureaus as well as local education authorities and regional shipbuilders with the aim of improving shipbuilding education based on the needs in each region and to secure and train shipbuilders. (MLIT)

c. Securing and Raising Seafarers

- To train seafarers who are work-ready and have the practical skills to meet the needs of ocean-going and coastal shipping at the Japan Agency of Maritime Education and Training for Seafarers, we will (1) strengthen cooperation among stakeholders and expand training on company-owned ships to enable more practical on-board training by using ships operated by shipping companies, and (2) enhance the education by reviewing the education system for seafarers, working on skills acquisition and implementing a range of training courses in response to the knowledge requirements for seafarers. (MLIT)
- To secure and train seafarers in a stable and effective manner, we will work with stakeholders, including the government and coastal shipping companies, to implement work experience and to promote initiatives to add to the number of young people with ambitions to work in the industry. We will also promote initiatives where shipping operators employ and train

young seafarers. We will raise productivity through work-style reforms such as reducing working hours and workload and by creating attractive workplaces to promote employment and retention of seafarers. (MLIT)

- To systematically secure young seafarers, we will continue to improve the environment to facilitate the participation of women as seafarers and the employment of retired Maritime Self-Defense Force officials. (MLIT, MOD)
- To secure and train outstanding Asian ocean-going seafarers, we will conduct training with the aim of training better seafarers and improving the skills of maritime educators in developing countries. (MLIT)
- To train and secure a stable supply of pilots who are responsible for assisting maritime transportation by ensuring navigational safety and by guiding ships in perilous waters and at strategic points for maritime traffic, we will strengthen recruitment activities and promote the acquisition of multiple licenses in collaboration with the government, pilots and shipping operators. (MLIT)

d. Train and Secure Key Players in Marine Engineering

- To deepen understanding of marine engineering, the public and private sectors will work together to arrange workplace visits for students and to continue exchanges of opinion with engineers working for the government or construction companies. We also aim to expand the number of young people who will be key players in the industry by raising awareness of diving and improving the education for marine engineers. (MLIT)
- To create attractive workplaces, the public and private sectors will work together to continue to improve the working environment by, for example, securing appropriate holidays. (MLIT)
- To pass on the technology to future generations, the public and private sectors will work together to continue to expand opportunities for young engineers to gain workplace experience. (MLIT)
- To improve productivity, we will train people who can handle ICT and we will expand the introduction of ICT including the use of 3D data throughout the whole process from surveys to design, construction, inspection, and maintenance. (MLIT)

- To promote overseas infrastructure development in the Southeast Asian nations and elsewhere, we will proceed further with training for human resources who can handle every project stage from the upstream to the downstream. (MLIT)

e. Train and Secure Key Players in the Fisheries Industry

- To improve the retention rates for new employees in the fisheries industry, we will support training in the workplace and provide employment information to the fisheries industry in order to train the key players in the fisheries of the future. To respond to the shortage of crews on fishing boats, we will support initiatives aimed at the systematic and stable recruitment of crews by fisheries organization. We will also work to secure and train human resources including licensed mariners by delivering new structures to allow them to obtain mariner qualifications at high schools and universities with fisheries courses, fishing industry schools, and fisheries experiment stations. (MEXT, MAFF, MLIT)
- To secure human resources for the fisheries industry and related fields, we aim to improve hands-on specialist education by training and deploying high-quality educators and disseminating successful approaches at the Japan Fisheries Research and Education Agency, the National Fisheries University, and at high schools and universities with fisheries courses, which are the leaders in training human resources for the fisheries industry. We will also continue to improve the education environment including the training ships and school ships. (MEXT, MAFF)
- We will promote the switch to highly profitable operating systems and the sustainable use of fishery resources, including the introduction of ICT for the fisheries industry, while fishery officers will instruct and advise on the introduction of new technologies and knowledge. (MAFF)
- To further expand participation by women in the fisheries industry, we will promote a wide range of activities where women can demonstrate their skills such as processing catches and developing products to meet the needs of consumers. (MAFF)

f. Cross-sectional Measures

- To promote the training of IT personnel in the maritime field, we will conduct R&D projects including research and development that contributes to MDA capacity-building. (MEXT)
- In light of the human resource needs of industry, we will upgrade education and improve the educational environment at schools that provide technical training related to the ocean and fisheries including high schools, vocational schools, maritime, merchant marine and fisheries universities, and educational facilities affiliated with the government. (MEXT, MAFF, MLIT)
- We will systematically and promptly advance the construction of replacements for training ships where aging due to shell plating fatigue has been identified. We aim to steadfastly upgrade education and research by providing new equipment and a safe and secure education and research environment for students. (MEXT)
- To train and secure marine human resources, we will promote retraining for working adults in the maritime field in cooperation with stakeholder ministries and agencies. (MEXT, MHLW, MLIT)

(2) Promote to Educate Children and Young People About the Ocean

- Aiming for marine education to be put into practice in all municipalities by 2025, we will intensify collaboration with the related ministries and organizations under the Nippon Platform for Marine Education. (CAO, MEXT, MLIT)
- By developing supplementary readers (including online content) for school settings, organizing field trips to facilities, promoting career education, and improving the manuals on data usage and materials creation accessible to teaching staff, we will improve the environment so that education providers can continue to work independently. In particular, to deepen scientific understanding of the ocean, the latest research and development content at universities and research institutes will be explained in the supplementary readers according to the developmental stage of the students. (MEXT, MLIT)
- From the viewpoint of developing a comprehensive support system for marine-related education, the government should facilitate organic coordination between school education

and social educational facilities such as aquariums and museums, industrial facilities of the fisheries industry, maritime industries and other industries, organizations that provide opportunities to receive marine-related education, research institutes including National Research and Development Agencies and others. (MEXT, MAFF, MLIT)

(3) Enhance understanding of the ocean among nationals

- To stimulate nationals' understanding and interest in the sea, a variety of measures including public opening of ships of universities or institutions, lighthouses by JCG, training ships and other facilities, study tours of marine-industry-related facilities, work-study programs, beach cleaning campaigns, educational activities on conservation of the marine environment, marine safety and coastal zones, dissemination of marine leisure activities, and activities to deepen people's understanding of the sea, should be implemented under industry-academia-government collaborations and cooperation, through opportunities such as the 'Ocean Day' and 'Ocean Month', in consideration of the meaning of the establishment of 'Ocean Day' as a national holiday. (MEXT, MLIT)
- At the 70th Session of the United Nations General Assembly in December 2015, the assembly acted on a proposal by 142 countries, including Japan, to unanimously adopt World Tsunami Awareness Day (November 5) with the aim of strengthening tsunami countermeasures and raising awareness of tsunami. We will promote international cooperation in the disaster risk reduction fields by conducting tsunami disaster risk reduction drills in countries that are vulnerable to natural hazards and promote awareness-raising activities such as World Tsunami Awareness Day symposiums around the world. (MOFA)
- We will expand opportunities for the public to familiarize themselves with the ocean and we will strengthen the C to Sea Project to broaden public interest and concern for the oceans and ships among children and young people, in particular. As part of these initiatives, we will strengthen public awareness by inviting elementary and junior high school students to participate in various events using the training ships of the Japan Agency of Maritime Education and Training for Seafarers. (MLIT)
- We will promote the use of ICT at universities and research institutes that have a variety of

information about the ocean and encourage use of the media and the Internet to disseminate the information in accessible ways. In particular, we will promote the use of online media, SNS¹⁰⁴, and virtual reality (VR). (MEXT, MAFF, MLIT)

- We will promote the use of expert human resources participating in PR activities at research institutes, the aim being to communicate the attractiveness of the marine sciences and technologies and the actual research activities in accessible ways, and to increase understanding in an effective manner. (MEXT, MAFF, METI, MLIT)
- With regard to underwater archaeological sites as cultural heritage that is important for knowing the history and culture of Japan as a maritime country, the government should consider how to preserve and utilize such sites. (MEXT)
- We will actively work with universities and research institutes to improve content at aquariums and science museums operated by local governments, to open survey ships to the public, to organize lectures and events, to provide experience-based learning, and to study measures to promote the oceans. We will also promote awareness-raising activities and marine education that incorporates local features through networks of industry-academic-government collaboration in regional areas. (CAO, MEXT)

¹⁰⁴ Social Networking Service. Website membership services where registered users can communicate with each other.

Chapter 3. Requirements for Comprehensive and Planned Implementation of Ocean Measures

1. Measures to Implement Plans

In light of the vision behind ocean policy as a national strategy developed by the Headquarters for Ocean Policy, which is composed of the whole Cabinet with the Prime Minister as the Director-General, the Headquarter works with the Administration Office of the Headquarters for Ocean Policy in the Cabinet Secretariat, which handles all practical matters, to perform a control tower function for the government and to actively work toward policy implementation.

Therefore, the Administration Office enlists the cooperation of the relevant government ministries and agencies while taking measures to strengthen coordination in order to implement each measure in a comprehensive and systematic manner. In this instance, the first consideration when promoting ocean measures is the importance of responsible initiatives by the relevant ministries and agencies with authority, knowhow, expertise, and experience pertaining to each measure. It is necessary for the relevant ministries and agencies to be sufficiently aware of this point since they are required to comprehensively promote full-scale initiatives and to work closely together to effectively combine initiatives as a government. It is also important to formulate and promote ocean measures included in other government plans in accordance with the basic policy indicated in the Plan.

In light of these points, we will introduce and reinforce methods to bring about the steady development of measures for the future of ocean policy.

Therefore, we will build steady and effective implementation frameworks for matters determined in the Basic Plan on Ocean Policy by clarifying the processes leading to the realization of the Basic Plan on Ocean Policy and by evaluating the initiatives and the status of their implementation. On this basis, we will introduce and strengthen methods to move forward while tweaking the processes.

From this perspective, we will introduce the following initiatives to fully demonstrate the general coordination function and planning function of the Headquarters for Ocean Policy.

(1) Steady Implementation Based on Checks and Reviews of the Progress of Measures

In connection with the implementation of the measures advocated in the Basic Plan on Ocean Policy, we will manage the process by using the PDCA Cycle to set out specific objectives (Plan), carry out measures (Do), accurately understand and evaluate progress (Check), and revise initiatives based on the result (Act). With regard to the specifics of process management, we will devise ways to contribute to effective and efficient development in line with the character of each measure.

Specifically, as the basis for process management, every fiscal year, we will adjust the progress situation for each measure described in the Basic Plan on Ocean Policy and publish a summary of the adjustments.

In addition, we will devise timetables for each group of measures that share common targets and goals (below, group of measures) and we will describe the targets, the measures to achieve the targets, schedules, and implementation frameworks in the relevant timetable. In doing so, we will endeavor to record in the timetable the indicators that provide an overview and quantitative understanding of the situation with regard to target achievements for all measures including those without numerical targets in the Plan.

When using the PDCA cycle, the relevant ministries and agencies will formulate and review the timetables on the basis of the measures under their jurisdiction (including cases of changing circumstances where ministries and agencies other than the ones listed for each individual measure in Chapter 2 work on the measures), but the Administration Office of the Headquarters for Ocean Policy will adjust the timetables when groups of measures span several ministries and agencies. As well as clarifying the schedule for the PDCA cycle one year in advance and for the next five years, the Administration Office also prepares documentation and methods of advancing the discussion to ensure that the deliberations concerning the timetable and whether the work on the measures is comprehensive and systematic move forward in an efficient and effective manner at the Councilors' Meeting.

As well as reviewing the implementation methods and timetables as necessary with reference to the outcomes of the deliberations at the Councilors' Meeting, the relevant ministries and

agencies will accurately execute the measures on the basis of the deliberations. For matters pertaining to the execution of measures based on other related basic plans, the Councilors' Meeting, the Administration Office, and the relevant ministries and agencies will use the intragovernmental coordination process while taking note of bidirectional deliberations.

(2) Enhance the Investigative Framework at the Councilors' Meeting

To continuously follow up on the situation for implementing the measures advocated in the Basic Plan on Ocean Policy, the ministries and agencies with the main responsibility for implementing each measure are active participants in the Councilors' Meeting.

In case the deliberations at the Councilors' Meeting are focused on technical themes, we form project teams as necessary and invite the participation of a broad range of stakeholders, in addition to the councilors, to provide a framework for focused deliberations. If new actions are considered necessary as a result of the deliberations at the Councilors' Meeting, a proposal is presented to the Director of the Headquarters for Ocean Policy.

(3) Enhance the Functions of the Administration Office

The Administration Office of the Headquarters for Ocean Policy will further strengthen collaborative relationships with the relevant ministries and agencies to be able to follow up on each measure and review the necessary processes with a view to the effective and efficient implementation of each measure by ministries and agencies. In addition, the Administration Office will further deepen collaboration with the industrial sector and endeavor to implement important measures in a steady manner.

2. Stakeholder Obligations and Mutual Cooperation

To promote ocean measures in a comprehensive and systematic manner, it is extremely important to mobilize the knowledge and collective power not only of government organizations, but all stakeholders including local governments, the relevant research and education facilities, the private sector, and public interest groups. It is important for every stakeholder to be actively

involved in a way that is suited to their roles while aiming for various forms of collaboration between the public and private sectors, as well as the industry, academic, government and administrative sectors.

It is important for local governments to have a role-sharing arrangement with the national government tailored to the local situation and characteristics in order to preserve a favorable marine environment by, for example, making efforts to process debris that has washed ashore in coastal areas; to promote fisheries, which is an important industry in regional areas, as well as tourism and other marine industries that draw on local resources; to formulate regional plans for managing land and sea areas in an integrated and comprehensive manner; and to train human resources who understand how to capitalize on the local characteristics. It is also important for operators in the marine industries to steadily promote the development of marine resources; to preserve the marine environment through environmental measures such as technologies that reduce environmental impacts; to manage fishery resources in an appropriate manner; to secure an efficient and stable shipping industry; and to strive to develop new businesses by leveraging advances in information technology. It is important that universities, research institutes, and other organizations strive to promote research and development related to marine science and technology toward realization of a maritime nation. It is important for people and NGOs to strive to deepen their understanding of the ocean by participating in conferences and events related to the oceans, by interacting with operators in the marine industries, and by participating in familiar activities such as beach cleanups to preserve the marine environment.

Being surrounded on all sides by the ocean, there are areas in Japan where the fisheries and shipping industries, the shipbuilding industry, and port-related industries are the core industries. The areas where these industries are concentrated form maritime clusters, which not only reinforce the industrial infrastructure but also revitalize the local economy. From the perspective of revitalizing the local economy, some local governments are actively promoting the marine industries and supporting initiatives that contribute to developing human resources for the marine industries such as improving the content of aquariums and science museums, opening shipyards, survey ships, sailing ships and other training ships to the public, and organizing lectures and events. Since these initiatives contribute to promoting ocean policy across the nation, it is necessary to provide appropriate assistance to expand the initiatives further. Since

the Japanese climate ranges from the subarctic to the subtropical, it is necessary to promote regional measures to facilitate responses to the diverse marine environments.

We will also continue to reinforce collaboration with projects developed in the past such as the Technology Platform for Marine Resource Development which is a private enterprise.

3. Proactive Information Disclosure Relating to the Measures

To publicize the Basic Plan on Ocean Policy nationwide, we will provide information through publications, the Internet, and other media. In so doing, we will create and publish materials that incorporate diagrams, photographs, and other visuals to summarize the points in the Basic Plan on Ocean Policy in a way that is both accessible and approachable.

It is also important to construct information-sharing platforms for stakeholders associated with the policy measures to facilitate mutual coordination when promoting the measures. Therefore, where process management using the PDCA cycle is concerned, we will use appropriate methods to disclose information about the timetables prepared by the relevant ministries and agencies, the outcome of deliberations at the Councilors' Meeting concerning the state of progress for individual measures and timetables, as well as the implementation methods for individual measures and timetable revisions based on the outcome of the deliberations.

In addition, every fiscal year, we will compile and publish documentation on the situation with initiatives by the government and relevant organizations concerning the state of the oceans and the ocean-related measures implemented by the government

Closing Statement

For Japan, in order to protect the seas to secure the safety of its people and its territory, to utilize the seas as the basis for the existence and growth of the economic society, and to leave future generations a legacy in the form of the ocean as a valuable basis for the existence of humankind, it is incumbent on the government and stakeholders to steadily carry out their duties with the nationals' understanding and cooperation, and to strive for the challenge toward a new maritime nation, which is the direction of the ocean policy advocated in the Plan.

Therefore, based on the Plan, the government will steadily and step by step implement each measure in an integrated manner. In light of recent changes and a review of the decade since the Basic Act on Ocean Policy was enacted, we have formulated the Plan from the long-term perspective. As well as making every effort to accomplish the measures outlined in the Plan while bearing in mind the need to respond flexibly to future changes in the maritime situation, Japan will once again take a leap forward to become a world leader and a model for the international community as the maritime nation.