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Proposals on the Revitalization of Coastal Areas using Expertise in Marine Sciences

—Towards a new science-based partnership between industry, government, community and academia—

(provisional translation)

The Japan Society of Ocean Policy, Research Group
"Towards Revitalization of Coastal Regions by the Use of the Ocean Policy Studies Approach"
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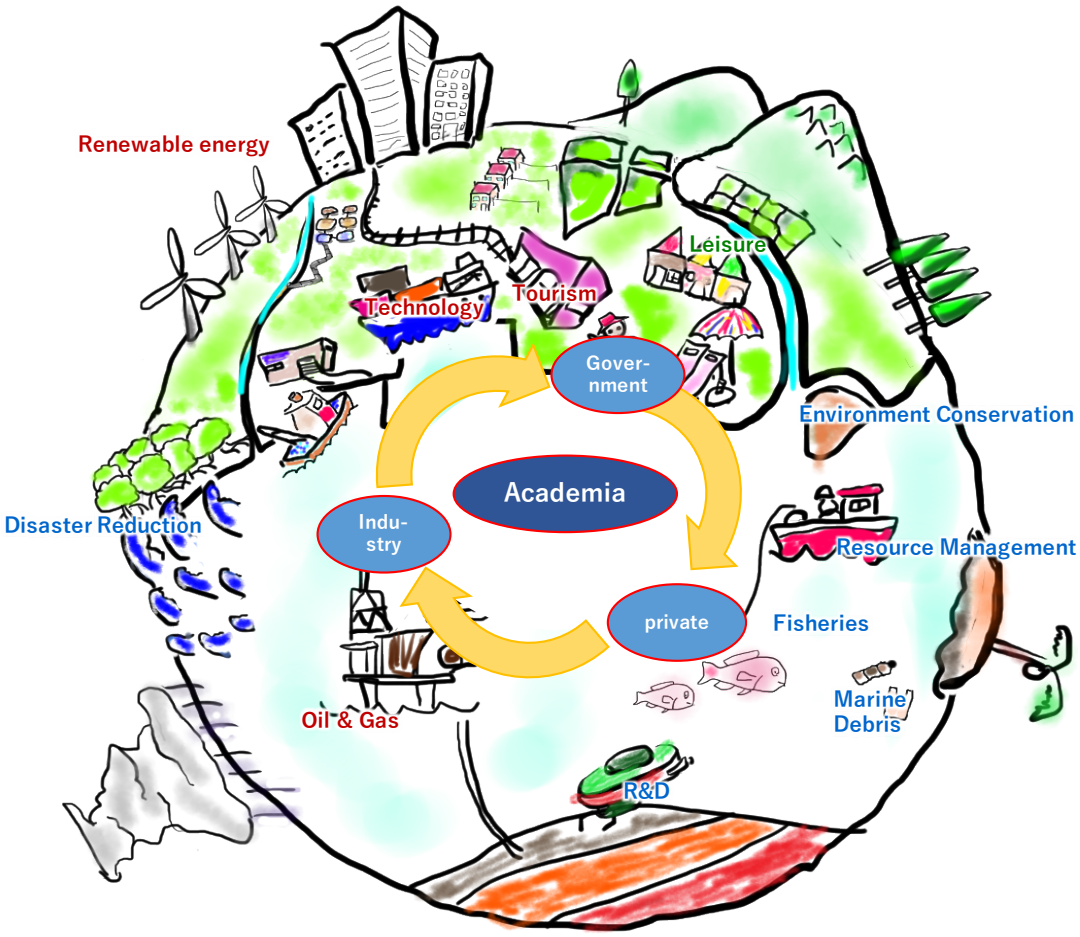


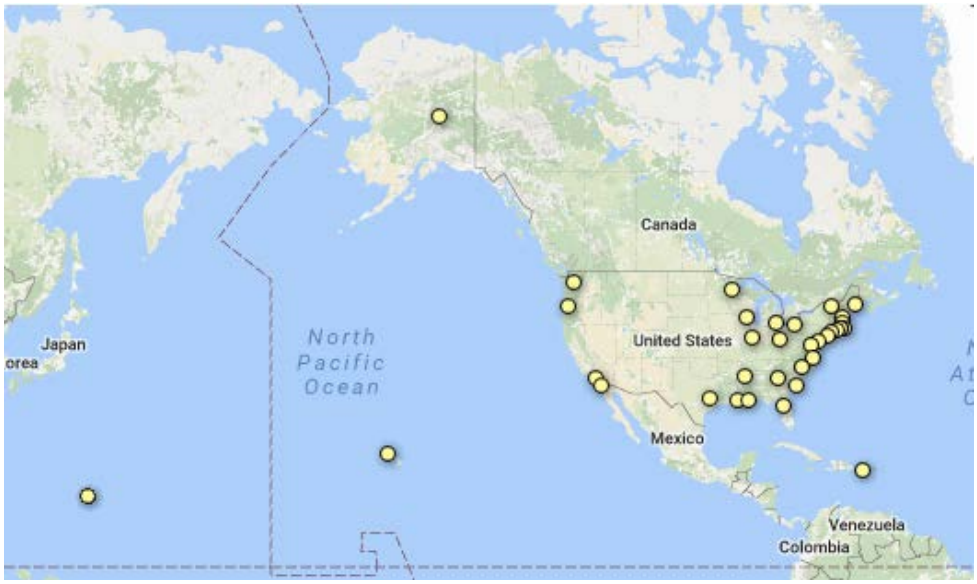
In recent years, there are concerns over the depopulation and aging in local coastal communities which will eventually result in the decline of local industries, including agriculture, forestry and fisheries, along with environmental degradation. The revitalization and further promotion of local communities is a high priority issue for Japan. Despite their importance, there is regrettably a lack of efforts to revitalize the local economy in coastal areas. Regional revitalization and promotion through utilizing the potential of the ocean and coastal areas would be a significant contribution towards regional revitalization objectives of all regions throughout Japan.

Previous efforts to implement industrial development and coastal management in local ocean and coastal areas were made possible through a high-level division of roles by local fisheries experimental stations, related departments of local governments, fishery cooperatives, and other related organizations. However, considering limited budgets of local governments and diversifying needs in coastal communities, it is becoming increasingly necessary to develop a new management system, through comprehensive coordination among the traditionally and newly involved entities.

The Third Basic Plan on Ocean Policy, approved by the Cabinet in May 2018, emphasizes the importance of "collectively mobilizing the wisdom and strength of all the stakeholders including national government agencies, local governments, research and educational institutions, and private sectors." Under these circumstances, we propose close collaboration between the stakeholders led by universities and research institutes which can help to solve issues in coastal areas by providing scientific analysis. Our proposals are based on surveys and case studies on overseas and Japanese examples conducted under the Japan Society of Ocean Policy's project "Toward the Revitalization of Coastal regions by Using the Ocean Policy Approach."

1． Example of Collaboration in the US—Sea Grant Program

In the United States, Sea Grant Programs (SGPs) have been supporting locally rooted marine industries and environmental conservation activities through grants to universities, for about 50 years on a cross-sectoral basis. Thirty-three programs are in place across the United States, including the Great Lakes, Guam, and Puerto Rico.



Sea Grant Programs spreading all over the US (Source: NOAA homepage)

An important characteristic of this approach is that it is based on science. In addition, the major advantages of involving universities include not only that they can utilize specialized knowledge and solutions brought by science, but also that they are able to train and supply human resources indispensable for the activities of various entities in a local community.

Currently, in addition to the contribution of each sea grant program to the local community, the Sea Grant Network, led mainly by the National Oceanic and Atmospheric Administration (NOAA), has been working effectively to advance the sharing of technical skills, joint research development, and the sharing of successful cases and experiences in the arena of promoting marine industry, research and education. These initiatives taken by the network are valued highly. Similar mechanisms have also been introduced in South Korea and Indonesia in recent years, and international collaborations have begun to explore ways to share scientific knowledge and practices.

2. Example of Collaboration in Japan

2.1 Traditional relationship between local communities and universities

The administrative practices of the national and local governments in Japan have traditionally included incorporation of academic expertise in the policy-making process by establishing councils and committees with members from academia. Most of these experts participate as individual experts, and universities as institutions are rarely involved. Thus, there were few cases in which universities took the initiatives to conduct research and studies to solve problems in local communities. In most cases, individual academics provided general expert knowlege. This structure failed to create incentives for universities as a whole to be involved in tackling local issues.

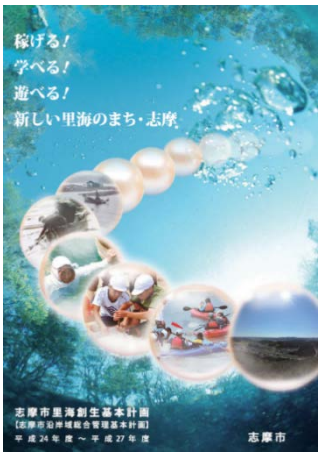
On the other hand, there is an excellent system of prefectural marine experiment stations that has long provided guidance and information to local fishermen in collaboration with fisheries cooperative associations or other local institutions. These stations also contributed to providing data and information on fisheries resources and the environment of local fishing grounds by carrying out surveys and studies for national research institutes, such as the Japan Fisheries Research and Education Agency, and other universities.

However, as issues surrounding ocean and coastal areas expand into environmental conservation and restoration, tourism, recreation, field education, disaster prevention, and renewable energy development, there is a growing need for cross-sectorial coordination that needs to go beyond fisheries, including participation of local residents who are not in fishing industries. The participation of universities as an organization can be a powerful way to respond to these issues. With regard to the utilization of the oceanic and coastal areas by the non-fisheries sector, coordination with fisheries has become a major issue in Japan. We consider that it is useful to make comprehensive efforts to collaborate with the existing fisheries' support system and to make use of the knowledge of universities, including but not limited to fisheries science.

2.2 Examples of partnership between industry, government, community and academia

In our study, we surveyed cases where universities were involved as an organization. We found that successful cases, such as the ones established under the framework of science-based Regionally Intensive Joint Research Projects and other schemes, were able to produce new values that took advantage of local characteristics. For example, a five-year study led by Mie University entitled Project on Environmental Creation in Enclosed Sea Areas that started in 2003 produced sucessful results, including the identification of the current environmental

status of the Ago Bay, the understanding of its environmental deterioration mechanisms, and the reconstruction of tidal flats through collaboration with local residents. In 2012, the Shima City Sato-umi Creation Basic Plan was developed under the slogan "Earn! Learn! Have Fun!— Shima, City of a New Sato-umi." The plan has evolved into an initiative to create "The City of New Sato-umi." [Sato-umi is a conceptual setting of the marine environment and a coastal community where marine resources are utilized wisely and sustainably under the environmental stewardship of the community. *Sato* is the word for rural community and *umi* is the word for the sea in Japanese.]



Shima City Basic Plan for the Creation of Sato-umi (2012, front page)

In order to involve universities as an institution in regional revitalization, funding programs such as the Program for Promoting Regional Revitalization by "Universities as knowledgeable Centers of Community (COC) " of JST, focusing on job creation in the region, are supporting science-based partnerships between industry, government, community and academia. The COCs and other initiatives are expected to promote existing industries and marine and coastal tourism, and develop new marine industries to create jobs in the coastal communities, while maintaining the infrastructure of the economy. Furthermore, as the needs by local residents towards partnership between industry, government, community, and academia grow, local governments' expectations toward universities are increasing; collaboration between local governments and universities is steadily progressing throughout the country.

The aforementioned cases demonstrate the effectiveness and difficulty of implementing collaboration between industry, government, community and academia in the marine and coastal areas. In the case of Shima City, a university played a central role in accumulating scientific evidence and carrying out activities with governments and community residents, while a round-table discussion body was formed and established a formulated plan to sustain such cooperative activities. These efforts will suggest a solution for challenges in implementing industry-academia-private-private collaboration. (The next section elaborates on the factors contributing to the successes and challenges behind such collaboration.)

Furthermore, round-table discussion bodies have been established in Obama City, Fukui Prefecture, and in Bizen City, Okayama Prefecture, which are model sites for the ICM project implemented by the Ocean Policy Research Institute of the Sasakawa Peace Foundation, while, activity bodies formed organically by university students, high school students, junior high school students, and elementary school students have produced significant results.

2.3 Issues with regards to coastal areas

What hinders our efforts include the following. First, science-based partnerships between industry, government, community and academia in the coastal areas require knowledge and experience that covers a wide range of specialized fields significantly different from land-based partnerships. Developing and securing personnel having such expertise is a prerequisite for our efforts. Fortunately, there is at least a part of the base for development of human resource, including marine and fishery high schools nationwide. On the other hand, very few universities have a faculty or department specializing in marine fields. Even if there are researchers specializing in the oceans, they are usually dispersed among many faculties and departments. This point should be taken into consideration when discussing participation of universities. However, even a small number of researchers with oceanic expertise within a university can effectively cooperate in providing support to the coastal areas, if researchers in other specialized fields intend to join an initiative for these areas.

Secondly, issues with regards to coastal areas involve multiple departments of a local government, such as those for industrial promotion, environmental conservation, agriculture and forestry, and fisheries; there is not a single department that handles or coordinates these issues in an integrated manner[1]. In addition, since the oceanic area lacks specified ownership, responsible parties are difficult to be identified. Therefore, diversified stakeholders make coordination and promotion difficult. The participation of the government is also indispensable in regional development, and it is necessary to coordinate the positioning of maritime affairs within the organization of the local government.

Third, access to the ocean requires non-land infrastructure such as ships and ports. Therefore, when carrying out surveys or implementing measures for the maintenance and management of the coastal areas, such as disaster prevention and environmental conservation, a greater cost and labor are required than on land. Fortunately, Japan has invested in the infrastructure necessary for the development of fisheries in local regions. Thus, it is possible to make effective use of at least a part of such investment for our purpose. For example, we can use training ships and research vessels from marine and fisheries high schools, universities, and local governments, although they are sometimes insufficiently equipped. Nevertheless, more cost and labor will need to be invested than in other fields, in order to promote initiatives

1For the national government, a coordination unit was set up in the Cabinet Office in response to the establishment in 2007 of the Basic Act on Ocean Policy. Meanwhile, no local governments have a coordination unit nor a department that covers marine affairs in a unified manner, except for Shima City, which has the Sato-umi Promotion Office.

for marine areas.

As described above, there are challenges that need to be overcome. If ocean tourism and new marine industries are promoted through funding programs such as COC or initiatives recommended in this paper, while creating local jobs and added values, then this will contribute not only to maintaining the infrastructures of the regional economy but also to reducing the management costs of the oceanic and coastal areas. Furthermore, if Japan's vast coastline is usable to create added values by new industries, it will make a valuable source for enhancing Japan's international competitiveness.

Advocating "comprehensive maritime security" as part of the nation’s maritime policy, the Third Basic Plan on Ocean Policy proposes "economic security" and "conservation of the marine environment" as measures to strengthen maritime security. As an example of "economic security," the plan refers to border surveillance by fishermen. It is important from the perspective of maritime policy that projects for coastal areas should be deployed nationwide to develop and maintain local economic infrastructures. These infrastructures will also contribute greatly to the efficient and effective management of Japan's extensive coastline.

3. Proposals for New Partnerships between Industry, Government, Community and Academia

Coastal areas are characterized by diversity and regional differences, which require more cost and labor to coordinate and manage them, in addition to a variety of "expertise" unseen in other areas. With these characteristics in the background, successful cases on cooperation between industry, government, community and academia, such as the one of Shima City, are yet to be developed nationwide. On the other hand, we have pointed out that these efforts are valuable for maritime policy in maintaining local economic infrastructures for the coastal areas. In particular, marine issues have been increasing in diversity and complexity in recent years, and thus it is indispensable to obtain practical technology and collect scientific information. Based on this argument, we present the following three-point proposal for the development and achievement of projects involving science-based partnerships between industry, government, community and academia that are centered on universities and research institutes, which form local hubs of knowledge.

1. Implementation of pilot projects
2. Establishment of a liaison office
3. International collaboration and contribution

(1) Implementation of pilot projects

Universities and research institutes should play a central role in collecting expertise from local governments, relevant research and educational institutions, private businesses, and non-profit private organizations, and develop a system for solving regional issues in the coastal areas.

○Solving regional issues by pilot projects

In pilot projects, a science-based approach should be established to address oceanic and coastal issues. More specifically, science-based solutions should be provided to new needs for, and issues of, the coastal areas, such as marine tourism, new marine industries, environmental conservation and mitigation, and management of remote islands. In addition, the pilot project should seek to create and develop regionally suitable values. Under the pilot project, projects including dissemination and enlightenment* should be systematically implemented in the coastal area, and regional economic effects[2] and marine policy effects in the region should be evaluated*. In addition, the pilot project should clarify the needs for sustainable projects to be deployed in coastal areas nationwide.

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2 According to the Sea Grant program in the United States, it is estimated that the annual budget of the Federal Government around 68 million dollars in 2015, creating an economic value of about 8.5 times.

* In addition to solution of issues with coastal areas, those projects are expected also to focus on developing human resources, enhancing the understanding of marine issues by community residents and regional industries, and disseminating relevant information. Under such projects, science-based initiatives should be taken, including the comprehensive collection and management of information on the region's ocean and relevant issues; such information should be communicated to interested parties in an easy-to-understand manner to promote research and educational activities within the region.

○Constructing and enhancing cross-sectoral networks within a region

Under a pilot project, a cross-sectoral network should be built to unify collaboration between marine administrations, facilities (e.g. aquariums), industries, educational institutions, research institutions, NGOs, and private action groups within the region, led by universities and research institutions[3].

In the network, a department responsible for regional cooperation, or a regional office, should be established within universities or research institutes. Historically, Japan has in place a well-functioning framework of prefectural fisheries experimental stations, fisheries departments of universities, and research institutes for the purpose of promoting regional fisheries activities. In light of these circumstances, Japan should strengthen such cooperation systems to make the best use of regional characteristics.

○Roles of a regional office and evaluation of the regional project

In a pilot project, three types of entities are expected to make the core of the network: "universities with faculties and departments that provide a major in marine sciences", "universities that provide an inter-faculty program for marine affairs," and "research institutes for marine science or for marine technology development." In addition, each regional office should consist of management persons, promotion coordinators, full-time faculty members and researchers, and representatives dispatched from local governments. The office should promote cooperation with researchers participating in the project, and should conduct internal assessments of the overall progress of the project. In addition, an external evaluation committee consisting of third parties should be established.

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3 These initiatives include a program of the Research Center for Integrated Ocean and Coastal Management Studies at Yokohama National University (ended in FY 2017) and another by the Ocean Alliance of the University of Tokyo. Pilot projects may involve multiple key players: (1) universities, (2) marine experimental and research institute, (3) local government, (4) local enterprises, (5) NPOs and other private organizations oriented toward regional revitalization, (6) high schools, including marine and fishery high schools, (7) general primary and secondary schools, (8) social education facilities related to the ocean (e.g. aquariums, museums), and (9) academic organizations.

The achievements of pilot projects should be deployed by an organized network coordinating these regional offices nationwide with the liaison offices as described later.

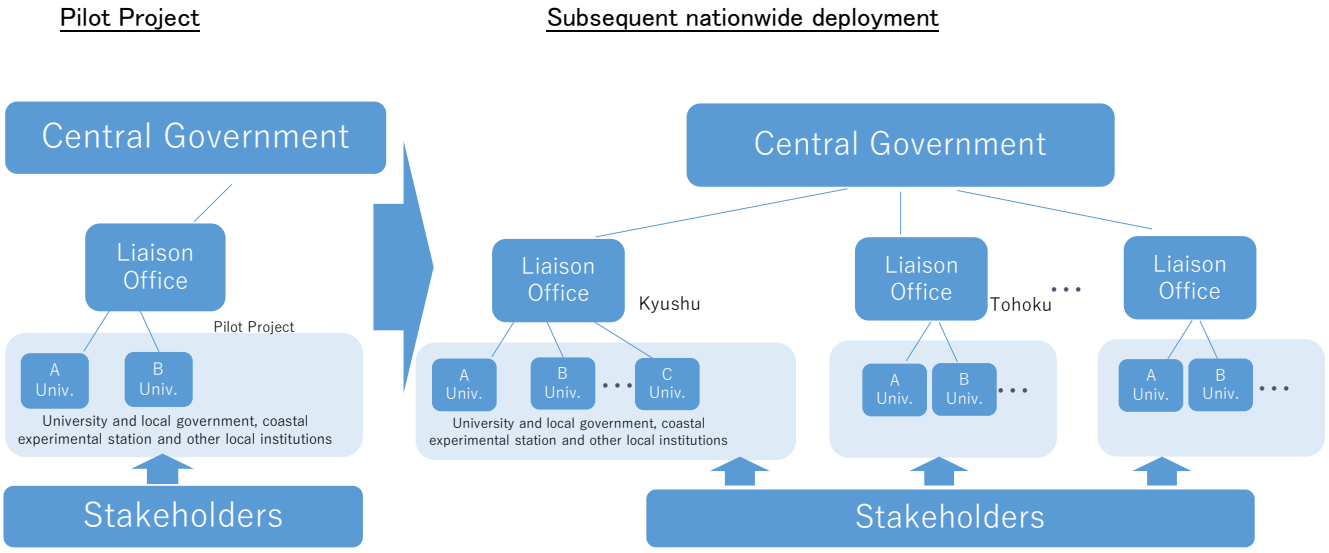


Image of pilot projects deployed

(2) Establishment of a liaison office

We propose the establishment of liaison offices in several regions around the country, following the implementation of the pilot project. These liaison offices should serve as an operation center with the aim of introducing successful cases nationwide by linking regional offices, sharing know-how, technology, and experience, and fostering human resources. The liaison offices should carry out the following activities:

○Supporting planning and evaluation in regions

As an operation center, the liaison office should identify the current situation in each region (e.g. latest information and problems) and coordinate efforts of stakeholders.

○Fostering human resources to form the basis for regional development

(e.g. training of coordinators, acquisition of basic marine skills, improvement of communication skills)

In addition, liaison offices nationwide should collaborate on the following matters:

○Identifying local resources, creating and sharing a database of best practices in the region (including disaster countermeasures and other initiatives), and actively carrying out advisory

activities
(e.g. mutually understanding program development, making collaboration more efficient, and supporting the establishment of regional discussion bodies)
○Collecting information on coastal areas (including connected river areas) and disseminating research results
○Fostering personnel capable of promoting cooperation between stakeholders and working internationally in a long time-scale , utilizing a fellowship system
○Providing a standard marine education curricula, disseminating technologies for monitoring and other purposes, and dispatching experts

(3) International collaboration and contribution

The US Sea Grant Programs seek to build a global network with the goal of sharing experience and activity models with the rest of the world. The Sea Partnership Program (SPP) of Indonesia and the Sea Grant Program of Korea (KSGP) were launched, and these programs were to promote international joint research and marine education through frequent mutual visits. We propose that Japan should actively collaborate with these programs to contribute to international efforts by disseminating results and sharing experiences.

Immediate actions against global warming and marine crises have been urged repeatedly by the 2015 Paris Agreement, the Sustainable Development Goals (SDGs) set out in the UN 2030 Agenda, and the 2017 UN Ocean Conference. In addition to conventional regulations, a framework was developed to require national governments and organizations to present their own targets as a Nationally Determined Contributions (NDCs) under the Paris Agreement or as a Voluntary Commitment under the UN Ocean Conference. The function of the framework also includes verification of those targets.

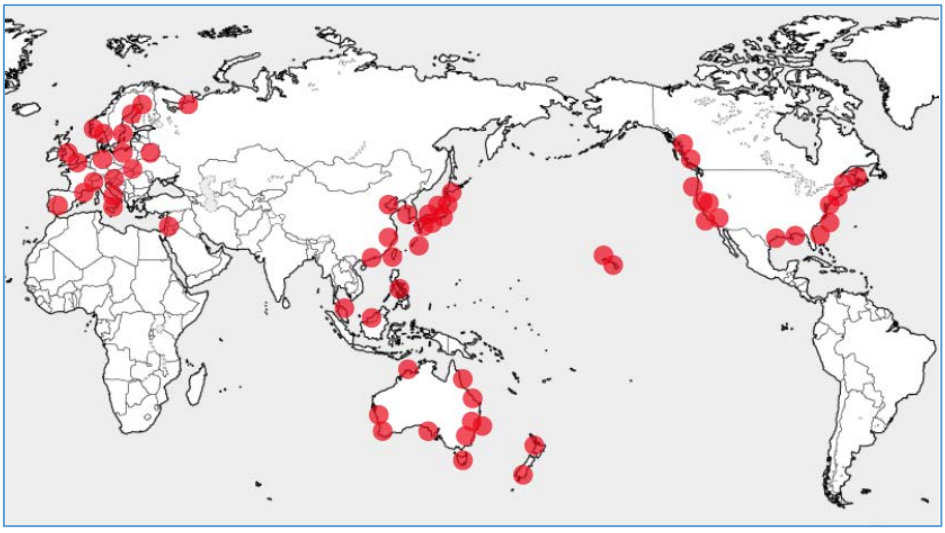
We do not have universally applicable solutions regarding these goals and we should establish the goals through coordination with interested parties to find the best solution. The effectiveness of goals would not be ensured if they are set up in a top-down process by the central government. Alternatively, as in the case of a Sea Grant Program, goals can be developed and verified through regional activities and discussions in a bottom-up process.

Japan is expected to address emerging oceanic and coastal issues, including global warming and marine crises, and in accordance with efforts in other nations, the national goals should be set on a regional basis. The outcome of the proposed projects and the experience obtained from them will significantly contribute to the future efforts of developing countries in the Asia-Pacific region, which have natural environments and social conditions similar to those of Japan.

The Third Basic Plan on Ocean Policy refers to examples of actions to strengthen

comprehensive maritime security, in measures regarding "the conservation of the marine environment," in conjunction with the measures regarding "economic security" as mentioned above. The plan states that reducing the impact of natural disasters in other countries by sharing data collected by Japan on climate change and other challenges will create a desirable security environment for Japan. Japan's efforts to resolve new issues with coastal areas will enhance the value of its maritime policy, by contributing to the international community. In addition to the expansion of local economic infrastructures through industrial promotion, it is desired that local governments will create more values by promoting efforts to address climate change and other emerging challenges.

The 2030 Agenda set Sustainable Development Goal 14 (SDG14) with a focus on "the conservation and sustainable use of oceans and marine resources." In response, Japan's Third Basic Plan on Ocean Policy pointed out that there is growing global recognition of the need for enhancing scientific knowledge based on marine observation. Furthermore, at its general assembly held in December 2017, the United Nations proclaimed a Decade of Ocean Science for Sustainable Development (2021-2030). These international initiatives will contribute sufficiently to "increasing scientific knowledge, developing research capacity, and transferring marine technology," which is specifically targeted in SDG 14(a). These initiatives are highly compatible with Japan's Third Basic Plan on Ocean Policy, which states that Japan will work to disseminate the "rule of law at sea" and "implementation of policies based on scientific knowledge," as universal standards of the international community.



Coastal laboratories around the world

Universities and research institutes are expected to play a key role in forming international coordination in initiatives focuses on the coastal areas.

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