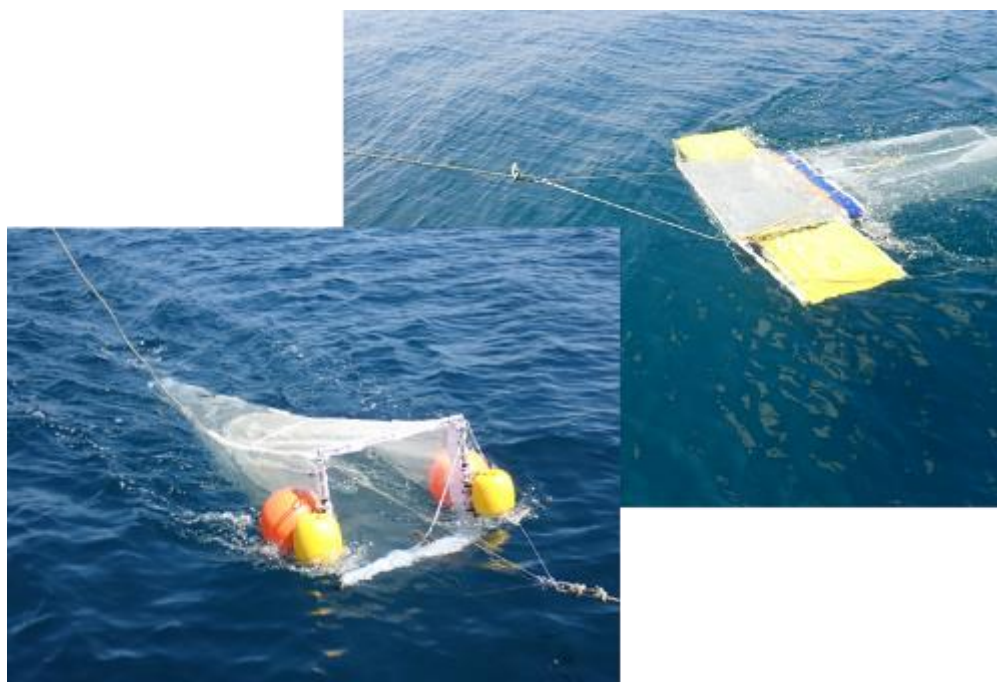




Workshop Report

G20 workshop on harmonized monitoring and data compilation of marine plastic litter



September 7, 2020, Online
Ministry of the Environment, Japan

Contents

1 Executive summary of the G20 Workshop	1
2 Background and purposes	2
3 Outline of the workshop	2
4 Presentations.....	3
4.1 Opening remarks	3
4.2 Session 1: Significance of harmonized monitoring and data compilation	4
4.3 General comment by Jane NISHIDA, Principal Deputy Assistant Administrator, Office of International and Tribal Affairs, U.S. Environmental Protection Agency	5
4.4 Session 2: Promoting harmonized monitoring and data sharing around the world	6
4.5 Closing	8
 Annex 1: Agenda	 8
Annex 2: Agenda	10

List of acronyms and abbreviations

GESAMP: The Joint Group of Experts on the Scientific Aspects of Marine
Environmental Protection

IOC-UNESCO: The Intergovernmental Oceanographic Commission of UNESCO

IODE: International Oceanographic Data and Information Exchange

JAMSTEC: Japan Agency for Marine-Earth Science and Technology

MOEJ: The Ministry of the Environment, JAPAN

SDGs: Sustainable Development Goals

1 Executive summary of the G20 Workshop

The following key issues were discussed at this workshop:

1. Harmonized monitoring and data sharing on marine plastic litter and microplastics should, among other things, contribute to the SDGs and Long-Term Vision.
2. Monitoring for marine plastic litter and microplastics can have various purposes including:
 - a) Understanding the current status of the form of pollution,
 - b) Estimating its negative impacts on biota,
 - c) Identifying its sources and hotspots,
 - d) Predicting occurrences of the pollution,
 - e) Developing measures and verifying their effectiveness,
 - f) Establishing targets and milestones for reducing marine plastic litter and microplastics, and
 - g) Promoting public awareness and environmental education
3. Harmonization of the monitoring methods is important for producing and sharing comparable data for scientific evaluations.
4. Each country and organization should share and promote the outcomes of initiatives for harmonizing monitoring methods that have been created by the United Nations Environmental Programme (UNEP), Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP), IOC Sub-Commission for the Western Pacific (WESTPAC), Joint Research Center on European Commission (JRC), and EU Marine Strategy Framework Directive (MSFD), in addition to initiatives originating in Japan.
5. G20 members are expected to enhance their capacity development activities beyond the G20 member states. This may result in not only increased volumes of harmonized monitoring data but also acceleration of effective countermeasures at the national, regional and global levels.
6. More scientific communities and policy-makers are expected to build a network beyond regional boundaries to accumulate knowledge on harmonized monitoring and data sharing.
7. Some presenters introduced the existing monitoring databases, and MOEJ proposed a project to share monitoring data. Each country and organization is expected to cooperate in promoting data sharing, fully taking into account existing international initiatives toward a globally harmonized data system.
8. Scientific communities are expected to create and maintain an approachable, robust and extensible set of common and best practices to promote and enable global coordination across scales, sectors and capacities.

9. Sharing of monitoring data globally should be promoted while paying attention to:
 - a) applying FAIR (findable, accessible, interoperable and reusable) principles,
 - b) collaborating with existing initiatives including, but not limited to, sharing digital resources,
 - c) establishing a sustained digital data ecosystem, and
 - d) facilitating contributions from a wide range of stakeholders, including those in low-technology environments
10. Appropriate international organizations are expected to take action for data sharing under initiatives including UNEA resolution 4/6 and the UN-Decade of Ocean Science for Sustainable Development.
11. To realize harmonization of monitoring and data sharing will require step-by-step approaches with attention to big challenges and urgent issues. This kind of workshop should be held regularly to solve technical and other issues.

2 Background and purposes

The G20 workshop on harmonized monitoring and data compilation of marine plastic litter, which was hosted by the Ministry of the Environment, Japan (MOEJ) and supported by the Ministry of Environment, Water & Agriculture of the Kingdom of Saudi Arabia (holder of the G20 Presidency this year), was held online on September 7, 2020.

As set out by the “G20 Action Plan on Marine Litter,” adopted at the G20 Hamburg Summit 2017, the G20 Implementation Framework for Actions on Marine Litter established at the Ministerial Meeting on Energy Transitions and Global Environment for Sustainable Growth in 2019 called for promoting harmonized monitoring methods. A follow-up meeting of the Implementation Framework held in October 2019 identified required activities, including an initiative by MOEJ to voluntarily take the lead in harmonizing monitoring and data compilation.

This workshop was held as a subsequent step to discuss and share the importance of globally harmonized monitoring methods and compiled monitoring data and of promoting a worldwide network for harmonization and data sharing on marine plastic litter.

3 Outline of the workshop

The workshop agenda is provided in Annex 1. The workshop consisted of two main sessions:

- Session 1: Significance of harmonized monitoring and data compilation
- Session 2: Promoting harmonized monitoring and data sharing around the world

Approximately 160 people from 31 countries sharing the “Osaka Blue Ocean Vision” participated in the workshop, including G20 members, other countries and regions, and

six international organizations and institutions.

4 Presentations

The workshop was facilitated by Dr. MICHIDA Yutaka, a professor at the University of Tokyo. He expressed appreciation for the constructive and substantial contributions of the participants, especially the 12 presenters from G20 countries and international organizations.

4.1 Opening remarks

4.1.1 Welcome message by KOIZUMI Shinjiro, Minister of the Environment, Japan

Mr. Koizumi emphasized that Japan will take recovery from the coronavirus pandemic as an opportunity to redesign its socioeconomic system. He introduced domestic measures including a charge for plastic bags and a resource circulation strategy. He then mentioned that Japan leads international harmonization of monitoring methods and data compilation, and that Japan is cooperating with South Asian countries on measures against marine plastic litter. Finally, he expressed his positive expectations for the workshop.

4.1.2 Keynote speech by Osama FAQEEHA, Deputy Minister for Environment, Saudi Arabia

Dr. Fageeha pointed out that marine plastic litter has caused various problems. He expressed appreciation to Japan for its hosting of this workshop as holder of the G20 Presidency last year, as Japan has been leading the world in measures against marine litter. He also stated that Saudi Arabia will focus on marine litter as the G20 Presidency holder this year.

4.1.3 Keynote speech by TAKEMOTO Kazuhiko, Project Professor, University of Tokyo

Dr. Takemoto introduced the Sustainable Development Goals (SDGs) on marine debris and provided an overview of the efforts to achieve them, including the Osaka Blue Ocean Vision. He emphasized the importance of developing monitoring methods and databases by the international community to realize science-based measures, and that it is essential for multiple stakeholders to participate.

4.1.4 Introduction by NAKASHIMA Keiji, Director, Office of Policies against Marine Plastic Pollution, Ministry of the Environment, Japan

Mr. Nakashima explained the SDGs and the Osaka Blue Ocean Vision as global goals against marine litter and described the background of this workshop, including the G20 Osaka Summit. He also introduced the "Guidelines for Harmonization of Sea Surface Microplastic Monitoring Methods" published by MOEJ last year.

4.2 Session 1: Significance of harmonized monitoring and data compilation

4.2.1 Presentation by Peter KERSHAW, WG40 Co-Chair, Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP)

Dr. Kershaw pointed out the significance of monitoring and data compilation in addressing marine plastic litter and microplastic pollution. He emphasized the need to promote harmonization of monitoring methods, quoting a passage from President Lincoln: *"If we could first know where we are, and whither we are tending, we could better judge what to do, and how to do it."* He introduced GESAMP's guidelines and other efforts for harmonization.

One participant asked Dr. Kershaw, "We have been conducting our monitoring for many years. Should we switch to a new monitoring method?" Dr. Kershaw replied, "Long-term monitoring is valuable, so you should continue it. You should rather try to find a way to compare your data with other monitoring results. Harmonized monitoring methods are for those planning to start their monitoring. "

4.2.2 Presentation by Heidi SAVELLI-SODERBERG, Programme Officer, Marine Litter Global Programme of Action, Ecosystem Division, United Nations Environment Programme (UNEP)

Ms. Savelli-Soderberg explained how UNEP started to work on marine litter in response to UNEA resolution 4/6, and introduced UNEP's current activities addressing marine litter.

4.2.3 Presentation by Sergey BELOV, Co-Chair, International Oceanographic Data and Information Exchange (IODE), Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO)

Dr. Belov introduced the IOC Ocean Data and Information System (ODIS) and Ocean Best Practices System (OBPS), including guidelines for harmonizing monitoring methods and guidelines for gathering microlitter datasets. He called for global efforts to create and maintain an approachable, robust and extensible set of common and best practices to promote and enable global coordination across scales, sectors and capacities, with cooperative activities under the UN Decade and SDGs.

4.2.4 Presentation by ISOBE Atsuhiko, Professor, Kyushu University

Professor Isobe touched on the negative impacts of microplastics on marine organisms suggested by laboratory experiments, and microplastic abundance after 50 years predicted by a numerical simulation. He pointed out the need for an observation network using a harmonized protocol for microplastic surveys, and a framework of international data centers for marine plastic litter.

4.2.5 Presentation by Muhammad Reza CORDOVA, Research Scientist,

Indonesian Institute of Sciences, Indonesia

Dr. Cordova introduced the Indonesian government's action plan against marine litter which achieved its target for plastic waste reduction (70% by 2025) at sea. He reported on the current status of marine litter and its monitoring in the country, as an effort to promote and implement citizen science. He pointed out the need for harmonization of monitoring methods in Indonesia regarding scientific evidence such as debris hotspots and prediction of marine litter numbers and movement.

4.2.6 Panel discussion I

The organizer sent the following questions in advance to the speakers for the panel discussion. Due to time constraints, however, each speaker provided a short comment instead.

Q1- What are the purposes of harmonizing monitoring methods and data compilation at the global level?

Q2- What initiatives are there for harmonizing monitoring methods at the national / regional / global level?

Q3- What is your expectation for global monitoring data sharing?

Comments from the speakers were as follows;

- Dr. Kershaw
We need to keep SDG 14.4.1 in mind. Long-term monitoring is required.
- Ms. Savelli-Soderberg
It is important to contribute to measures (e.g., action plans and goals) against the inflow of litter into the sea. Monitoring data should be published for easy access by end-users of scientific knowledge.
- Dr. Belov
Data in global warehouses are important. For the initiative to harmonize monitoring methods, it is not appropriate to identify a single initiative as the best one. It is rather necessary to support all of the various initiatives continuously.
- Prof. Isobe
Mathematical models should be used for future forecasts toward the formulation of action plans, but baseline monitoring is required for this. Joint surveys with other countries would be effective for harmonization. We need to create an “Open Dataset.”
- Dr. Cordova
It is important to monitor the current status for identification of countermeasures. Existing open data should be utilized.

4.3 General comment by Jane NISHIDA, Principal Deputy Assistant Administrator,

Office of International and Tribal Affairs, U.S. Environmental Protection Agency
Ms. Nishida pointed out that it is important to monitor marine debris for policy-making and assessment of the effectiveness of policies. She introduced efforts by the U.S. federal government, especially the National Oceanic and Atmospheric Administration (NOAA) such as Marine Debris Monitoring Toolkits for Educators. She also mentioned U.S. cooperation with the Asia Pacific Economic Cooperation (APEC) Oceans and Fisheries Working Group.

4.4 Session 2: Promoting harmonized monitoring and data sharing around the world

4.4.1 Presentation by Alessandra GIORGETTI, Coordinator of the European Marine Observation and Data Network (EMODnet) Chemistry, EU

Dr. Giorgetti described the EU's efforts to monitor marine pollution for policy-making, focusing on the Marine Strategy Framework Directive (Marine Strategy Framework Directive) in collaboration with the Joint Research Center on European Commission (JRC). She also introduced the marine litter database operated by the EU, anticipating a possible link between the G20 platform for global assessment and the Japanese approach.

4.4.2 Presentation by LI Daoji, Professor, Director of Ocean Plastics Research Center, East China Normal University

Prof. Li described the global efforts to harmonize monitoring methods, and responses of the IOC Sub-Commission for the Western Pacific (WESTPAC), such as guidelines and developing a regional center, and the Northwest Pacific Action Plan (NOWPAP) established by China, Japan, Korea and Russia. He also introduced China's efforts, including a national key research and development program, China-Japan joint surveys and China-Norway joint research.

4.4.3 Presentation by CHIBA Sanae, Group Leader, Japan Agency for Marine-Earth Science and Technology

Dr. Chiba introduced JAMSTEC's Deep-Sea Debris Database. She explained the requirements for a globally integrated marine debris observation system, with standards based on the FAIR (findable, accessible, interoperable and reusable) principle, and the needs for integrated cooperation involving ocean scientists, the public and private sectors, and decision makers.

4.4.4 Presentation by ABE Tatsuya, Deputy Director, Office of Policies against Marine Plastic Pollution, Ministry of the Environment, Japan

Mr. Abe introduced the activities of MOEJ for harmonization of monitoring methods for marine plastic litter, which are based on scientific surveys and analyses of the use of different analytical and monitoring methods for statistical comparison, in collaboration with many global experts. He then proposed a data sharing project to create a global

network hub for sharing and compiling monitoring activities, in collaboration with existing and future initiatives.

4.4.5 Panel discussion II

The organizer sent the following questions in advance to the speakers for their panel discussion. Due to time constraints, however, each speaker provided a short comment instead.

Q1- What challenges do you face in networking to harmonize monitoring methods and data compilation at the global level?

Q2- What are your recommendations for a global monitoring data sharing system?

Q3- What role would G20 Members and international organizations play in facilitating data sharing?

The speakers gave the following comments;

- Dr. Giorgetti

It is important to share the existing standards and practices for creating a network to harmonize monitoring methods. A global system to share monitoring data should be operated over a long period, and all stakeholders should be involved in the discussion to create it. In the EU, a technical group was set up with researchers and government officials to discuss data sharing.

- Prof. Li

A group of researchers should be organized to discuss an integrated monitoring method, including its cost. We need to assist capacity building in countries where monitoring of marine litter has just started or is about to start.

- Dr. Chiba

It is necessary to prioritize what should be measured. Criteria for such prioritization would be: (1) whether it was a significant issue or not; and, (2) whether it was feasible or not in terms of cost-effectiveness and practicability. Developing a global system to share monitoring data requires a dialogue between database designers. The G20 needs to provide support for data sharing, including financial assistance, over a long period.

- Mr. Abe

Development of a global system to share monitoring data requires continuous communications between researchers and government officials. The G20 should continue its efforts.

4.5 Closing

4.5.1 Chair's Summary of the Workshop by MICHIDA Yutaka, Professor, University of Tokyo

Prof. Michida presented the outline of the draft executive summary:

- Noted various purposes of monitoring the distribution of marine plastic litter and microplastics
- Recognized the importance of harmonizing the monitoring methods for producing and sharing comparable data for scientific evaluations
- Anticipated scientific communities creating networks, and knowledge from them accumulating
- Recommended that each country and organization share the outcomes of their initiatives for harmonizing monitoring methods and cooperate with each other for further harmonization
- Recommended promoting the worldwide sharing of monitoring data
- Expressed the desire that appropriate international organizations would create initiatives for data sharing

The chair concluded that this workshop was the first step towards a data sharing system on marine plastic litter and that cooperation with the participants and organizations involved was essential in solving this problem.

4.5.2 Closing remarks by Dr. Osama FAQEEHA, Deputy Minister for Environment, Saudi Arabia

Dr. Faqeeha expressed his appreciation to all speakers, participants and MOEJ and also to Japan as the G20 Presidency holder for 2019. He declared that Saudi Arabia, as the G20 Presidency holder for 2020, will continue to combat marine litter. He also expressed his hope for contribution of this workshop to the protection of the oceans.

Annex 1: Agenda

Time	Topic and speaker
20:00~20:30(JST)	<u>Opening remarks</u>
11:00~11:30(UTC)	Welcome message <ul style="list-style-type: none">● <i>KOIZUMI Shinjiro, Minister of the Environment, Japan</i>
	Keynote speech <ul style="list-style-type: none">● <i>Osama FAQEEHA, Deputy Minister for Environment, Saudi Arabia</i>● <u>TAKEMOTO Kazuhiko, Project Professor, University of Tokyo</u>
	Introduction <ul style="list-style-type: none">● <u>NAKASHIMA Keiji, Director, Office of Policies against Marine Plastic pollution, Ministry of the Environment, Japan</u>

Time	Topic and speaker
20:30~21:50(JST) 11:30~12:50(UTC)	<p><u>Significance of harmonized monitoring and data compilation</u></p> <ul style="list-style-type: none"> ● <u>Peter KERSHAW, WG40 Co-Chair, the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP)</u> ● <u>Heidi SAVELLI-SODERBERG, Programme Officer, Marine Litter Global Programme of Action, Ecosystem Division, United Nations Environment Programme (UNEP)</u> ● <u>Sergey BELOV, Co-Chair, International Oceanographic Data and Information Exchange (IODE), The Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO)</u> ● <u>ISOBE Atsuhiko, Professor, Kyusyu University</u> ● <u>Muhammad Reza CORDOVA, Research Scientist, Indonesian Institute of Sciences, Indonesia</u> <p>Panel discussion I</p>
21:50~22:00(JST) 12:50~13:00(UTC)	<p><u>General comment</u></p> <ul style="list-style-type: none"> ● <u>Jane NISHIDA, Principal Deputy Assistant Administrator, Office of International and Tribal Affairs, U.S. Environmental Protection Agency</u>
22:00~23:10(JST) 13:00~14:10(UTC)	<p><u>Promoting harmonized monitoring and data sharing around the world</u></p> <ul style="list-style-type: none"> ● <u>Alessandra GIORGETTI, Coordinator of the European Marine Observation and Data Network (EMODnet) Chemistry, the EU</u> ● <u>LI Daoji, Professor, Director of Ocean Plastics Research Center, East China Normal University</u> ● <u>CHIBA Sanae, Group Leader, Japan Agency for Marine-Earth Science and Technology</u> ● <u>ABE Tatsuya, Deputy Director, Office of Policies against Marine Plastic pollution, Ministry of the Environment, Japan</u> <p>Panel discussion II</p>
23:10~23:20(JST) 14:10~14:20(UTC)	<p><u>Closing</u></p> <p>Chair's Summary of the Workshop</p> <ul style="list-style-type: none"> ● <u>MICHIDA Yutaka, Professor, University of Tokyo (Chair)</u> <p>Closing</p> <ul style="list-style-type: none"> ● <u>Osama FAQEEHA, Deputy Minister for Environment, Saudi Arabia</u>

Annex 2: Presentation materials

Materials presented at the workshop are posted on the following web page:

<https://g20mpl.org/archives/893>

(1) Keynote speech by TAKEMOTO Kazuhiko, the University of Tokyo

The G20 Workshop on
harmonized monitoring and data compilation of marine plastic litter

**Science based Policy
towards Achieving the Global Goals**

September 7, 2020

TAKEMOTO Kazuhiko
The University of Tokyo

Contents

- 1.The 2030 Agenda and SDGs
- 2.Global Goals and Targets on Marine Plastic Litter
- 3.Evidence based Actions to Address Global Goals

1. The 2030 Agenda and SDGs

The 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs)

- Replaced Millennium Development Goals (MDGs) (2000-2015)
- Adopted at the UN Summit in Sep. 2015
- SDGs: 17 Goals, 169 Targets and 232 indicators
- Global goals that apply to both developed and developing countries
- Basic Concept: "Transforming our world" "No one will be left behind"

UN Photo/Toyah Felix
United Nations Sustainable Development Summit 2015, 9-27 September 2015, UN Headquarters, New York

Characteristics of the SDGs

- Back-casting approach
SDGs specifies goals and targets, requiring back-casting approach
- Integrated approach
The 2030 Agenda focuses on integrated approach, covering three pillars of sustainable development. Interlinkages among goals are important for its realization

The 17 Sustainable Development Goals and 169 targets ... They are integrated and indivisible and balance the three dimensions of sustainable development: the economic, social and environmental

Importance of multi-stakeholder partnership

Inclusive Research on Integrated Implementation Methodology Towards Achievement of SDGs

©The research is supported by the Environment Research and Technology Development Fund (J-SP-2002) of the Environmental Restoration and Conservation Agency, Japan

Sub theme 1 : Establishment of assessment indicators
(National Institute for Environmental Studies, Japan)

Development of indicators with a view to the post-2020 Basic Environment Plan

- Indicators reflecting on existing indicators
- The selection of integrated indicators using SDGs (social, economic and environmental aspects)
- Investigation in effectiveness and meaning of indicators

Integrated Implementation and actions with assessment indicators

Sub theme 2 : Government and SDGs
(United Nations University, Institute for the Advanced Study of Sustainability)

Research on governance for achievement of SDGs at national level (cross-national comparison of administrative systems at central governments)
Case studies of Japanese local governments towards achievement of SDGs at sub-national level

Sub theme 3 : Private sectors and SDGs
(Wale University)

Effective SDGs Implementation and development of assessment methods for private sectors activities
Creation of new private governance and measurement through SDGs, based on analysis of consistent activities for multiple targets (cooperation with private companies), Environment and SDGs

2. Global Goals and Targets on Marine Plastic Litter

2-1: SDG 12 and 14

Goal 12: Ensure sustainable consumption and production patterns

12.2 By 2030, achieve **the sustainable management and efficient use of natural resources**

12.4 By 2020, **achieve the environmentally sound management of chemicals and all wastes** throughout their life cycle, in accordance with agreed international frameworks, and **significantly reduce their release to air, water and soil** in order to minimize their adverse impacts on human health and the environment

12.5 By 2030, **substantially reduce waste generation through prevention, reduction, recycling and reuse**

Goal 14: Conserve and sustainably use the oceans, seas and marine resources

14.1 **By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution**

14.2 **By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans**

2-2: G20 "Osaka Blue Ocean Vision" (June, 2019)

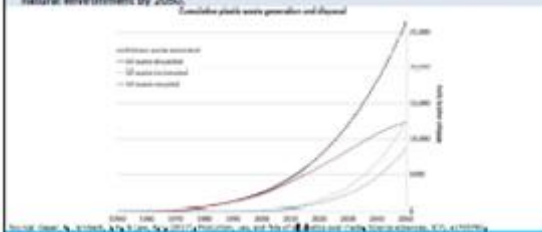


- G20 leaders shared the "Osaka Blue Ocean Vision" in 2019
- 86 countries and regions have already shared the vision beyond the G20 members

39. We share, and call on other members of the international community to also share, as a common global vision, the "Osaka Blue Ocean Vision" that we aim to **reduce additional pollution by marine plastic litter to zero by 2050 through a comprehensive life-cycle approach** that includes reducing the discharge of mismanaged plastic litter by improve waste management and innovative solutions while recognizing the important role of plastics for society.

3. Evidence Based Actions to Address Global Goals 3-1: World Plastic Production and Waste

- Plastics produced after 1950 exceeded 8.3 billion metric tons, and 6.3 billion metric tons were discarded as waste
- 79% of the collected plastic waste is landfilled or dumped in the ocean, etc.
- Only 9% of plastic is recycled
- If current trends continue, 12 billion metric tons of plastic waste will be in landfills or in the natural environment by 2050.



3-2: Sustainable Consumption and Production (SCP)

- ✓ Call for the development of a 10-year framework of programmes in 2002 at Johannesburg Summit
- ✓ The Marrakech Process (2003)
- ✓ 10-year Framework of Programmes (10YFP) on sustainable consumption and production (SCP) adopted at Rio+20 in 2012
- ✓ UNEP International Resource Panel: IRP

Call for collective measures through multi-stakeholders and partnerships to promote SCP policies and initiatives

Source: <https://www.unep.org/10yfp/10yfp-framework/10yfp-framework>

3-3: Indicator for Marine Plastic Litter (SDG14)

- ✓ The United Nations Statistical Commission has developed Tier Classification for Global SDG Indicators. Among them, indicator on Marine Plastic Litter (14.1.1) is classified as Tier 3 with no internationally established methodologies yet.
- ✓ UNEP is covering metadata on Marine Plastic Litter, including SDGs indicators related to Target 14.1.

Target 14.1

By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution

Global Indicator 14.1.1

Index of coastal eutrophication (ICEP) and **floating plastic debris density**
Indicator for which internationally agreed definition nor computation method has not been released by United Nations so far (Tier 3).

The Classification Criteria/Methodology: The 14.1.1 indicator is conceptually clear, but no internationally established methodologies and standards in scientific and data are regularly produced by countries for an SDG indicator of coastal eutrophication in water bodies where the indicator is relevant. The 14.1.1 indicator is conceptually clear, but no internationally established methodologies and standards in scientific and data are regularly produced by countries. The 14.1.1 indicator is conceptually clear, but no internationally established methodologies and standards in scientific and data are regularly produced by countries.

3-4: 4th United Nations Environment Assembly (UNEA4)

Ministerial Declaration of the 2019 United Nations Environment Assembly "innovative solutions for environmental challenges and sustainable consumption and production"

We "decide, taking into account our national circumstances, to take the following actions:"

- "We will support global efforts to develop sustainable products and services and we encourage to set ambitious national goals on the use of sustainable procurements to stimulate demand for environmentally sound products, processes and services"
- "We will improve national environmental monitoring systems and technologies including for air, water and soil quality, biodiversity, marine litter, chemicals and waste, and we encourage the development of national environmental data management capacities"

Resolution 4/6 on "Marine Plastic Litter and Microplastics" (Overview)

- Request for immediate **strengthening of scientific and technological knowledge** with regard to marine litter including marine plastic litter and microplastics.
- Decision to strengthen coordination and cooperation through a **multi-stakeholder platform** within UNEP, to take immediate action towards the long-term elimination of litter and microplastic discharges into the oceans through a life-cycle approach.
- Decision to extend until UNEA-5 the mandate of the Ad Hoc Open-Ended Expert Group on Marine Litter and Microplastics.

3-5: High-Level Political Forum 2019

The 2030 Agenda for Sustainable Development

Para 57. We recognize that baseline data for several of the targets remains unavailable, and we call for increased support for **strengthening data collection and capacity-building** in Member States, to develop national and global baselines where they do not yet exist. We commit to addressing this gap in data collection so as to better inform the measurement of progress, in particular for those targets below which do not have clear numerical targets.

The High-Level Political Forum on Sustainable Development (HLPF)

- Role: The main UN platform on sustainable development / central role in the follow-up and review of the 2030 Agenda for Sustainable Development the Sustainable Development Goals (SDGs) at the global level
- SDG Summit 2019 adopted Political Declaration, "**Gearing up for a decade of action and delivery for sustainable development**", consisting of I Our Commitment, II Our world today, and III Our call to accelerated action.



UN Plastic
UN SDG Summit 2019

Summary

1. Global goals and targets on marine plastic litter have been developed through high-level political debates at the UN (for SDGs) and G20 (for Osaka Blue Ocean Vision).
2. Toward achieving global goals, it is essential for the international community to develop monitoring methodologies & database and to enhance multi-stakeholders' participation.

(2) Introduction by NAKASHIMA Keiji, MOEJ

The G20 Workshop on
harmonized monitoring and data compilation of marine plastic litter

Background and Japan's Practices

September, 2020
NAKASHIMA Keiji
Ministry of the Environment, Japan

2. G20 Osaka Summit



• The G20 leaders shared a common global vision in June, 2019

We aim to reduce the additional pollution by marine plastic litter to zero by 2050 through a comprehensive life-cycle approach. (Osaka Blue Ocean Vision)

• 86 countries and regions have already shared the vision

4-1. Guidelines for Harmonizing Ocean Surface Microplastic Monitoring Methods

- The international expert meetings have been held in 2016, 2018, 2019 and 2020.
- Researchers from all over the world participated.

Author name	Country	Author name	Country
Chavanich, S.	Thailand	Mason, S.A.	USA
Chiba, S.	Japan	Michida, Y.	Japan
Cordova, M. R.	Indonesia	Mu, J.	P.R. China
Cózar Cabañas, A.	Spain	Saito, H.	Japan
Galgani, F.	France	Shim, W.J.	R. Korea
Hagmann, P.	Switzerland	Syakti, A.D.	Indonesia
Hinata, H.	Japan	Takada, H.	Japan
Isobe, A.	Japan	Thompson, R.	UK
Kershaw, P.	UK	Tokai, T.	Japan
Kozlovskii, N.	Russia	Uchida, K.	Japan
Li, D.	P.R. China	Vasilenko, K.	Canada
Lusher, A.L.	Norway	Wang, J.	P.R. China
Martí, E.	Spain		

listed in alphabetical order

1. Relationship between SDGs and Marine Plastic Litter

Goal 12: Ensure sustainable consumption and production patterns

12.2 By 2030, achieve the sustainable management and efficient use of natural resources

12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

Goal 14: Conserve and sustainably use the oceans, seas and marine resources

14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution

14.2 By 2030, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans

3. G20 Meeting

G20 Meeting on Scientific Knowledge and Innovative Solutions was held in October, 2019

Joint initiatives of MOEJ, EU DG Environment and USEPA to take a lead voluntarily in further elaboration of key issues

MOEJ	EU DG Environment	USEPA
• Harmonized monitoring and data compilation	• Sources, pathways, impacts and measures to combat plastic waste leakage	• Innovative solutions for reducing marine plastic litter

• Take the lead in advancing scientific knowledge and innovative solutions by holding workshops and reporting outcomes back to the G20 members

4-2. Guidelines for Harmonizing Ocean Surface Microplastic Monitoring Methods

"Guidelines for Harmonizing Ocean Surface Microplastic Monitoring Methods". (ver. 1.0 in 2019. Revised ver. 1.1 in 2020)

URL of the Guidelines is:
http://www.env.go.jp/en/water/marine_litter/guidelines/guidelines.pdf

Recommendations for sampling methods and laboratory analyses



(3) Presentation by Peter KERSHAW, the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP)

Significance of harmonised monitoring and data compilation

Challenges and opportunities to achieving harmonised monitoring

Dr Peter Kershaw
Independent consultant

Co-chair GESAMP Working Group 40 Sources, fate and effects of plastics and microplastics in the marine environment

GESAMP: Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection, an inter-agency advisory body of the United Nations since 1969.

42nd Workshop on harmonised monitoring and data compilation of marine plastic litter, 7-9 September, on-line

Problems and challenges

The problem:

- Plastic litter and microplastics are found throughout the world ocean, from the Southern Ocean to the deepest ocean trenches
- It causes social, economic and environmental impacts, but these can be difficult to quantify

Challenges:

- The sources are highly variable in space and time, and poorly controlled
- The distribution and quantities of plastic litter and microplastics are difficult to quantify accurately
- There is a need to introduce cost-effective reduction measures
- Measures need to be carefully designed and targeted to have greatest effect
- We need to be able to measure the effectiveness of the measures
- There can be confusion in the use of definitions and terminology

Solutions

- Find out how much litter is entering the environment and from where
- Find out its distribution in space and time
- Characterise it (size, shape, categories, chemical composition, interactions with biota ...)
- Use this information to design measures to reduce the inputs
- Use this information to design targeted removal measures


monitoring and data compilation

Monitoring marine litter – some definitions

Monitoring – measuring the state of the environment in a consistent manner

Indicator – a defined property of the environment, for example:

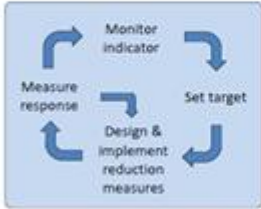
- Number of microplastic particles per unit area of the surface ocean
- Quantity (mass) of plastic particle/objects in the gut of a bird/fish/reptile
- Number of items of litter per unit length of shoreline



Benefit of monitoring indicators

"If we could first know where we are, and whither we are tending, we could better judge what to do, and how to do it ..."
Abraham Lincoln, June, 1858¹


"If you cannot measure it you cannot manage it"
anon.



¹ quote from Meadows, 1992 in "Indicators and information for sustainable development", The Sustainability Institute

Meeting the challenge – monitoring guidelines and protocols to promote harmonised approaches


General principles




Definitions, terminology, survey design, environmental context, sampling & analysis methods, citizen science
www.gesamp.org/publications

Detailed protocols - examples

Shoreline litter



Floating microplastics



Benefits of harmonised monitoring

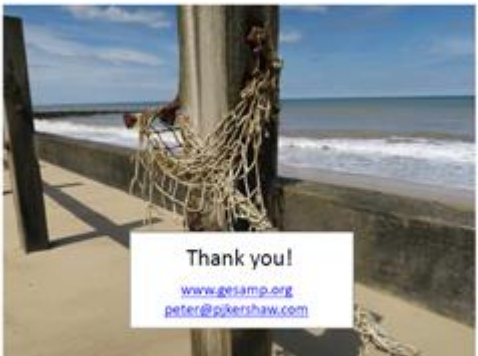
Harmonised indicator selection & monitoring methods

Benefits:

- Reduces uncertainty
- Allows data comparisons
- Permits data sharing
- Encourages cooperation
- Spreads good practice
- Helps fulfil the SDG targets & indicators

Scale of integration:

- National
- Regional
 - Regional Seas
 - ASEAN
 - EU
- International
 - UNEA
 - G20



Thank you!

www.gesamp.org
peter@pkershaw.com

(4) Presentation by Sergey BELOV, IOC-UNESCO Project Office for IODE

**G20 Workshop on harmonized monitoring and data
compilation of marine plastic litter
7 September 2020**

Significance of harmonized monitoring and data
compilation, IODE perspective.



*Dr. Sergey Belov, IODE Co-Chair
Taco de Bruin, IODE Co-Chair*

Introduction

Increasing demands on ocean data and information from different communities together with fragmented and uncoordinated data management approaches leads to difficulties in conducting large-scale science, analysis, modelling and support for decision making

- Science is becoming increasingly collaborative
- Increasing demands for data
- Increasing ability to collect and generate data
- Increasing expectations of researchers (e.g. must think globally, providing access to data an emerging requirement for publication)

Only joint efforts can stimulate data and information access, sharing and integration aiming at delivering knowledge, products and services more effectively to global user communities

Issues and challenges


International organizations, programmes and projects have developed data and information management programmes and activities with national, regional or global focus, often in isolation

Data management as joint effort should strengthen existing data and information systems to better manage the marine environment and serve user communities

Coordination and cooperation among Member States, partners and user communities

Impediments to data sharing, finding, accessing and using the data and related information - cultural, political and financial

- We need to overcome those and make a best use of the new technologies already in place and to be developed and/or applied
- We need a joint data management strategy that will allow active use the data and metadata standards, communications protocols, software, and policies that will knit the parts into a fully integrated approach
- We need to ensure that the data and information management systems are interoperable and can be used by all relevant stakeholders




International Oceanographic Data and Information Exchange (IODC)

International Oceanographic Data and Information Exchange (IODC) of IOC of UNESCO was established in 1965.

Its purpose is to enhance marine research, exploitation and development, by facilitating the exchange of oceanographic data and information between participating Member States, and by meeting the needs of users for data and information products.

Objectives:

- (i) To facilitate and promote the discovery, exchange of, and access to, marine data and information including metadata, products and information in real-time, near real time and delayed mode, through the use of international standards, and in compliance with the IOC Oceanographic Data Exchange Policy for the ocean research and observation community and other stakeholders
- (ii) To encourage the long term archival, preservation, documentation, management and services of all marine data, data products, and information
- (iii) To develop or use existing best practices for the discovery, management, exchange of, and access to marine data and information, including international standards, quality control and appropriate information technology



International Oceanographic Data and Information Exchange (IODE)


IODE is a global network of Member States, Associate Data Users (ADUs), and Associate Information Users (AIUs) that work together to manage marine research and observation data and information and become partners in the IODE network.

IODE supports international scientific and operational marine programmes, including the Framework for Ocean Observing for the benefit of a wide range of users.

IODE Network structure:

- 67 NODCs
- 29 Associate Data Users (ADUs)
- 9 "accredited" NODCs
- 1 "accredited" ADU
- 5 Associate Information Users (AIUs)


Total – 96 formal network members




IODE Network Structure

- Experts
- Observers
- Working
- Laboratory
- Institutions
- Geographical Information
- Systems

Content Themes



Regional, Sectoral, Global



IOC data and information : IODE

- World Ocean Database (WOD)**
world's largest collection of vertical profile data of ocean characteristics
- Ocean Biodiversity Information System (OBIS)**
global open-access data and information clearing-house on marine biodiversity for science, conservation and sustainable development
- Ocean Data Portal (ODP)**
interconnected data repository portal
- OceanDocs**
- OceanExpert**
- Ocean Best Practices**
- ODISCat**

[illegible]

The diagram illustrates the IOC Ocean Data and Information System (ODIS) architecture and its components. It is divided into two main sections: a top section describing the system and its goals, and a bottom section showing the system's workflow and components.

Top Section: IOC Ocean Data and Information System (ODIS)

- IOC Ocean Data and Information System (ODIS)** - an *e-environment* where users can discover coastal and ocean data, information and associated products or services provided by IOC Member States, projects and other partners associated with.
- Target:** Improve the discovery, access, semantic and technical interoperability of existing data and information, and to contribute to the development of a global ocean data and information system

Bottom Section: System Workflow and Components

The workflow is represented by a series of boxes and arrows:

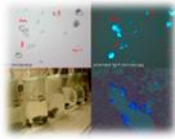
- Concept Paper** (Green box) leads to **Implementation plan and cost benefit analysis** (Blue box).
- Implementation plan and cost benefit analysis** leads to **Repository of ocean data and information** (Green box).
- Repository of ocean data and information** leads to **ODIS-IC project (2019-2021)** (Green box).
- ODIS-IC project (2019-2021)** leads to **Development of ODIS leveraging existing infrastructure** (Green box).
- Development of ODIS leveraging existing infrastructure** leads to **ODIS-IC project (2022-2024)** (Green box).
- ODIS-IC project (2022-2024)** leads to **ODIS-IC project (2025-2027)** (Green box).
- ODIS-IC project (2025-2027)** leads to **ODIS-IC project (2028-2030)** (Green box).
- ODIS-IC project (2028-2030)** leads to **ODIS-IC project (2031-2034)** (Green box).
- ODIS-IC project (2031-2034)** leads to **ODIS-IC project (2035-2038)** (Green box).
- ODIS-IC project (2035-2038)** leads to **ODIS-IC project (2039-2042)** (Green box).
- ODIS-IC project (2039-2042)** leads to **ODIS-IC project (2043-2046)** (Green box).
- ODIS-IC project (2043-2046)** leads to **ODIS-IC project (2047-2050)** (Green box).
- ODIS-IC project (2047-2050)** leads to **ODIS-IC project (2051-2054)** (Green box).
- ODIS-IC project (2051-2054)** leads to **ODIS-IC project (2055-2058)** (Green box).
- ODIS-IC project (2055-2058)** leads to **ODIS-IC project (2059-2062)** (Green box).
- ODIS-IC project (2059-2062)** leads to **ODIS-IC project (2063-2066)** (Green box).
- ODIS-IC project (2063-2066)** leads to **ODIS-IC project (2067-2070)** (Green box).
- ODIS-IC project (2067-2070)** leads to **ODIS-IC project (2071-2074)** (Green box).
- ODIS-IC project (2071-2074)** leads to **ODIS-IC project (2075-2078)** (Green box).
- ODIS-IC project (2075-2078)** leads to **ODIS-IC project (2079-2082)** (Green box).
- ODIS-IC project (2079-2082)** leads to **ODIS-IC project (2083-2086)** (Green box).
- ODIS-IC project (2083-2086)** leads to **ODIS-IC project (2087-2090)** (Green box).
- ODIS-IC project (2087-2090)** leads to **ODIS-IC project (2091-2094)** (Green box).
- ODIS-IC project (2091-2094)** leads to **ODIS-IC project (2095-2098)** (Green box).
- ODIS-IC project (2095-2098)** leads to **ODIS-IC project (2099-2102)** (Green box).
- ODIS-IC project (2099-2102)** leads to **ODIS-IC project (2103-2106)** (Green box).
- ODIS-IC project (2103-2106)** leads to **ODIS-IC project (2107-2110)** (Green box).
- ODIS-IC project (2107-2110)** leads to **ODIS-IC project (2111-2114)** (Green box).
- ODIS-IC project (2111-2114)** leads to **ODIS-IC project (2115-2118)** (Green box).
- ODIS-IC project (2115-2118)** leads to **ODIS-IC project (2119-2122)** (Green box).
- ODIS-IC project (2119-2122)** leads to **ODIS-IC project (2123-2126)** (Green box).
- ODIS-IC project (2123-2126)** leads to **ODIS-IC project (2127-2130)** (Green box).
- ODIS-IC project (2127-2130)** leads to **ODIS-IC project (2131-2134)** (Green box).
- ODIS-IC project (2131-2134)** leads to **ODIS-IC project (2135-2138)** (Green box).
- ODIS-IC project (2135-2138)** leads to **ODIS-IC project (2139-2142)** (Green box).
- ODIS-IC project (2139-2142)** leads to **ODIS-IC project (2143-2146)** (Green box).
- ODIS-IC project (2143-2146)** leads to **ODIS-IC project (2147-2150)** (Green box).
- ODIS-IC project (2147-2150)** leads to **ODIS-IC project (2151-2154)** (Green box).
- ODIS-IC project (2151-2154)** leads to **ODIS-IC project (2155-2158)** (Green box).
- ODIS-IC project (2155-2158)** leads to **ODIS-IC project (2159-2162)** (Green box).
- ODIS-IC project (2159-2162)** leads to **ODIS-IC project (2163-2166)** (Green box).
- ODIS-IC project (2163-2166)** leads to **ODIS-IC project (2167-2170)** (Green box).
- ODIS-IC project (2167-2170)** leads to **ODIS-IC project (2171-2174)** (Green box).
- ODIS-IC project (2171-2174)** leads to **ODIS-IC project (2175-2178)** (Green box).
- ODIS-IC project (2175-2178)** leads to **ODIS-IC project (2179-2182)** (Green box).
- ODIS-IC project (2179-2182)** leads to **ODIS-IC project (2183-2186)** (Green box).
- ODIS-IC project (2183-2186)** leads to **ODIS-IC project (2187-2190)** (Green box).
- ODIS-IC project (2187-2190)** leads to **ODIS-IC project (2191-2194)** (Green box).
- ODIS-IC project (2191-2194)** leads to **ODIS-IC project (2195-2198)** (Green box).
- ODIS-IC project (2195-2198)** leads to **ODIS-IC project (2199-2202)** (Green box).
- ODIS-IC project (2199-2202)** leads to **ODIS-IC project (2203-2206)** (Green box).
- ODIS-IC project (2203-2206)** leads to **ODIS-IC project (2207-2210)** (Green box).
- ODIS-IC project (2207-2210)** leads to **ODIS-IC project (2211-2214)** (Green box).
- ODIS-IC project (2211-2214)** leads to **ODIS-IC project (2215-2218)** (Green box).
- ODIS-IC project (2215-2218)** leads to **ODIS-IC project (2219-2222)** (Green box).
- ODIS-IC project (2219-2222)** leads to **ODIS-IC project (2223-2226)** (Green box).
- ODIS-IC project (2223-2226)** leads to **ODIS-IC project (2227-2230)** (Green box).
- ODIS-IC project (2227-2230)** leads to **ODIS-IC project (2231-2234)** (Green box).
- ODIS-IC project (2231-2234)** leads to **ODIS-IC project (2235-2238)** (Green box).
- ODIS-IC project (2235-2238)** leads to **ODIS-IC project (2239-2242)** (Green box).
- ODIS-IC project (2239-2242)** leads to **ODIS-IC project (2243-2246)** (Green box).
- ODIS-IC project (2243-2246)** leads to **ODIS-IC project (2247-2250)** (Green box).
- ODIS-IC project (2247-2250)** leads to **ODIS-IC project (2251-2254)** (Green box).
- ODIS-IC project (2251-2254)** leads to **ODIS-IC project (2255-2258)** (Green box).
- ODIS-IC project (2255-2258)** leads to **ODIS-IC project (2259-2262)** (Green box).
- ODIS-IC project (2259-2262)** leads to **ODIS-IC project (2263-2266)** (Green box).
- ODIS-IC project (2263-2266)** leads to **ODIS-IC project (2267-2270)** (Green box).
- ODIS-IC project (2267-2270)** leads to **ODIS-IC project (2271-2274)** (Green box).
- ODIS-IC project (2271-2274)** leads to **ODIS-IC project (2275-2278)** (Green box).
- ODIS-IC project (2275-2278)** leads to **ODIS-IC project (2279-2282)** (Green box).
- ODIS-IC project (2279-2282)** leads to **ODIS-IC project (2283-2286)** (Green box).
- ODIS-IC project (2283-2286)** leads to **ODIS-IC project (2287-2290)** (Green box).
- ODIS-IC project (2287-2290)** leads to **ODIS-IC project (2291-2294)** (Green box).
- ODIS-IC project (2291-2294)** leads to **ODIS-IC project (2295-2298)** (Green box).
- ODIS-IC project (2295-2298)** leads to **ODIS-IC project (2299-2302)** (Green box).
- ODIS-IC project (2299-2**



(5) Presentation by ISOBE Atsuhiko, Professor, Kyusyu University

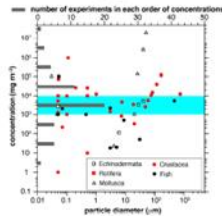
Significance of harmonized monitoring and data compilation to advance microplastic studies

Atsuhiko Isobe
Research Institute for Applied Mechanics, Kyushu University



damages (feeding rate ↓, mortality etc...) were revealed > 1000 mg/m³

Laboratory-based studies to date have investigated biological damages on aqua biota exposed to small microplastics with different diameters and concentrations



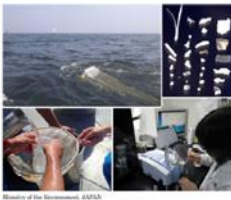
Isobe et al., (2019; Nature Communications)



The damages revealed in organisms in laboratory-based studies will be realized in the nature?

We have to monitor microplastics persistently in the actual ocean on the basis of the standardized/harmonized protocol.

Guidelines for Harmonizing Ocean Surface Microplastic Monitoring Methods
Yoshio U. et al. 2019



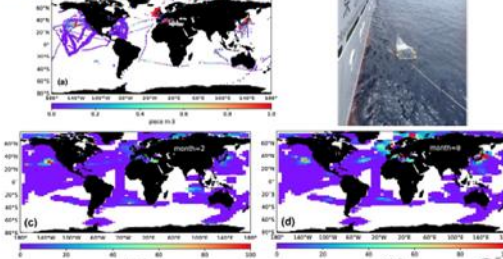
Michida et al., (2019)
Ministry of the Environment, JAPAN

Latest guidelines provides a standardized method integrated guidelines published to date.



GESAMP (2019)

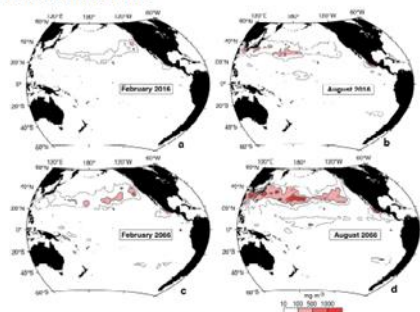
> 7000 data of microplastic abundance obtained by surface net towing from 2000 to 2019.



Processed data of surface microplastic abundance (mg/m³) in February and August using satellite-derived winds and an optimum interpolation method

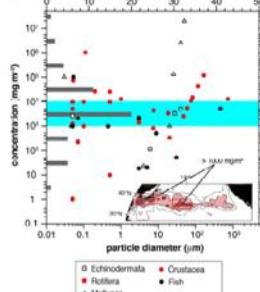
Isobe et al., (in preparation)

Microplastic abundance after 50 years predicted by a numerical simulation



Isobe et al., (2019; Nature Communications)

number of experiments in each order of concentrations

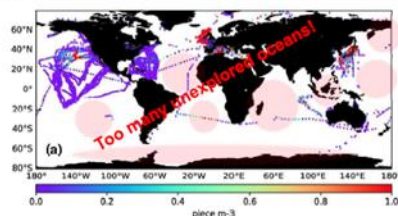


Unless the amount of mismanaged plastic waste is reduced substantially, marine plastic pollution is likely to proceed to a point of no return, beyond which marine organisms will be harmed, as has been shown in laboratory experiments.



Isobe et al., (2019; Nature Communications)

✓ We have to persistently monitor the status of marine plastic litter in the current oceans.



✓ Observation network using a harmonized protocol of microplastic survey is required among different countries

✓ A framework of international data center for marine plastic litter is required to synthesize the observed data

(6) Presentation by Muhammad Reza CORDOVA, Indonesian Institute of Sciences



Significance of harmonized monitoring and data compilation:
Monitoring and survey in Indonesia

G20 Workshop on harmonized monitoring and data compilation of marine plastic litter
7th September 2020

Research Center for Oceanography
Indonesian Institute of Sciences

Muhammad Reza Cordova
muhammad.reza.cordova@iipi.go.id

Where is all the plastic?

Plastic waste input from land to ocean: Asia_hot spot



Fig. 3. Global map with each country shaded according to the estimated mass of mismanaged plastic waste (tonnes) generated in 2010 by populations living within 50 km of the coast. The combined G20 countries' countries not included in the study are shaded white.

Jambeck et al., (2015) Science Magazine

G20 Workshop - 7th September 2020

Indonesia's Plan of Action on Marine Plastic Debris

Presidential Decree No. 83/2018 on Handling of Marine Debris



1. BEHAVIORAL CHANGE
2. REDUCED LAND-BASED LEAKAGE
3. REDUCED SEA-BASED LEAKAGE
4. ENHANCED LAW ENFORCEMENT AND FINANCIAL
5. RESEARCH AND DEVELOPMENT

Achieving the target of plastic waste reduction (70% by 2025) at sea is implemented in an integrated manner through the program in 16 Ministries and Institutions with 59 activities supporting the above 5 Strategies

G20 Workshop - 7th September 2020

Lesson Learn

Monitoring marine litter in Indonesia

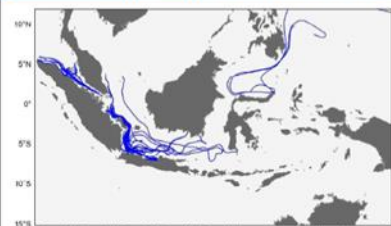
No.	Province	City	Researcher	Method	Year
1	Bali	Kuta	...	...	...
2	Bali	Kuta	...	...	...
3	Bali	Kuta	...	...	...
4	Bali	Kuta	...	...	...
5	Bali	Kuta	...	...	...
6	Bali	Kuta	...	...	...
7	Bali	Kuta	...	...	...
8	Bali	Kuta	...	...	...
9	Bali	Kuta	...	...	...
10	Bali	Kuta	...	...	...
11	Bali	Kuta	...	...	...
12	Bali	Kuta	...	...	...
13	Bali	Kuta	...	...	...
14	Bali	Kuta	...	...	...
15	Bali	Kuta	...	...	...
16	Bali	Kuta	...	...	...
17	Bali	Kuta	...	...	...
18	Bali	Kuta	...	...	...
19	Bali	Kuta	...	...	...
20	Bali	Kuta	...	...	...
21	Bali	Kuta	...	...	...
22	Bali	Kuta	...	...	...
23	Bali	Kuta	...	...	...
24	Bali	Kuta	...	...	...
25	Bali	Kuta	...	...	...
26	Bali	Kuta	...	...	...
27	Bali	Kuta	...	...	...
28	Bali	Kuta	...	...	...
29	Bali	Kuta	...	...	...
30	Bali	Kuta	...	...	...
31	Bali	Kuta	...	...	...
32	Bali	Kuta	...	...	...
33	Bali	Kuta	...	...	...
34	Bali	Kuta	...	...	...
35	Bali	Kuta	...	...	...
36	Bali	Kuta	...	...	...
37	Bali	Kuta	...	...	...
38	Bali	Kuta	...	...	...
39	Bali	Kuta	...	...	...
40	Bali	Kuta	...	...	...
41	Bali	Kuta	...	...	...
42	Bali	Kuta	...	...	...
43	Bali	Kuta	...	...	...
44	Bali	Kuta	...	...	...
45	Bali	Kuta	...	...	...
46	Bali	Kuta	...	...	...
47	Bali	Kuta	...	...	...
48	Bali	Kuta	...	...	...
49	Bali	Kuta	...	...	...
50	Bali	Kuta	...	...	...

Challenge and limitation:

- Limits to staff capacity and expertise are the main challenges to monitoring
- Terminology, guidelines, and reporting tools make monitoring even more challenging
- Different method used - underestimate or overestimate
- Harmonization method and data will help Indonesia to monitor marine litter pollution 'apple to apple' not only between Indonesian area but also globally

G20 Workshop - 7th September 2020

What will happen to debris in the ocean?



Where will debris go?


- JAMSTEC OFES (Ocean General Circulation Model for the Earth Simulator)
- Backward trajectory simulation
- 365 days
- Debris comes from riverine area
- Mostly ended in local beach
- It will be transboundary debris

Research Center for Oceanography, Indonesian Institute of Sciences, 2015. Policy Paper - Initiation of Indonesia Marine Debris Data to Complement National Plan of Action for Marine Debris Management in accordance with Presidential Decree No. 83 of 2018.

G20 Workshop - 7th September 2020

Lesson Learn

Monitoring marine litter in Indonesia: stranded beach litter



- UNEP (2009)
- NOAA (2012)
- CSIRO (2014)
- RCO-LIPI (2018)
- MOF-KOEM (2019)
- Indonesian MOEF (2020)*

*draft, unpublished

The approach is the same : waste per area

Difference:

- which areas were sampled
- waste categorization
- sampling time


Challenge: periodical observation

In Indonesia, most observations are only made when there is no periodical event, so the data has a big bias.

promote and implement citizen science

G20 Workshop - 7th September 2020

Lesson Learn: Marine Debris Monitoring in Indonesia



To get precision marine litter data

- Adapt NOAA and UNEP shoreline debris assessment for stranded debris (150 m x 6 m)
- 18 sites monitoring for 13 months (Feb 2018 - March 2019)
- Collect monthly sample in exact same location and similar time (spring tides at full moon or new moon)

G20 Workshop - 7th September 2020

Citizen Science Marine Debris Monitoring : www.marinedebris.id*



*Website on update and maintenance process since 1st September 2020

G20 Workshop - 7th September 2020

Lesson Learn: Marine Debris Monitoring in Indonesia

With an assumption

- ~30% plastic debris accumulate in the coastline
- Indonesian coastline 99,093 km
- No input of plastic debris from outside Indonesia
- Does not take into account mangrove, seagrass and coral reefs as well as other areas that accumulate plastic debris

An estimation of plastics litter to the ocean from Indonesian anthropogenic activity, by monthly monitoring & modeling

Average percentage stranded plastic litter 47.58±11.79% (by weight)
Dominated by single use plastic

0.27 – 0.59 MMT per-year

Research Center for Oceanography, Indonesian Institute of Sciences, 2018. Policy Paper - Initiation of Indonesia Marine Debris Data to Complement National Plan of Action for Marine Debris Management in accordance with Presidential Decree No. 63 of 2018

Lesson Learn: Microplastic

Monitoring microplastics in Indonesia

- NOAA (2015)
- UNEP (2016)
- GESAMP (2019)
- MOE Japan (2019, 2020)

The approach is the same :

- microplastics per area
- Microplastics per volume
- Microplastics density

Difference :

- sampling tools
- extraction method
- laboratory condition

There is no available agreed method globally, there is a need for method harmonization

Data is needed for scientific evidence such as debris hotspots, prediction of its number and movement

G20 Workshop - 1st September 2020

Lesson Learn: initiatives for harmonizing monitoring measures at the national level

Collaboration with the Government of Japan (Ministry of the Environment)

- August-September 2019, Japan
- 28 August - 5 Sept, Sampling Method in Shinyo-Marui Vessel
- 7-9 Sept, FTIR Analysis and Measurement of Microplastic in Sanyo Techno Marine
- 30 Sept - 9 Oct 2019 Marine litter survey targets: floating marine litter, floating microplastics, beach litter, Jakarta Bay, Indonesia
- March 2019 and February 2020
- Expert Meeting in Japan on Monitoring Methods for Microplastic
- The Indonesian Ministry of Environment and Forestry will establish a Regional Capacity Center for Clean Seas (RC3S) in Bali, which aims to protect coastal and marine ecosystems from the activities of land-based sources of pollution.

G20 Workshop - 1st September 2020

Terima kasih

Thank you – どうもありがとうございました – شكرا لك

Gracias – Danke – תודה לך – Grazie – תודה רבה

international.marineconf@epa.gov

G20 Workshop - 1st September 2020

(7) General comment by Jane NISHIDA, Office of International and Tribal Affairs, U.S. Environmental Protection Agency

U.S. Marine Debris Monitoring and Data Collection

Jane Nishida, US Environmental Protection Agency
G20 Japan Marine Litter Workshop on Harmonizing Monitoring and Data Collection
September 7, 2020

- Importance of Monitoring and Data Collection
- US Agency Involvement
- Marine Debris Monitoring and Assessment Project
- Monitoring Success Stories
- Marine Debris Shoreline Monitoring Decision Framework

Topics of Discussion

Importance of Marine Debris Monitoring and Data Collection

- Having sound data on prevalence of marine debris is critical to understanding true state of the challenge, whether on shorelines, in water column, on seabed, or in biota
- Monitoring allows us to get sense of the scale of problem in specific locations, determine how much debris may be accumulating, and understand what common debris types are occurring
- This information allows better informed decisions on what specific management, policy and regulatory interventions may be needed to address specific issues and locations

Importance of Marine Debris Monitoring and Data Collection


- Since marine debris types and concentrations vary greatly based on local conditions, implementing well coordinated and comprehensive marine debris monitoring programs help target interventions to local conditions
- Monitoring can also be used to assess whether such interventions have been effective in reducing marine debris
- This is especially important given the lack of resources that governments, particularly local governments, have to address marine debris.
- Collecting accurate information through monitoring help governments to focus resources, management and policies on most troublesome types of marine debris in specific locations

US Agency Involvement

- National Oceanic and Atmospheric Administration (NOAA)
- Environmental Protection Agency (EPA)
- Department of Interior (USFWS)
- US Coast Guard
- US Navy
- Department of State
- US Agency of International Development (USAID)


Marine Debris Monitoring and Assessment Project (MDMAP)

- Citizen science initiative led by NOAA that engages US partners and volunteers to survey and record the amount and types of marine debris on shorelines
- Each partner in the MDMAP Network selects nearby shoreline monitoring site that they return to monthly to conduct survey and submit data to NOAA's MDMAP Online Database
- To aid in the collection, NOAA has developed a field guide for conducting shoreline surveys for marine debris which is available on website
- NOAA also has marine debris tripler and data analysis templates to help partners to collect data that can be compared across the U.S.




Marine Debris Monitoring and Assessment Project (MDMAP) Examples

- Gulf of Mexico – Dauphin Island Sea Lab in Alabama established 36 monitoring sites across 6 barrier islands and 4 states
- Oregon Coast – Oregon Sea Grant, Oregon Coastwatch, and Surfrider Foundation established 16 monitoring sites across the Oregon coast
- Virginia Coast – Virginia Coastal Zone Management, Virginia Waterways, and Virginia Aquarium established 4 monitoring sites across the Virginia coast




Marine Debris Monitoring Toolkit for Educators

- Designed to assist teachers in educating their students about marine debris and involving them in marine debris research and outreach
- Using toolkit, students conduct marine debris surveys and enter data into national database
- Also encourages students to analyze marine debris data, better understand impacts, and become better environmental stewards



New International Collaboration on Marine Debris

- NOAA and State Department will be working with the Asia Pacific Economic Cooperation (APEC) Oceans and Fisheries Working Group to develop technical guide on marine debris monitoring
- The goal of this project is to produce a Marine Debris Shoreline Monitoring Decision Framework that will serve as a practical guide for governments, research entities and others to undertake shoreline marine monitoring, based on local conditions, capacities, needs and issues
- U.S. will be working with Mexico and Canada under new trilateral trade agreement (USMCA) to implement program to assess, prevent, and remove marine debris in North America



Thank You

(8) Presentation by Alessandra GIORGETTI, the European Marine Observation and Data Network (EMODnet) Chemistry



EU efforts for data harmonisation for policy purposes

G20 Workshop on harmonized monitoring and data compilation of marine plastic litter, 7th September 2020, Online, Japan

Alessandra Giorgetti | OGS, Italy
 Georg Hanke | EC JRC
 Francois Galgani | IFREMER, France
 Matteo Vinci
 Maria Eugenia Molina Jack



EU policy framework

EU MSFD (Marine Strategy Framework Directive 2008/56/EC), the EU Member States are committed to the protection of the European Seas by achieving Good Environmental Status by 2020



11 Descriptors of the State of the Marine Environment:

- Biodiversity
- Alien
- Fishes
- Food
- Eutro
- Seaflo
- Hydro
- Conta
- Conta
- Mar
- Ener

Quantitative Criteria:

- Beach litter
- Sea Surface litter
- Seafloor litter
- Micro-litter
- Biota entanglement
- Litter ingestion

Baselines, Thresholds + Targets

EMODnet **MSFD Technical Group on Marine Litter (TG ML)**

MSFD CIS working group set-up to **coordinate** the implementation of monitoring, compiling data, defining baselines & thresholds, providing harmonised protocols

- Chaired by France, Germany, JRC*
- EC, EEA
- EU Member States
- Regional Sea Conventions
- Other stakeholders
- 113 Members

Collaboration through on-line platform, annual meeting and technical workshops

*Science and knowledge service of the European Commission

Link to reports:
https://mcs.jrc.ec.europa.eu/main/dev.py?w=41&O=43&store_chap=70%2F%2F2520Marine%2F2520Litter

EMODnet **EU efforts on data management**

THE EUROPEAN MARINE OBSERVATION AND DATA NETWORK – REA GLANCE

Over 100 expert teams providing and sharing evidence marine data, metadata & products

Long-term initiative (2009...) by DG MARE as part of EU Blue Growth strategy

- to unlock marine data, facilitating access and re-use
- for different domains

Towards the new vision

- interoperability (FAIR)

EMODnet

EMODnet Chemistry

Collect, aggregate, standardize, quality check data, share information and products on marine water quality:

- Marine Litter
- Eutrophication
- Contaminants
- Ocean acidification

Data on water, biota and sediment

Group	Examples
Eutrophication	nutrients, dissolved gases... N, P, Si, O ₂ , O ₂ d/s
Ocean acidification	acidity pH, pCO ₂
Contaminants	hydrocarbons, heavy metals, pesticides... anthracene, fluoranthene, Me, Co, Pb, TBT, DDTs
Marine Litter	beach litter, washed litter, microplastic

<http://www.emodnet-chemistry.eu/>

EMODnet **Support to EU MSFD Directive**

- EMODnet Chemistry aims at providing access to marine chemistry data and generating products relevant for the implementation of the EU Marine Strategy Framework Directive (MSFD, 2008)
- Tight connection with EEA, RSCs, JRC, ICES through MSFD Experts Board meetings to obtain feedbacks on data products useful for indicators of MSFD descriptors

Logos: European Agency, OSPAR, JRC, ICES, UNEP, etc.

EMODnet **EU Network of data centres**

EMODnet Chemistry brings together 16 organisations from 11 countries along European seas, and a group of 24 data centres and organizations joining the open Advisory Forum, including ICES and the regional sea conventions (OSPAR, HELCOM, UNEP/MAP and BSC)

EMODnet **Data and metadata standards:**

Adopts and adapts SeaDataNet, the consolidated pan-European infrastructure set up and operated for ocean and marine data management

- Adoption of ISO 19115-19139 standard for describing metadata (on data sets, research cruises, monitoring networks, research projects => marine metadata profiles, schemas, schematron rules)
- Controlled vocabularies for the marine domain (>65,000 terms in 82 lists), with international governance and web service
- Standard data exchange formats: ASCII and binary (NetCDF) fully supported by controlled vocabularies

Works together with IOC/IOOE and ICES for maintenance and dissemination of standard QA-QC procedures

EMODnet **Protocols and formats agreed at European scale (MSFD TG ML)**

BEACH	SEAFLOOR	FLOATING MICROLITTER
Based on consolidated protocols adopted by regional sea conventions (OSPAR, UNEP, TG ML)	Based on consolidated protocols (ICES, MEDITS, DeFishGear)	More fragmented and heterogeneous management
New EMODnet format and tools based on OSPAR data format	New EMODnet format based on ICES and MEDITS	New EMODnet format based on SeaDataNet/EMODnet data formats and infrastructure

Collect all type of data with central submission facilities, and provide open access to harmonized information

EMODnet **Litter Databases content**

Database	Source	Countries	Beaches	Surveys
Beach	OSPAR-MCS database Data collection from Member States EMODnet partners and associates, EEA Marine Litter Watch	38 countries	1096 beaches	7077 surveys
Seafloor	ICES-DATRAS database DeFishGear, EMODnet partners	23 countries		4328 surveys
Floating microlitter	EMODnet partners, Volvo Ocean Race	6 countries		183 surveys

Counts updated at 01/09/2020

Viewing services: data products

EMODnet

beach litter surveys:
location and lists
used during the
surveys (official
monitoring & other
sources)

seafloor trawlings:
surveys location
and trawling gears
used



Microplastics for a global assessment

EMODnet
European Marine Observation and Data Network

Data template is available to undertake collection of available datasets from EU Member States through TG ML by EMODnet Chemistry

Mandatory data (min-max depth, distance, net-opening, mesh-size, type, size & count), weight, —

Possible link with Japanese approach / G20 platform for global assessment

Protocols to be harmonised

	Minimum	Maximum
Size	Across size of each filter. Minimum resolution is to report in the range of 100-1000 µm	1000 µm
Type	Waste (plastic, rubber, plastic bags, film, foams, plastic cups, plastic cutlery, etc.)	Plastic, bioplastic, cardboard, metal, paper, aluminium, glass, wood, etc.
Shape	As plastic collected after the netting, other shapes	As plastic, irregular, cylindrical, cylindrical, angular
Colour	For general, recorded separately, colour and texture	Black, white, grey, yellow, red, green, blue, orange, pink, purple, etc.



(9) Presentation by LI Daoji, East China Normal University

PROGRESS in Understanding Marine Plastic and Microplastic Issues

Timeline of Key Milestones:

- 1972:** First microplastic discovery (1972)
- 1974:** First microplastic discovery (1974)
- 1976:** First microplastic discovery (1976)
- 1978:** First microplastic discovery (1978)
- 1980:** First microplastic discovery (1980)
- 1982:** First microplastic discovery (1982)
- 1984:** First microplastic discovery (1984)
- 1986:** First microplastic discovery (1986)
- 1988:** First microplastic discovery (1988)
- 1990:** First microplastic discovery (1990)
- 1992:** First microplastic discovery (1992)
- 1994:** First microplastic discovery (1994)
- 1996:** First microplastic discovery (1996)
- 1998:** First microplastic discovery (1998)
- 2000:** First microplastic discovery (2000)
- 2002:** First microplastic discovery (2002)
- 2004:** First microplastic discovery (2004)
- 2006:** First microplastic discovery (2006)
- 2008:** First microplastic discovery (2008)
- 2010:** First microplastic discovery (2010)
- 2012:** First microplastic discovery (2012)
- 2014:** First microplastic discovery (2014)
- 2016:** First microplastic discovery (2016)
- 2018:** First microplastic discovery (2018)
- 2019:** First microplastic discovery (2019)

Key Milestones and Publications:

- 1972:** First microplastic discovery (1972)
- 1974:** First microplastic discovery (1974)
- 1976:** First microplastic discovery (1976)
- 1978:** First microplastic discovery (1978)
- 1980:** First microplastic discovery (1980)
- 1982:** First microplastic discovery (1982)
- 1984:** First microplastic discovery (1984)
- 1986:** First microplastic discovery (1986)
- 1988:** First microplastic discovery (1988)
- 1990:** First microplastic discovery (1990)
- 1992:** First microplastic discovery (1992)
- 1994:** First microplastic discovery (1994)
- 1996:** First microplastic discovery (1996)
- 1998:** First microplastic discovery (1998)
- 2000:** First microplastic discovery (2000)
- 2002:** First microplastic discovery (2002)
- 2004:** First microplastic discovery (2004)
- 2006:** First microplastic discovery (2006)
- 2008:** First microplastic discovery (2008)
- 2010:** First microplastic discovery (2010)
- 2012:** First microplastic discovery (2012)
- 2014:** First microplastic discovery (2014)
- 2016:** First microplastic discovery (2016)
- 2018:** First microplastic discovery (2018)
- 2019:** First microplastic discovery (2019)

Number of Publications on Microplastics (1972-2019)

Year	Number of Publications
1972	1
1974	2
1976	3
1978	4
1980	5
1982	6
1984	7
1986	8
1988	9
1990	10
1992	11
1994	12
1996	13
1998	14
2000	15
2002	16
2004	17
2006	18
2008	19
2010	20
2012	21
2014	22
2016	23
2018	24
2019	25

Key Milestones and Publications:

- 1972:** First microplastic discovery (1972)
- 1974:** First microplastic discovery (1974)
- 1976:** First microplastic discovery (1976)
- 1978:** First microplastic discovery (1978)
- 1980:** First microplastic discovery (1980)
- 1982:** First microplastic discovery (1982)
- 1984:** First microplastic discovery (1984)
- 1986:** First microplastic discovery (1986)
- 1988:** First microplastic discovery (1988)
- 1990:** First microplastic discovery (1990)
- 1992:** First microplastic discovery (1992)
- 1994:** First microplastic discovery (1994)
- 1996:** First microplastic discovery (1996)
- 1998:** First microplastic discovery (1998)
- 2000:** First microplastic discovery (2000)
- 2002:** First microplastic discovery (2002)
- 2004:** First microplastic discovery (2004)
- 2006:** First microplastic discovery (2006)
- 2008:** First microplastic discovery (2008)
- 2010:** First microplastic discovery (2010)
- 2012:** First microplastic discovery (2012)
- 2014:** First microplastic discovery (2014)
- 2016:** First microplastic discovery (2016)
- 2018:** First microplastic discovery (2018)
- 2019:** First microplastic discovery (2019)

CHALLENGES of Marine Microplastic Monitoring

One of the considerable challenges is harmonizing standardized methods for microplastic sampling and analysis in different environmental matrix

- Standardized methodology that could extract the actual MP contamination level in the environment
- Harmonized methodology that could make the data comparison across studies and regions impossible
- Assess the MP contamination level and hotspots at regional and global levels

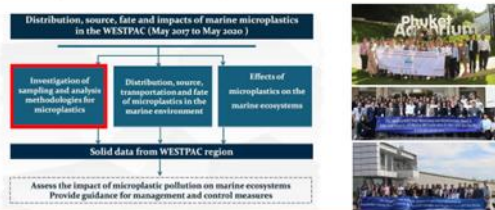
GLOBAL Initiatives to Harmonize Methodology

Many organizations (NOAA, UNEP, WESTPAC, MSFD, WIOMSA) has done tremendous work publishing guidelines, trying to harmonize the plastic and microplastic monitoring methodologies



WESTPAC Initiatives on Marine Microplastic Issues

Program: Distribution, source, fate and impacts of marine microplastics in the WESTPAC (UNESCO IOC-WESTPAC)



WESTPAC Initiatives on Marine Microplastic Issues

Harmonizing guidelines, include improved methodologies based on current practices: Sediments (Beaches, Sea floor), Seawater (surface, water column, and river flux) and marine biota

Pilot studies in countries under the framework of IOC-WESTPAC



WESTPAC Initiatives on Marine Microplastic Issues

UNESCO/IOC Regional Training and Research Center on Plastic Marine Debris and Microplastics

Under the IOC-WESTPAC and all the member states, the RTRC will stay in close contact with other institutions and make unremitting efforts for our due contribution to coping with marine plastic litter and microplastic pollution



NOWPAP Harmonizing Methods to Monitor Microplastics

the four member states of the Northwest Pacific Action Plan: China, Japan, Korea and Russian



CHINA Initiatives to Harmonize Methodologies for MP

National Key Research and Development Program (2016-2020): Marine Microplastic Monitoring and Ecological Risk Assessment Technology Research (East China Normal University)

One of major scientific question is to establish a standardized method for microplastic monitoring in China
Outcomes: Technical regulation for monitoring of marine microplastics (NMEMC & ECNU, in Chinese)



CHINA-JAPAN Cooperation in the field of marine litter under the framework of high-level consultation on Ocean affairs

- the international laboratory comparison of microplastics monitoring technology and methods organized by the Japanese Ministry of Environment
- the seminars on the monitoring technology of micro plastics in Japan, so as to promote the coordination and Harmonization of the monitoring technology and methods of microplastics
- the marine litter joint survey in Dalian



SINO-NORWEGIAN Initiatives for Combating Microplastics

Sino-Norwegian cooperation project on capacity building for reducing plastic and microplastic pollution (SINOPLAST)

Harmonized methodologies will be used in this project

Sino-Norwegian cooperation project on capacity building for reducing plastic and microplastic pollution (SINOPLAST)
中挪合作海洋塑料和微塑料污染能力建设项目(SINOPLAST)



THANK YOU FOR YOUR ATTENTION

Daoli Li
Professor
State Key Laboratory of Estuarine and Coastal Research, East China Normal University
Director
Plastic Marine Debris Centre, East China Normal University
Director
Regional Training and Research Center on Plastic Marine Debris and Microplastics, UNESCO/IOC
Email: daoli@sklec.ecnu.edu.cn


(10) Presentation by CHIBA Sanae, JAMSTEC

G20 Workshop on harmonized monitoring and data compilation of marine plastic litter
7th September 2020, Online, Japan

***Session 2:
Promoting harmonized monitoring and
data sharing around the world***

1. JAMSTEC Deep-Sea Debris Database

**2. Toward the implementation of globally integrated
marine debris observation system**

 Sanae Chiba
Marine Plastics Research Group, JAMSTEC

JAMSEC Deep-sea Debris Database

Open to public since 2017

Searched on the video footages of **> 5000 dive** records of ROVs and Submersibles of JAMSTEC



38 thousand hrs of videos and over **1.5 million** photos

> 35-years record since 1983 to present

Data up to **>10000 m** deep

Data format: **Darwin Core** Standard



Places of collection at Mariana Trench

JAMSEC Deep-sea Debris Database

Open to public "Deep-sea Debris Data"

- Natural debris is also categorized besides artificial materials such as plastic.
- Date, Area, and depth information are also available.
- Information about organisms and sediments observed together with debris is also available.

Deep-sea Debris Database Data List and Playback / Download

[illegible]

JAMSEC Deep-sea Debris Database

The data tell... plastics are ubiquitous

Number of Records and Percentages by Category by Depth

Material	Number of Records	Percentage
Plastic	272	80%
Metal	56	16%
Other	12	4%

Plastic is the most abundant among debris

Ratio of plastics increases in deep-sea (~80%)

Single-use plastics are ubiquitous (80-90% of plastic debris).

Remots of Atlantic North Pacific

[CJCS et al. *Marine Pollution Bulletin* 2016 112 (2016) 1022]

Existing Database (GEO Blue Planet White Paper)
marine litter database > 25

Stoll et al. (in peer review) <https://doi.org/10.1007/s10646-023-03181-4>

Marine Debris Monitoring and Assessment Project
Global Map


Uttterbase, AWI

EMCONET Chemistry

One Planet One Ocean

Establishments of the globally coordinated, sustaining observation system & data collation platform are awaited to ensure knowledge-based managements of marine litter.

Plastic currents
A global distribution system for marine plastics



UNEP & GRID-Arendal, 2010

The diagram illustrates the challenge of creating an integrated marine debris database and the steps to ensure data interoperability. At the top, a box labeled 'Challenge of Integrated Marine Debris Database' points to a central goal: 'To Ensure Data Interoperability'. This goal is supported by two main strategies: 'FAIR Data standard' and 'Coordinated observing'. The 'FAIR Data standard' strategy includes the principles: Findable, Accessible, Interoperable (highlighted in red), and Reusable. The 'Coordinated observing' strategy includes: EOVs, Guidelines, and Governance. Both strategies lead to intermediate steps: 'Common data format' from the FAIR standard and 'Harmonization of methods' from coordinated observing. Finally, arrows from these two intermediate steps point to the bottom goal: 'Develop Best Practices'.

```
graph TD
    A[Challenge of Integrated Marine Debris Database] --> B[To Ensure Data Interoperability]
    B --> C[FAIR Data standard]
    B --> D[Coordinated observing]
    C --> E[Findable  
Accessible  
Interoperable  
Reusable]
    D --> F[EOVs  
Guidelines  
Governance]
    E --> G[Common data format]
    F --> H[Harmonization of methods]
    G --> I[Develop Best Practices]
    H --> I
```

Challenge of Integrated Marine Debris Database

To Ensure Data Interoperability

FAIR Data standard

- Findable
- Accessible
- Interoperable
- Reusable

Coordinated observing

- EOVs
- Guidelines
- Governance

Common data format

Harmonization of methods

Develop Best Practices

2. Toward the implementation of globally integrated marine debris observation system



Proposal of the Integrated Marine Observation System (IMDOS)

September 2019 (Maximenko et al. 2019).

Recommendation

To answer scientific questions and societal demands

- Establish **global observing & information system** to evaluate sources/sinks, abundance, trends, risks and the efficiency of reduction measures, and to get the problem under control
- Achieve understanding of the issues of marine debris through **development of efficient in situ observation technology, remote sensors, models and monitoring strategies**, involving citizen scientists when possible
- Ensure an integrated, **standardized and harmonized collaborative network**, using commonly accepted methods & definitions.



GOOS offers the **CAPACITY** and **RESOURCES** to support a **COLLABORATIVE** effort to:

- develop **GLOBAL COORDINATION** of an Integrated Marine Debris Observing System
- establish Marine (Plastic) Debris as a **Human Pressure Essential Ocean Variable (EOV)**.



EU H2020 EuroSea project (2019-2023)

Improving and Integrating European Ocean Observing and Forecasting Systems for Sustainable Use of the Oceans
Coordinator: Tessa Tenhues (GEOMAR, Germany; GOOS Co-Chair)

- Dedicated human resources from GOOS Staff: 1 person, full-time for a 2-year period
- Organization of two expert workshops; coordination & communication services



Evolving and Sustaining Ocean Best Practices (OBP) WS IV

18; 21-25 & 30 Sep 2020 (Online)
<https://www.oceanbestpractices.org/events/evolving-and-sustaining-ocean-best-practices-iv/>

Marine Debris Working Group agenda (tentative)

- Global frameworks for selecting priority indicators and variables for monitoring (from global observation to development of SDG 14.1.1. Indicator: marine plastics density)
- Towards standard sampling protocols
- Best practices for remote sensing of marine debris
- Best practices for modelling
- Best practices for citizen science monitoring
- Global Platform - how does it work?

Ocean Observing Value Chain



(11) Presentation by ABE Tatsuya, MOEJ

Japan's initiatives for Marine Plastic Litter monitoring

September, 2020
Tatsuya ABE
Ministry of the Environment, Japan

環境省 Ministry of the Environment

1. Background of harmonizing monitoring and data sharing

Examples of purpose of data sharing

- ◆ To promote **efficient environmental monitoring** (e.g. **by identifying high density areas**)
- ◆ To improve and validate **computer simulations** of identification of sources and future microplastic distributions
- ◆ To encourage **further harmonization of monitoring methods**
- ◆ To provide more reliable data for use in **biological and socio-economic impact assessment**

Contribution to SDG 14.1

環境省 Ministry of the Environment

2. Guidelines for harmonizing

"Guidelines for Harmonizing Ocean Surface Microplastic Monitoring Methods"
(ver. 1.0 in 2019. Revised ver. 1.1 in 2020)

URL of the Guidelines is:
http://www.env.go.jp/en/water/marine_litter/guidelines/guidelines.pdf

Recommendations for sampling methods and laboratory analyses

環境省 Ministry of the Environment

2. Guidelines for harmonizing

Review of Existing Papers and Guidelines

- GESAMP, NOAA, UNEP etc., **Inter Laboratory Comparison 2017 (ILC2017)**
- A cross-check was implemented using a common pair of standard samples to **estimate "experimental variance"** among different laboratories.
- **Twelve institutes in 10 countries** participated.


Comparison of Microplastic Sampling Methods 2018 & 2019 (CMSM2018 & CMSM2019)

- Field survey was conducted to **estimate the "sampling error"** from net-sampling of microplastics.
- With a simple rig, a fishing boat can tow a net at its side.

環境省 Ministry of the Environment 2. Guidelines for harmonizing

Recommendations

- Tow a net for sampling at 1 to 3 knots. But, 1 to 2 knots are recommended for small fishing boats, to protect their rig for sampling from potential damages
- No statistically significant difference between Neuston net and Manta net in their performance when they have a similar immersion depth.
- Tow a net for sampling from the side of a boat (not from the stern).
 - A small fishing boat with a crossbar can tow a net for sampling. Ends of the crossbar shall be connected to a bitt of the boat by a rope to support the bar.
- Digest organic matters in the pretreatment of samples for accurate analyses of particles smaller than 1 mm
- Report the concentrations and weights of microplastics, separately for particles larger than 1 mm from those smaller than 1 mm



環境省 Ministry of the Environment 3. Concept of data sharing project

Purpose and assumed users

For researchers
To facilitate researches such as monitoring, simulations, and impact assessments through harmonized database

In addition

For policy-makers
To design more reasonable and efficient measures to reduce marine plastic litter through comparable data

For general public
To raise awareness on the marine plastic litter through reliable and easy-to-understand mapping

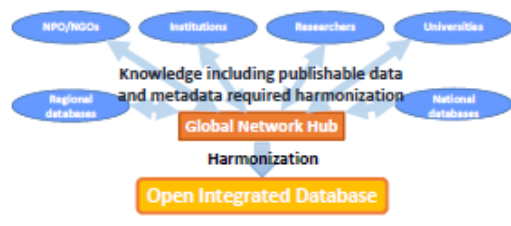
環境省 Ministry of the Environment 3. Concept of data sharing project

- Target of the first step
 - Microplastics at the ocean surface
- Distinguish quality-controlled (QC) data
 - Data obtained with appropriate procedures described in the Guidelines during sampling and laboratory analyses (e.g. wind speed of less than 5 m/s, vessel speed of 1-3 knots)
 - QC data and non-QC data to be presented in separate database (e.g. wind speed exceeding 5 m/s)
- Distinguish harmonized data
 - Distinguish harmonized data based on the Guidelines (e.g. microplastics of 1 mm < d < 5 mm collected with nets)
- Present data converted to an uniform unit (e.g. items/km² → items/m³)

環境省 Ministry of the Environment 3. Concept of data sharing project

Rationale for this project

- This project aims to create a global network hub to share and compile the monitoring activities collaborating with existing and further other initiatives
- This project produces additional values by harmonization and simplification

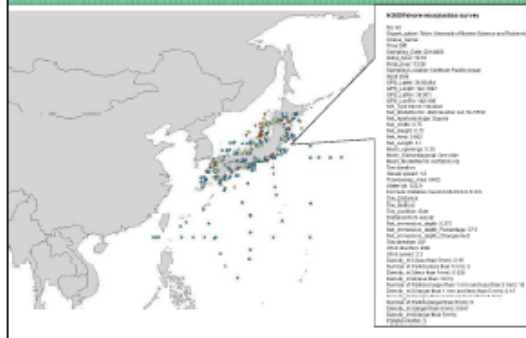


環境省 Ministry of the Environment 3. Concept of data sharing project

How to operate

- We will establish an expert advisory committee with researchers recommended by cooperating bodies, for promoting transparency.
- In consideration of advice from the committee, we will decide the management, such as;
 - The data policy
 - Quality control
 - Data format
 - Promotion of data sharing.
- We will incorporate the opinions of users at the early stage of database construction.

環境省 Ministry of the Environment 3. prototype of data sharing project



環境省 Ministry of the Environment 3. Steps for development

1st step

- A data-input form sent from MOEJ to the Guidelines' authors.
- Joint papers produced with the researchers who have submitted their data

2nd step

International networking

- G20 framework
- Asian countries
- Other leading bodies

Development of data sharing system

- Data policy
- Analysis tools for data providers

Knowledge compiling

- MOEJ to collect monitoring activities and data from published papers

↓

Prototype database for release on the website

3rd step

- International campaign to promote uses of the database and further provisions of data for their improvement