

Japan's initiatives for Marine Plastic Litter monitoring

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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

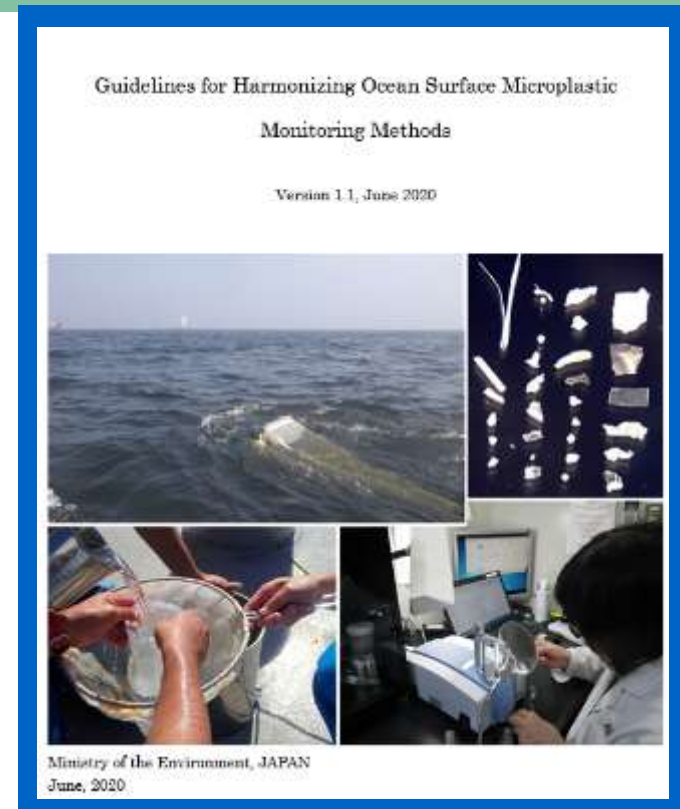


Contribution to SDG 14.1

“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



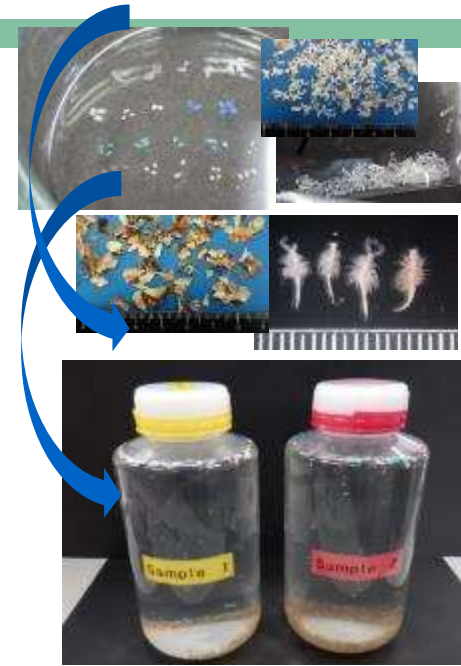
2. Guidelines for harmonizing

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)

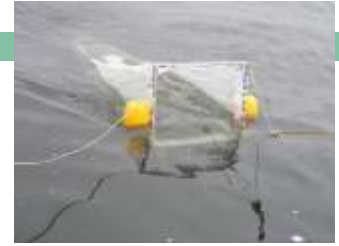
- Field survey was conducted **to estimate the "sampling error"** from net-sampling of microplastics.
- With a simple rig, a fishing boat can tow a net at its side.



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**



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**

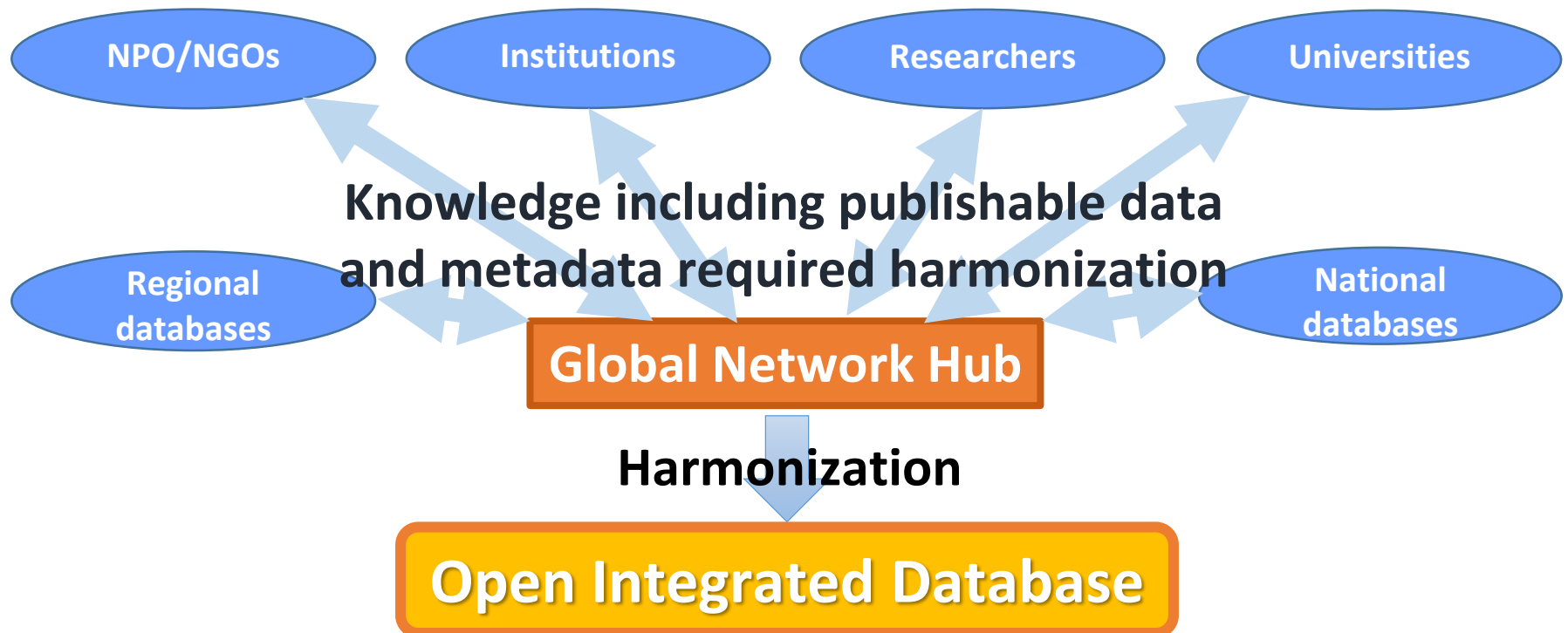
3. Concept of data sharing project

- ◆ 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 $1 \text{ mm} < d < 5 \text{ mm}$ collected with nets)
- ◆ Present data converted to an uniform unit (e.g. items/km² → items/m³)

3. Concept of data sharing project

Rationale for this project

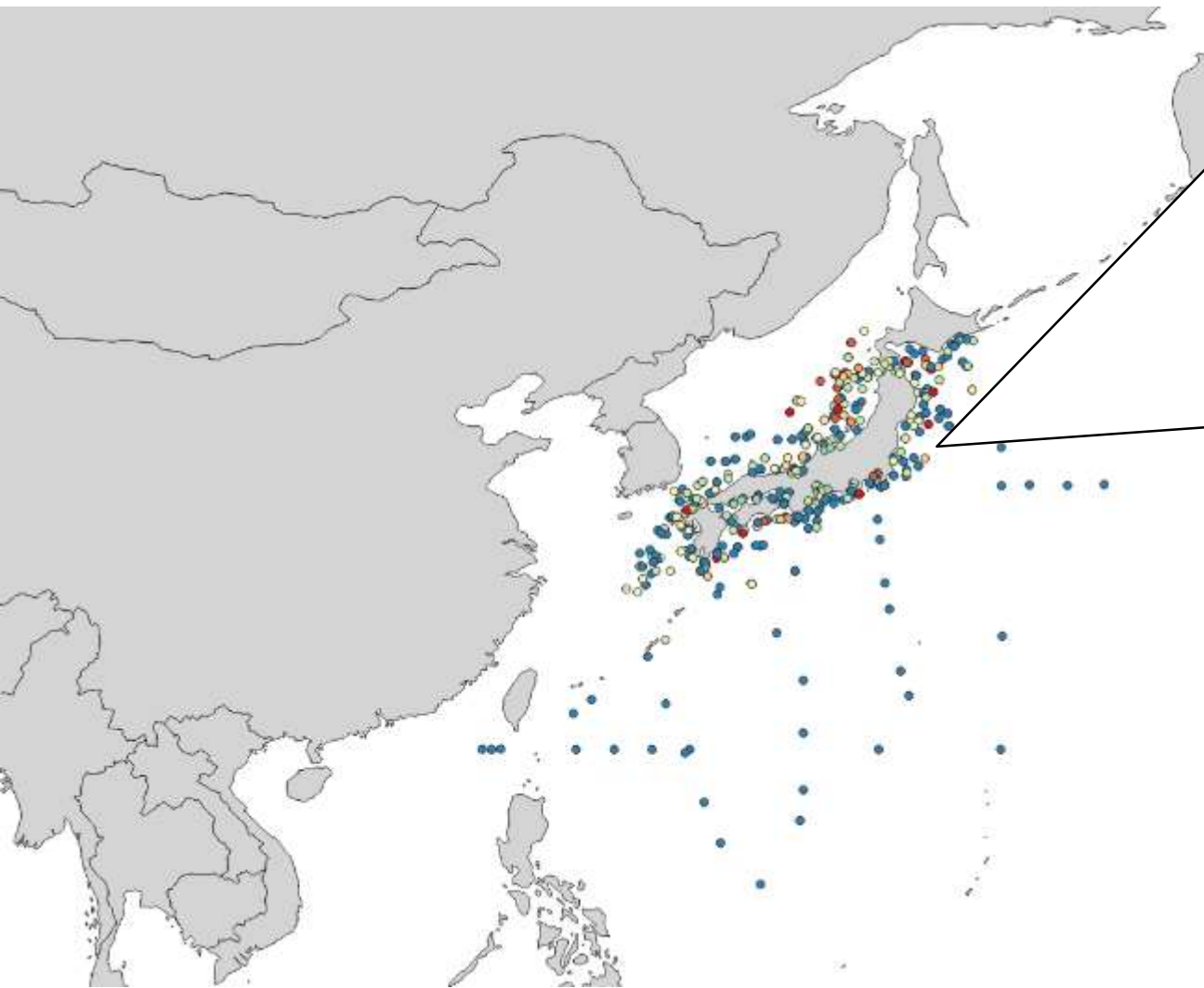
- ◆ This project aims to create a global network hub to share and compile the monitoring activities collaborating with existing and further other initiatives
- ◆ This project produces additional values by harmonization and simplification



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.

3. prototype of data sharing project



H26Offshore micoplastics survey

No: 45
 Organi_ zation: Tokyo University of Marine Science and Technology
 Cruise_name:
 Time Diff:
 Sampling_Date: 2014/8/8
 Initial_hour: 13:16
 Final_hour: 13:36
 Sampling Location: Northern Pacific ocean
 Input style:
 GPS_LatInt: 36.00494
 GPS_LonInt: 142.1097
 GPS_LatFin: 36.001
 GPS_LonFin: 142.106
 Net_Type frame: Neuston
 Net_ModelNumb: JMANeuston net, No.5552
 Net_Apertureshape: Square
 Net_Width: 0.75
 Net_Height: 0.75
 Net_Area: 0.562
 Net_Length: 3.1
 Mesh_openings: 0.35
 Mesh_Sideordagonal: One side
 Mesh_ModelNumb: net fabric nip
 Tow duration:
 Vessel speed: 1.2
 Trawlsweep_Area: 6402
 Water Vol: 122.9
 Formula: Rotation count×0.064m3×0.5×0.6
 Tow_Distance:
 Tow_Method:
 Tow_position: Side
 Distance from vessel:
 Net_immersion_depth: 0.375
 Net_immersion_depth_Percentage: 37.5
 Net_immersion_depth_Changeornot:
 Tow direction: SW
 Wind direction: ESE
 Wind speed: 2.3
 Density_m3 (less than 5mm): 0.15
 Number of Particle(less than 1mm): 3
 Density_m3(less than 1mm): 0.024
 Density_km2(less than 1mm):
 Number of Particle(larger than 1 mm and less than 5 mm): 18
 Density_m3(larger than 1 mm and less than 5 mm): 0.15
 Density_m2(larger than 1 mm and less than 5 mm):
 Number of Particle(larger than 5mm): 5
 Density_m3(larger than 5mm): 0.041
 Density_km2(larger than 5mm):
 Pollution RANK: 3

3. Steps for development

