

***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**



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# JAMSTEC 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***





# JAMSTEC Deep-sea Debris Database

## Open to public “Deep-sea Debris Data”

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

深海デブリデータベース  
Deep-sea Debris Database

JAMSTEC

Home Data List How to Use Japanese

Enter keywords

Advanced search

Data Tree

- ALL Data(2314)
- Debris(2314)
  - Plastic(737)
    - Plastic bottle(23)
    - Plastic bag(626)
    - Other plastic product(103)
  - Glass(49)
  - Cup(1)
  - Bin(48)
  - Rubber(58)
    - Tire(33)
    - Other rubber product(24)
  - Metal(369)
    - Can(297)
    - Equipment/Tools(66)
  - Natural debris(269)
    - Piece of plant(147)
    - Wood(123)
    - Animal's body parts(2)
  - Cloth/Paper/Lumber(43)
    - Wear(13)
    - Lumber(9)
    - Paper(13)
    - Cloth(8)
  - Other artificial debris(922)
    - Rope(47)
    - Fishing gear(56)
    - Sandbag(11)
    - Unidentified debris(133)

Data List

List Map

New/Updated data

| Image | Types                | Date       | Area                      | Shooting depth (m) | Types of sea |
|-------|----------------------|------------|---------------------------|--------------------|--------------|
|       | A label for beverage | 1995/08/21 | Suruga Bay                | 990                | Sandy mud    |
|       | A packaging bag      | 1984/02/06 | Nankai Trough/Kumano-Nada |                    | Sandy mud    |
|       | A packaging bag      | 1985/04/19 | Suruga Bay                |                    | Sandy mud    |
|       | A packaging bag      | 1986/03/22 | Suruga Bay                |                    | Sandy mud    |
|       | A packaging bag      | 1989/10/18 | Sagami Bay/Off Hatsushima | 1158               | Sandy mud    |
|       | A packaging bag      | 1990/11/06 | Sagami Bay                | 1166               | Sandy mud    |

VIDEO ID:3K0011SATUM1010\_00433700\_00450700

Marine Litter  
plastic bag(Many)

Depth: 1383.0 - 1386.0m  
Time: 12:41:34 - 12:43:04

Dive Area:  
Suruga Bay  
Dive Date (LST): 1988/02/13  
Related Links

Download

To download, you have to login / user registration.  
Click here after login.

JAMSTEC E-library of Deep-sea Images







Plastic bag, Piece of p...

1983/03/05

Suruga Bay

Shooting depth : Unknown  
SHINKAI2000 0046 Dive



Plastic bag

2006/08/13

Kii Channel

Shooting depth : 952m  
HYPER-DOLPHIN 0593 Dive

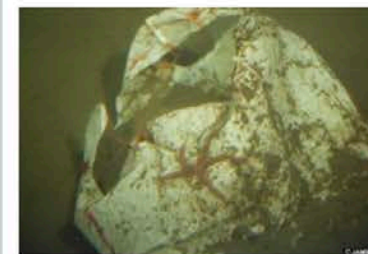


Plastic bag, Piece of p...

1989/08/26

Sea of Japan/Toyama Bay

Shooting depth : Unknown  
SHINKAI2000 0435 Dive



Plastic bag

1998/10/06

Nankai Trough

Shooting depth : Unknown  
SHINKAI2000 1057 Dive



Plastic bag

1994/08/29

Sea of Japan

Shooting depth : Unknown  
SHINKAI2000 0757 Dive



Plastic bag/sheet (Many...

1991/06/13

Suruga Bay

Shooting depth : Unknown  
SHINKAI6500 0058 Dive



Piece of plant/wood, Sh...

2002/03/25

Suruga Bay

Shooting depth : 1554m  
SHINKAI6500 0666 Dive

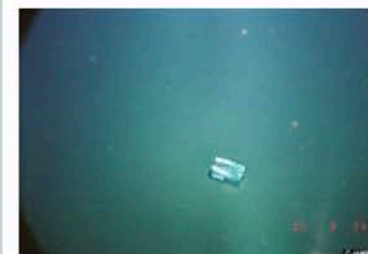
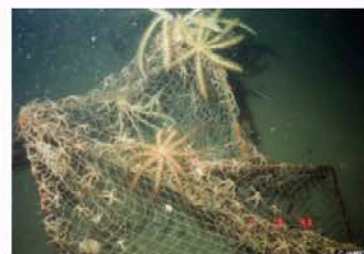


Artificial debris

2009/09/22

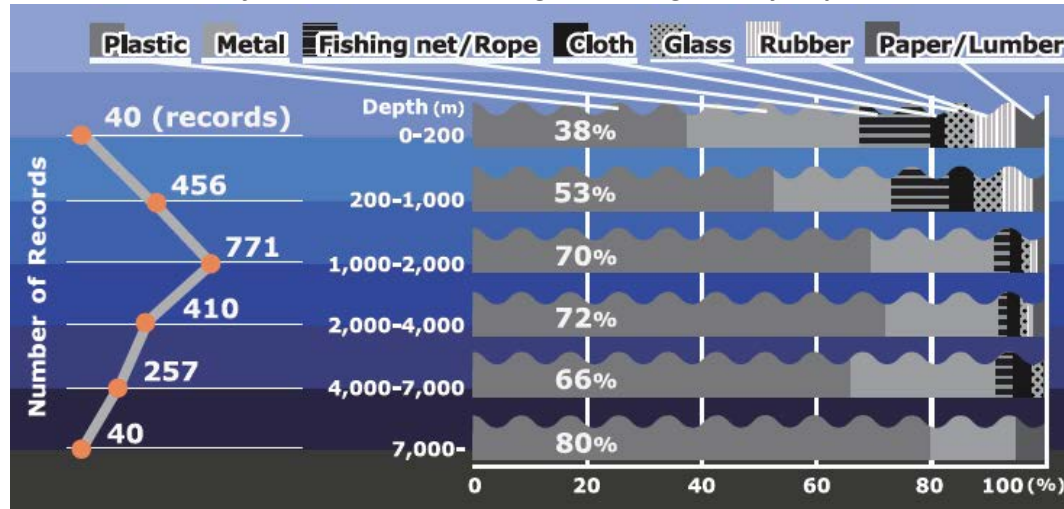
Sea of Japan/Oki Bank

Shooting depth : 915m  
HYPER-DOLPHIN 1055 Dive



## The data tell... plastics are ubiquitous

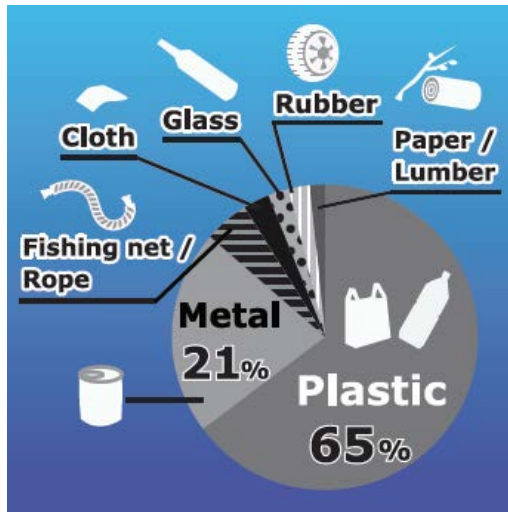
Number of Records and Percentages & Categories by Depth



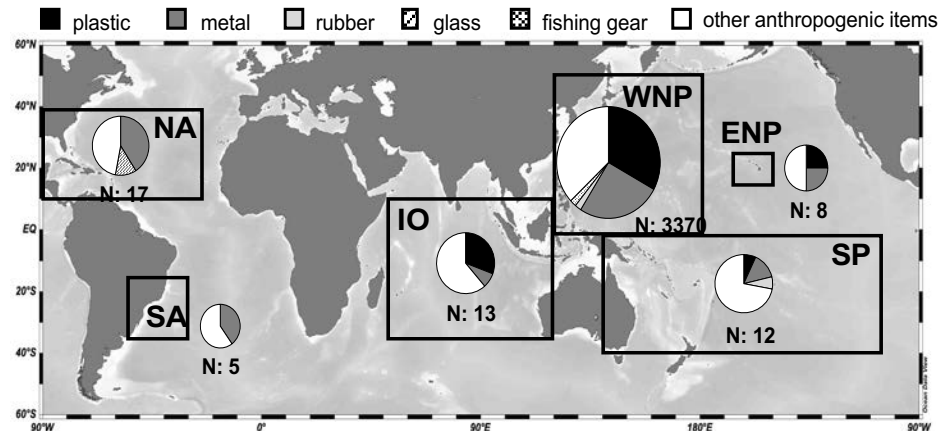
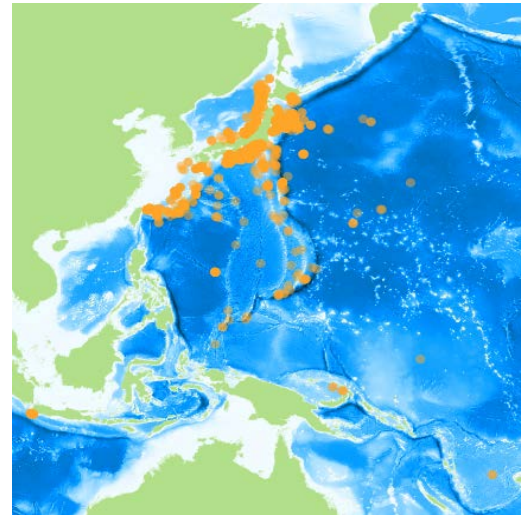
Plastic is the most abundant among debris

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

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



Records of Western North Pacific



(Chiba et al. doi.org/10.1016/j.marpol.2018.03.022)



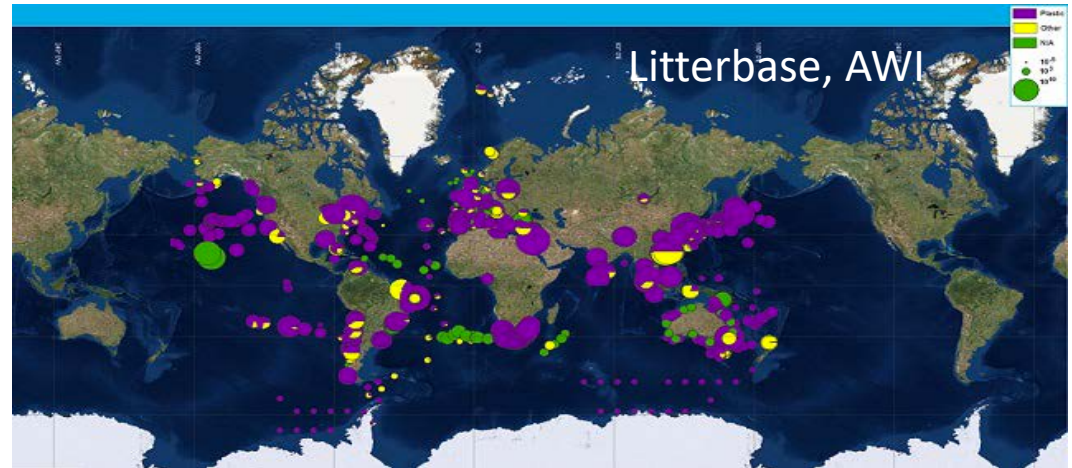
# Existing Database (GEO Blue Planet White Paper)

marine litter database > 25

Smail et al (in peer review) <https://geoblueplanet.org/blue-planet-activities/marine-litter-working-group/>



Trash information and Data for Education and Solutions



HORIZONTAL SECTION VERTICAL SECTION

- EMODNET CHEMISTRY - LITTER
- Beach litter (2001 - 2018)
  - Official monitoring
    - Beaches locations and litter list used - Official monitoring
      - Number surveys & temporal coverage - Official monitoring
      - Beach Litter - Mean total number of litter items per 100m & to 1 survey - Official monitoring
      - Beach Litter - Composition of litter according to material categories in percent - Official monitoring
      - Beach Litter - Mean number of Cigarette related items per 100m & to 1 survey - without UNEP, MARLIN - Official monitoring
      - Beach Litter - Mean number of Cigarette related items per 100m & to 1 survey - UNEP, MARLIN - Official monitoring
      - Beach Litter - Mean number of Fishing related items per 100m & to 1 survey - Official monitoring
      - Beach Litter - Mean number of Plastic bags related items per 100m & to 1 survey - Official monitoring
  - Other sources
- Seabed litter (2006 - 2018)
  - Seabed litter - Trawls locations
  - Seabed litter - Density (Nb. items/km2)
  - Seabed litter - Material categories percentage per year
  - Seabed litter - Fishing related items density (Nb. items/km2)
  - Seabed litter - Plastic bags density (Nb. items/km2)

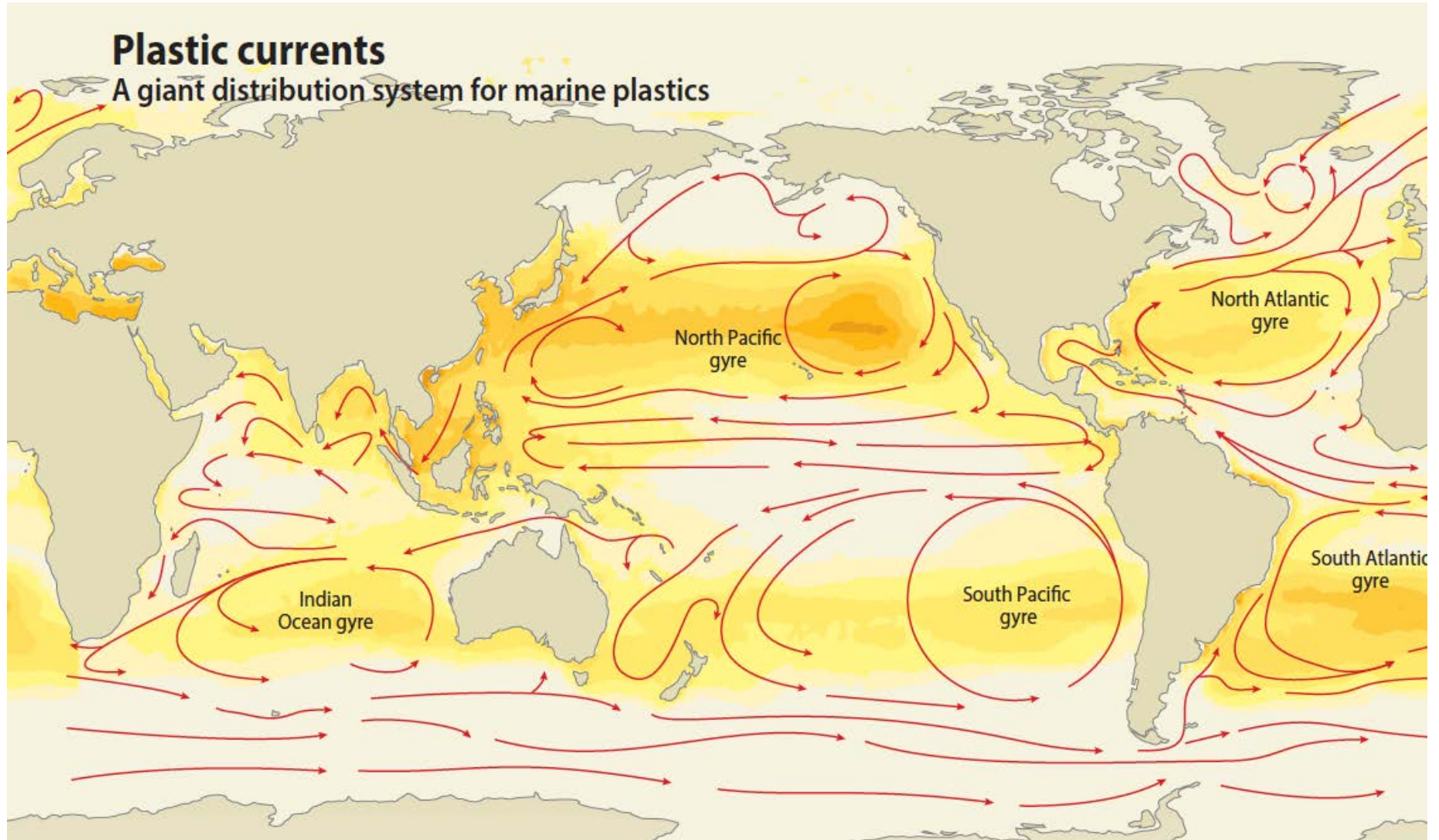


EMODNET Chemistry



# One Planet One Ocean

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



(UNEP & GRID-Arendal, 2016)

# 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



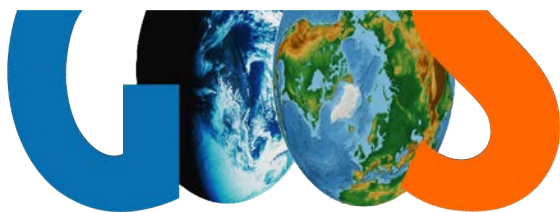
### Proposal of the Integrated Marine Observation System (IMDOS)

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: **Toste Tanhua** (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/>

## Marin 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

**Players/ Stakeholders**

**Actions / Roles**

**Keywords**

