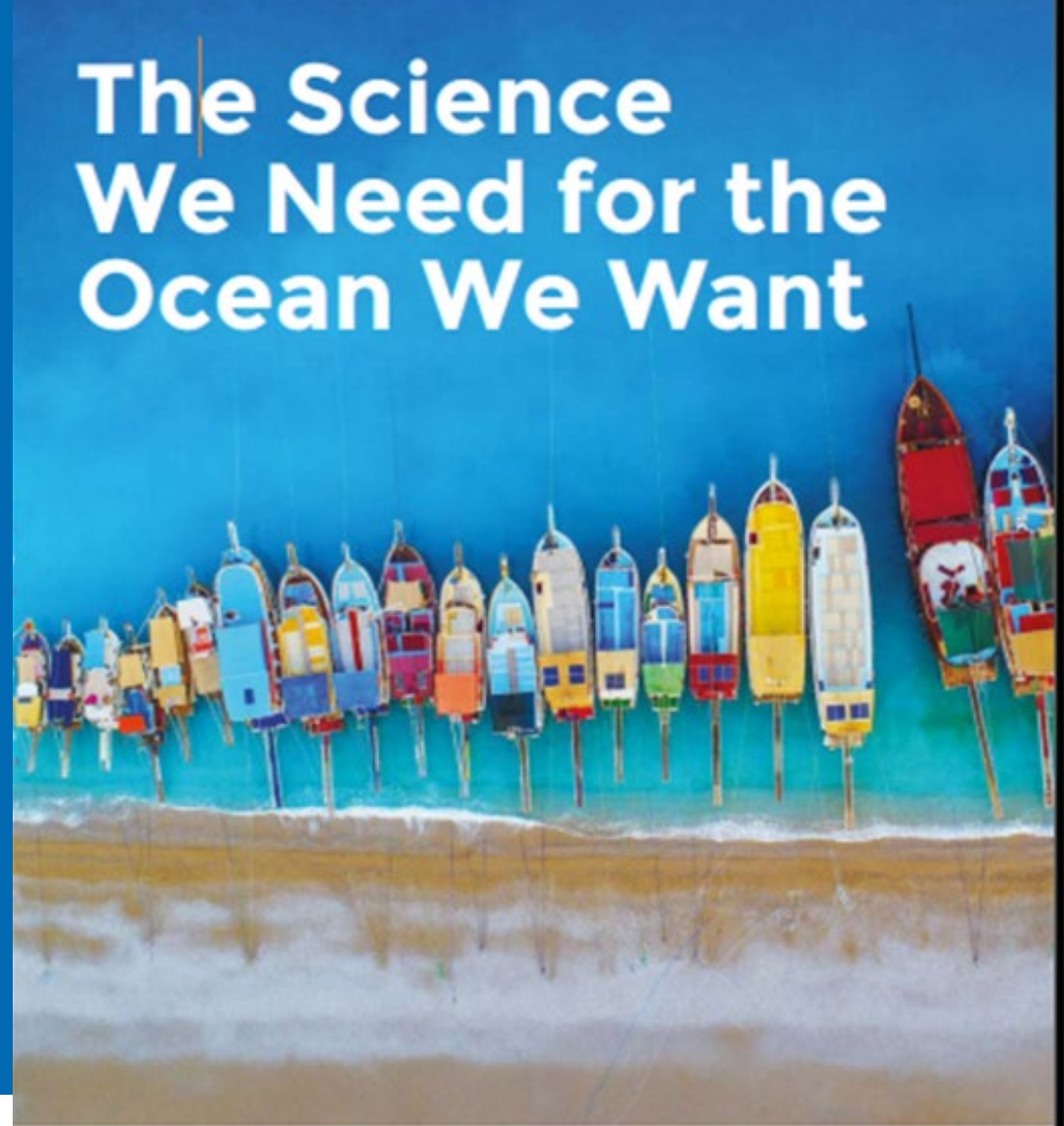


The UN Decade of Ocean Science for Sustainable Development (2021-2030)

Dr Cesar TORO
IOC of UNESCO

*International Seabed Authority
Kingston, Jamaica
10-12 March 2019*



The Science We Need for the Ocean We Want



United Nations
Educational, Scientific and
Cultural Organization



Intergovernmental
Oceanographic
Commission



Sustainable
Development
Goals

The United Nations
Decade of Ocean Science
for Sustainable Development
(2021-2030)



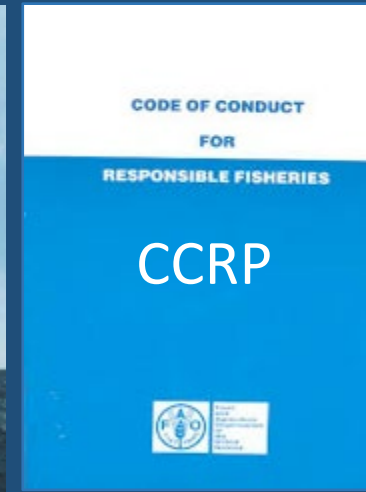
2021
2030 United Nations
Decade of Ocean Science
for Sustainable Development

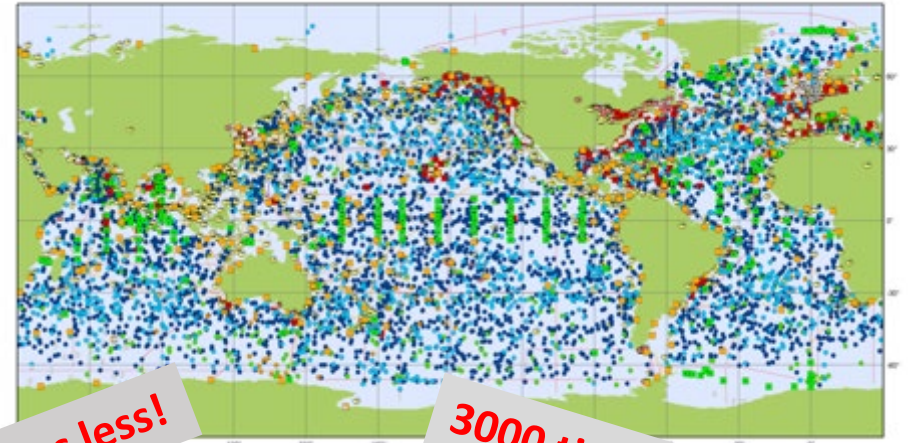
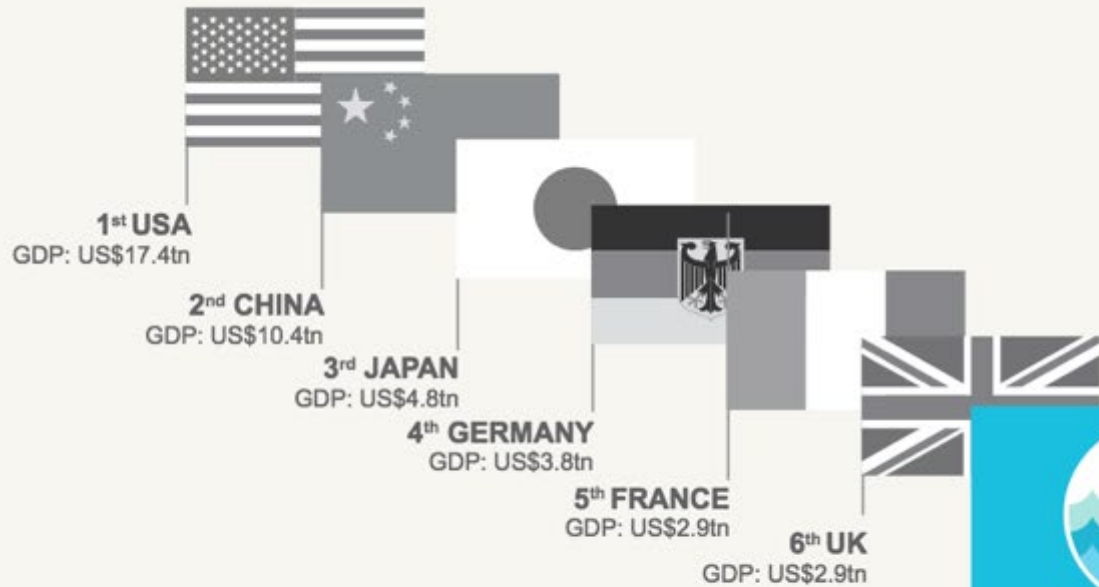
Ocean in the UN Frameworks



Sendai Framework for Disaster Risk Reduction

2015 - 2030



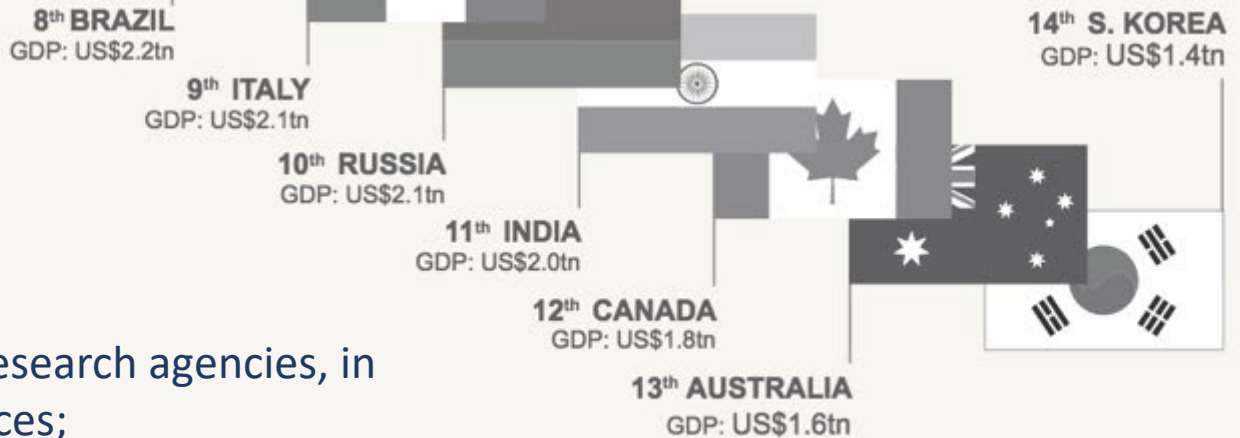


3000 times less!

3000 times less!



7th THE OCEAN
US\$2.5tn

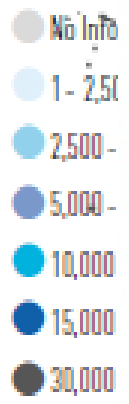


Ocean Science Funding: largely by research agencies, in average 4% of funding natural sciences;

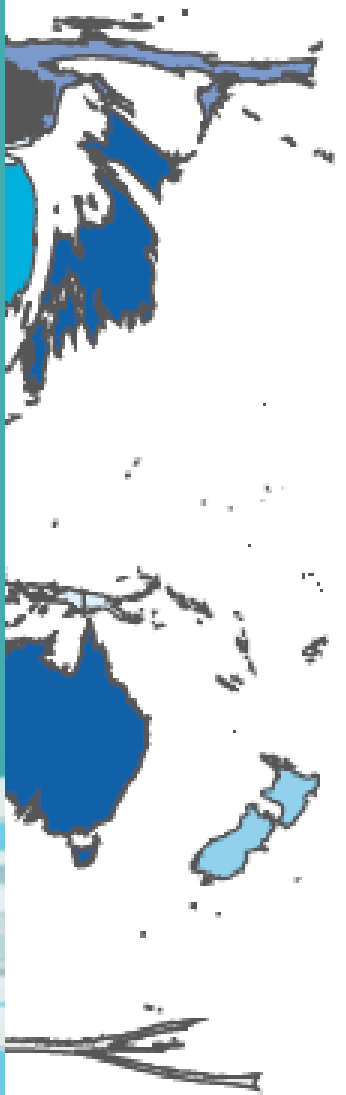
Global Ocean Science Capacity



Science-M



The Current Status of Ocean Science around the World





UCL



TIME FOR CHANGE ?
Climate Science Reconsidered



Jane Lubchenko

**New social contract
for natural science**

The ocean science remains *voluntary*, while starting to support *legally-binding treaties* and address *existential issues*.

It is grossly *under-resourced*. The *governance is weak*. *Capacity is very unevenly distributed*.

Oceanography is *fit for highlighting problems* but is only *starting to systematically provide solutions*.

It needs *mainstreaming*.



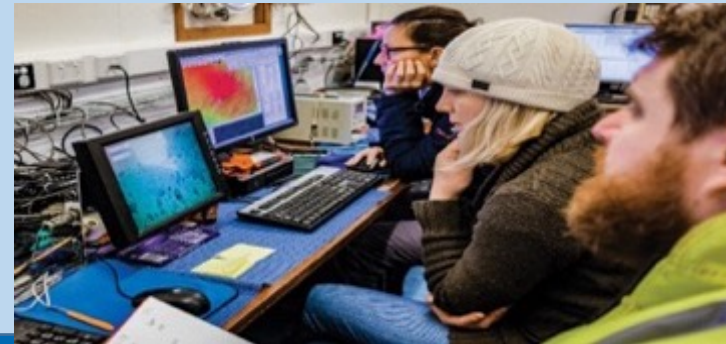
Expected Societal Outcomes of the Decade

A clean Ocean



A healthy & resilient Ocean

A predicted Ocean



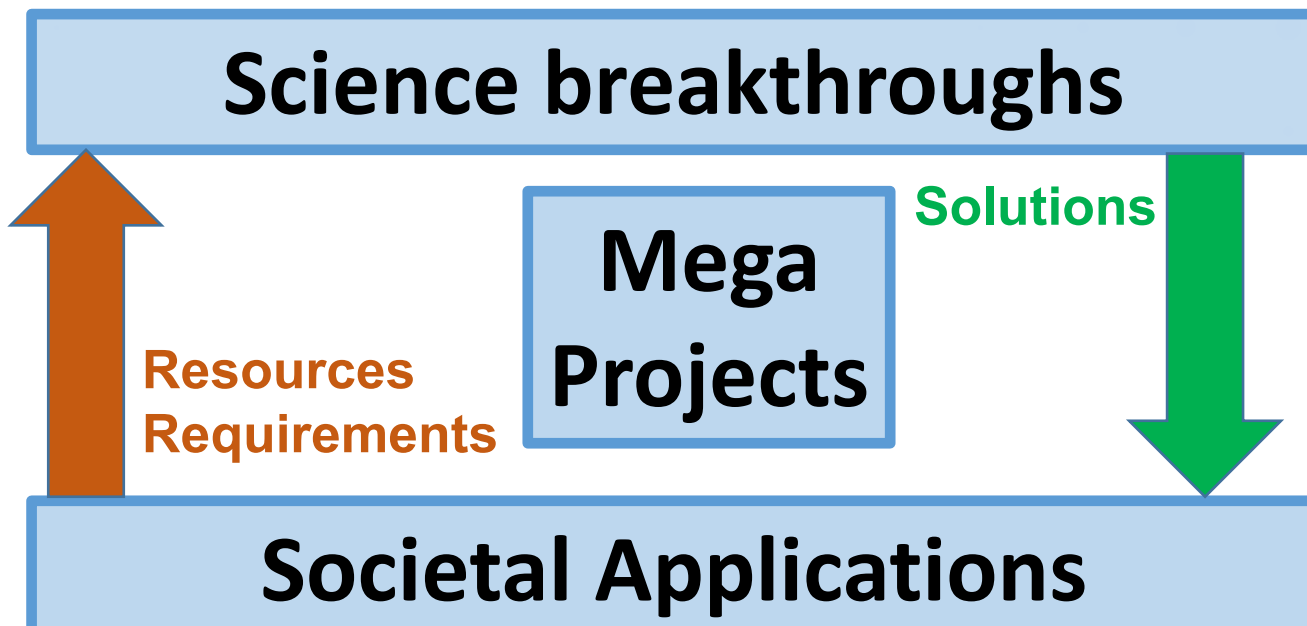
A safe Ocean

A sustainable & productive Ocean



A transparent & accessible Ocean

UN Decade of Ocean Science for Sustainable Development



- Mapping, digital atlas
- Observing system
- Ecosystem knowledge
- Data and Information
- Multi-Hazard Warning Systems
- Ocean in Earth System Science
- CD, Education, Ocean Literacy

Coastal zone management

Marine Spatial Planning/ Blue economy

Aquaculture / Fishery management

Disaster Risk Reduction (Re-)insurance

Adaptation Mitigation Climate services

Governance: Policies Peace Security

2021-2030 United Nations Decade of Ocean Science for Sustainable Development



InSight NASA Mission to Mars
26 November 2018
successful landing
USD 150 Million

Ocean Science accounts for
only between 0,04% and 4% of
total research and development
expenditures worldwide





United Nations
Educational, Scientific and
Cultural Organization



Intergovernmental
Oceanographic
Commission



2021
2030 United Nations Decade
of Ocean Science
for Sustainable Development

A global collective research and investment framework to close the knowledge gaps

GLOBAL KNOWLEDGE GAPS

99%

of habitable
marine areas lack
basic biodiversity
knowledge for their
management



3

Number of people
who have explored
the deepest known
point of the ocean

Only 5%

of the ocean floor
has been mapped
at high resolution



1 million

Approximate number of marine species
that could still be unknown to science



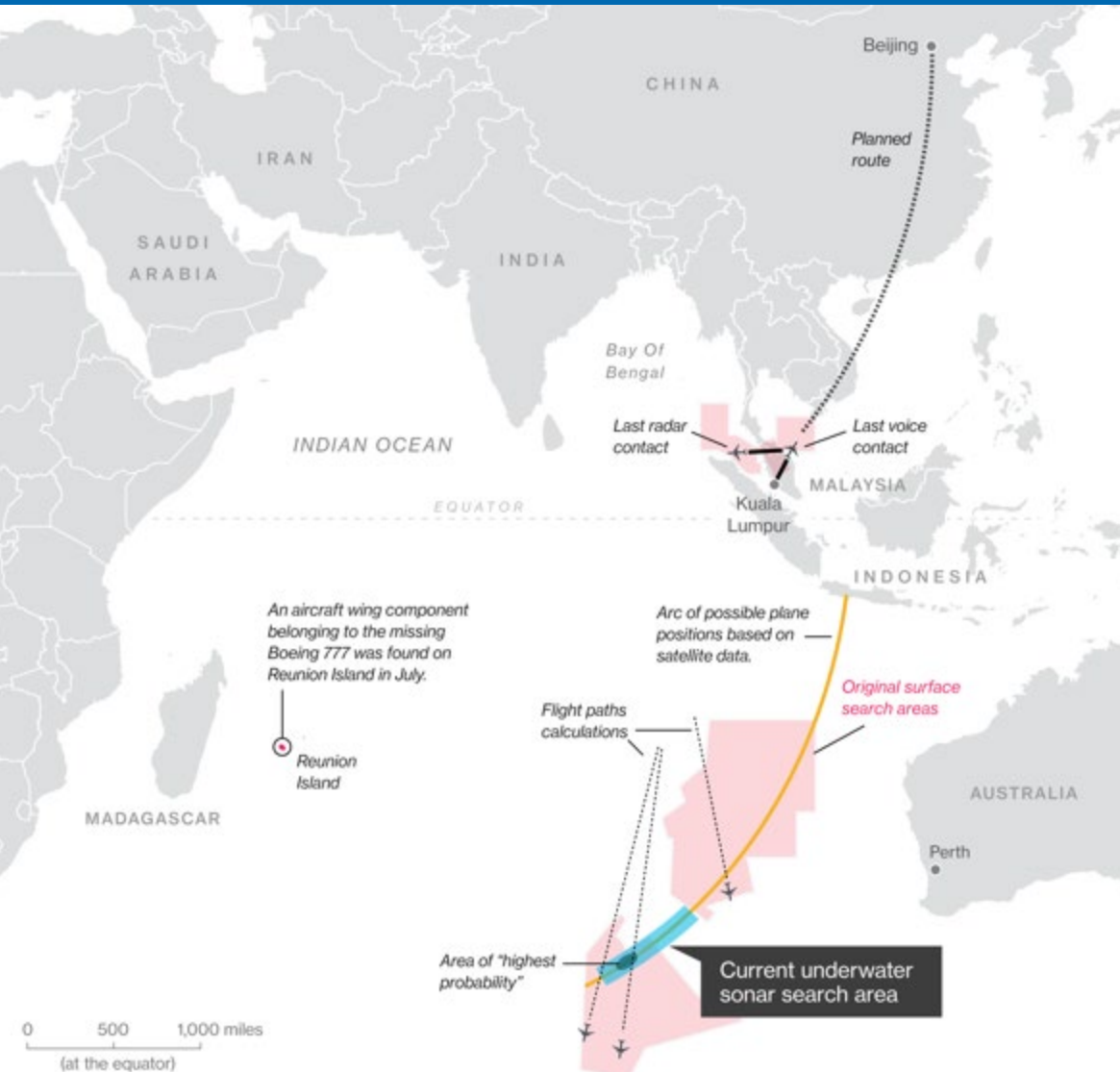
103 million

square miles of deep sea are
in perpetual darkness



IOC

UN Decade of Ocean Science for Sustainable Development Priority Research and Development Areas



R&D Priority Area 1:
Comprehensive map (digital atlas)
of the ocean

(Scope:
well beyond topography)

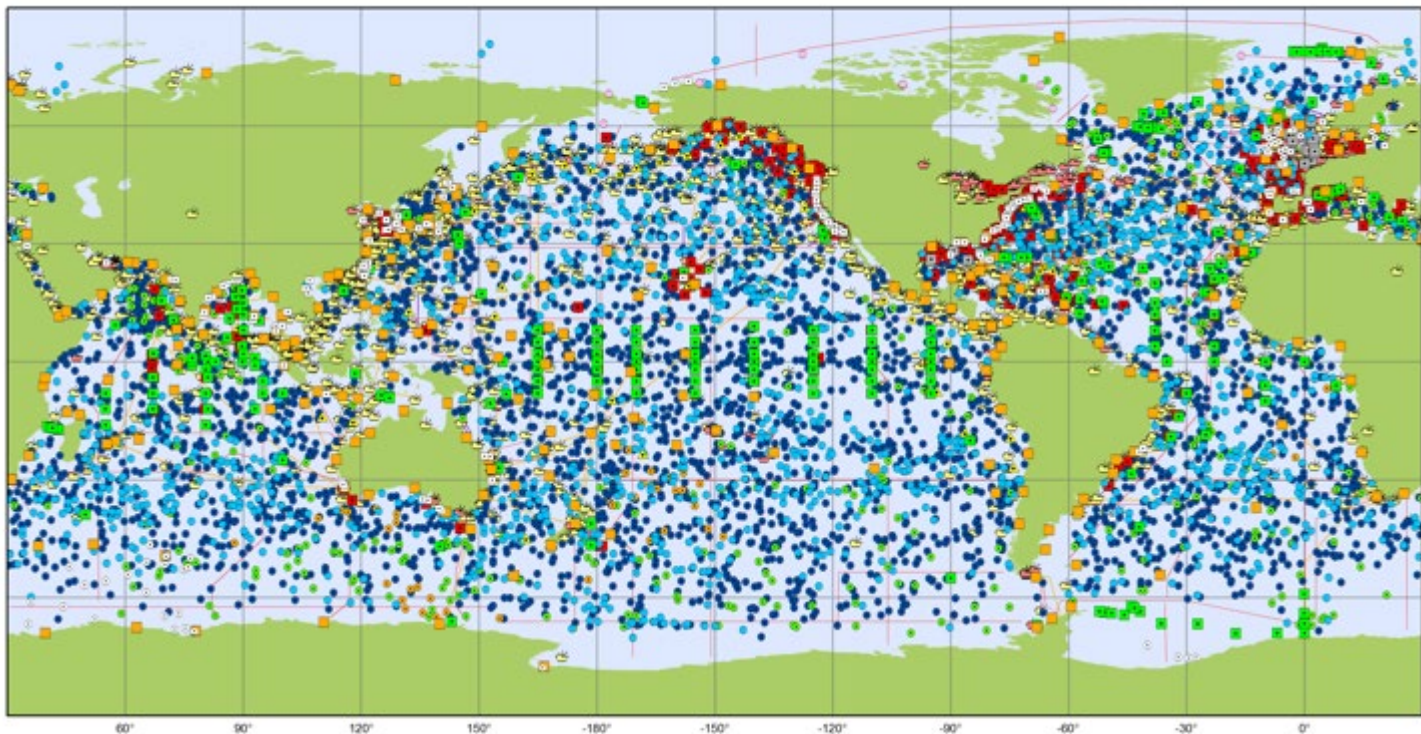


UN Decade of Ocean Science for Sustainable Development

Priority Research and Development Areas

R&D Priority Area 2:
A comprehensive ocean
observing system

(polar, bio, eco, BGC,
eDNA, deep ocean, +)



Main in situ Elements of the Global Ocean Observing System

April 2018

Profiling Floats (Argo)	Data Buoys (DBCP)	Timeseries (OceanSITES)	Ship based Measurements (SOT)	Other Networks
<ul style="list-style-type: none">Core (3815)Deep (57)BioGeoChemical (305)	<ul style="list-style-type: none">Surface Drifters (1408)Offshore Platforms (96)Ice Buoys (11)Moored Buoys (387)Tsunameters (32)	<ul style="list-style-type: none">Interdisciplinary Moorings (338)Repeated Hydrography (GO-SHIP)Research Vessel Lines (61)Sea Level (GLOSS)Tide Gauges (252)	<ul style="list-style-type: none">Automated Weather Stations (248)Manned Weather Stations (1767)Radiosondes (8)eXpendable BathyThermographs (37)	<ul style="list-style-type: none">HF Radars (270)Animal Borne Sensors (53)Ocean Gliders (31)

Generated by www.jcommops.org, 14/05/2018

UN Decade of Ocean Science for Sustainable Development Priority Research and Development Areas

Large Marine Ecosystems of the World and Linked Watersheds



- | | | | | | |
|-------------------------------------|-------------------------|---------------------------|--|----------------------|------------------|
| 1 East Bering Sea | 13 Humboldt Current | 25 Iberian Coastal | 37 Sulu-Celebes Sea | 48 Yellow Sea | 60 Faroe Plateau |
| 2 Gulf of Alaska | 14 Patagonian Shelf | 26 Mediterranean Sea | 38 Indonesian Sea | 49 Kuroshio Current | 61 Antarctic |
| 3 California Current | 15 South Brazil Shelf | 27 Canary Current | 39 North Australian Shelf | 50 Sea of Japan | 62 Black Sea |
| 4 Gulf of California | 16 East Brazil Shelf | 28 Guinea Current | 40 Northeast Australian Shelf-
Great Barrier Reef | 51 Oyashio Current | 63 Hudson Bay |
| 5 Gulf of Mexico | 17 North Brazil Shelf | 29 Benguela Current | 41 East-Central Australian Shelf | 52 Okhotsk Sea | 64 Arctic Ocean |
| 6 Southeast U.S. Continental Shelf | 18 West Greenland Shelf | 30 Agulhas Current | 42 Southeast Australian Shelf | 53 West Bering Sea | |
| 7 Northeast U.S. Continental Shelf | 19 East Greenland Shelf | 31 Somali Coastal Current | 43 Southwest Australian Shelf | 54 Chukchi Sea | |
| 8 Scotian Shelf | 20 Barents Sea | 32 Arabian Sea | 44 West-Central Australian Shelf | 55 Beaufort Sea | |
| 9 Newfoundland-Labrador Shelf | 21 Norwegian Shelf | 33 Red Sea | 45 Northwest Australian Shelf | 56 East Siberian Sea | |
| 10 Insular Pacific-Hawaiian | 22 North Sea | 34 Bay of Bengal | 46 New Zealand Shelf | 57 Laptev Sea | |
| 11 Pacific Central-American Coastal | 23 Baltic Sea | 35 Gulf of Thailand | 47 East China Sea | 58 Kara Sea | |
| 12 Caribbean Sea | 24 Celtic-Biscay Shelf | 36 South China Sea | | 59 Iceland Shelf | |

R&D Priority Area 3:

A quantitative understanding of ocean ecosystems as the basis for their integrated ocean management

(multiple stressors, deep ocean, bottom, predictive, assisted adaptation, e.g. of coral reef ecosystem)



UN Decade of Ocean Science for Sustainable Development Priority Research and Development Areas



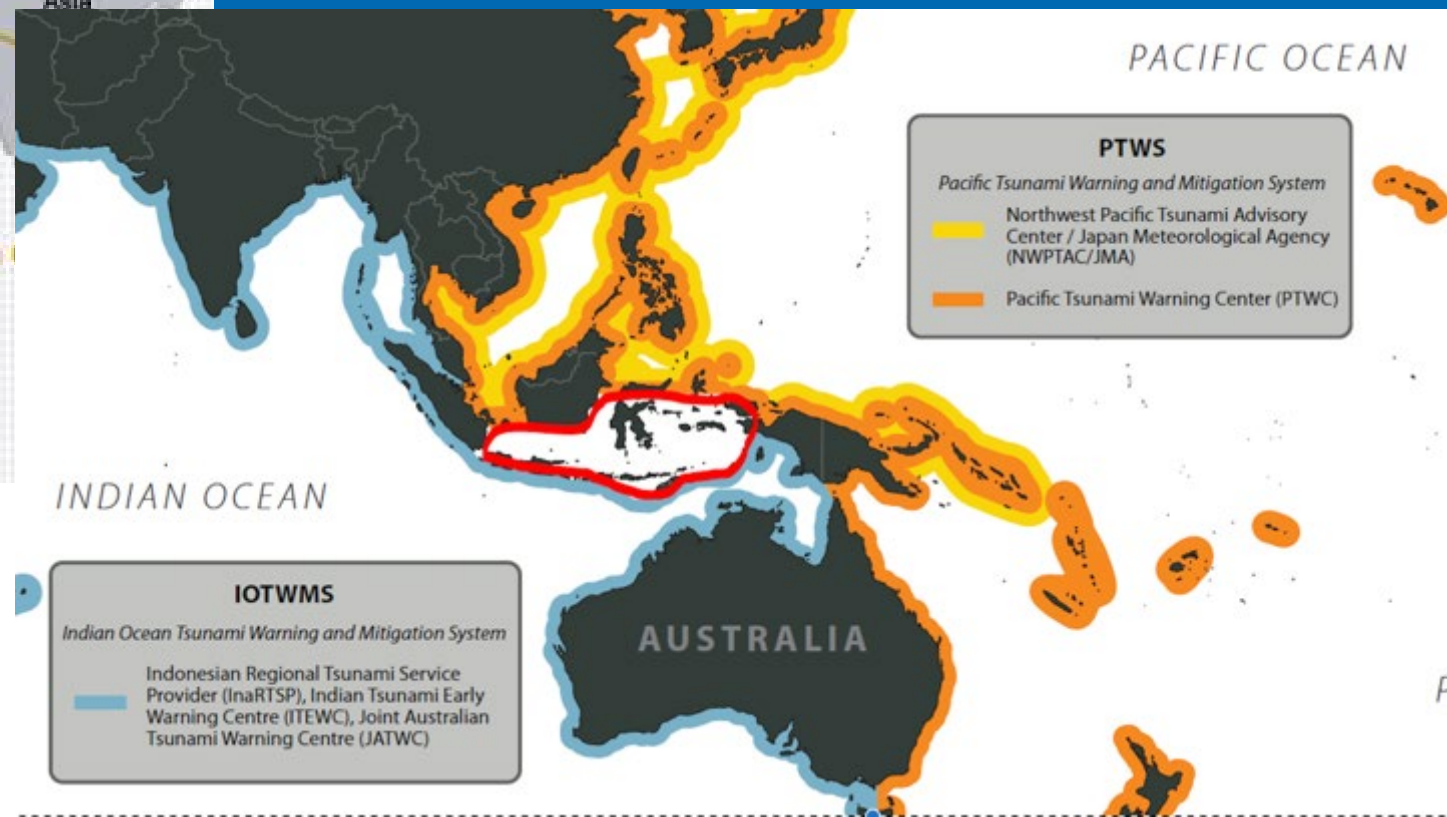
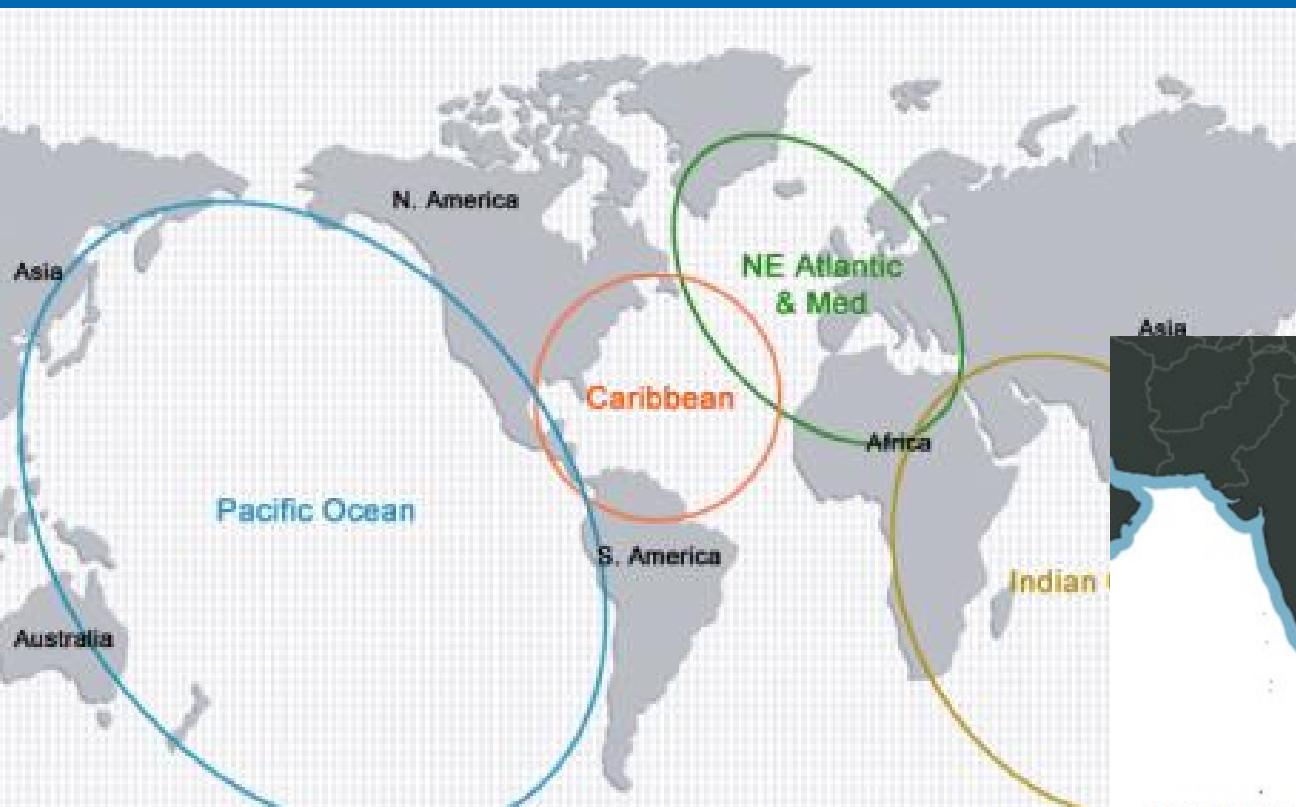
R&D Priority Area 4: Data & information System



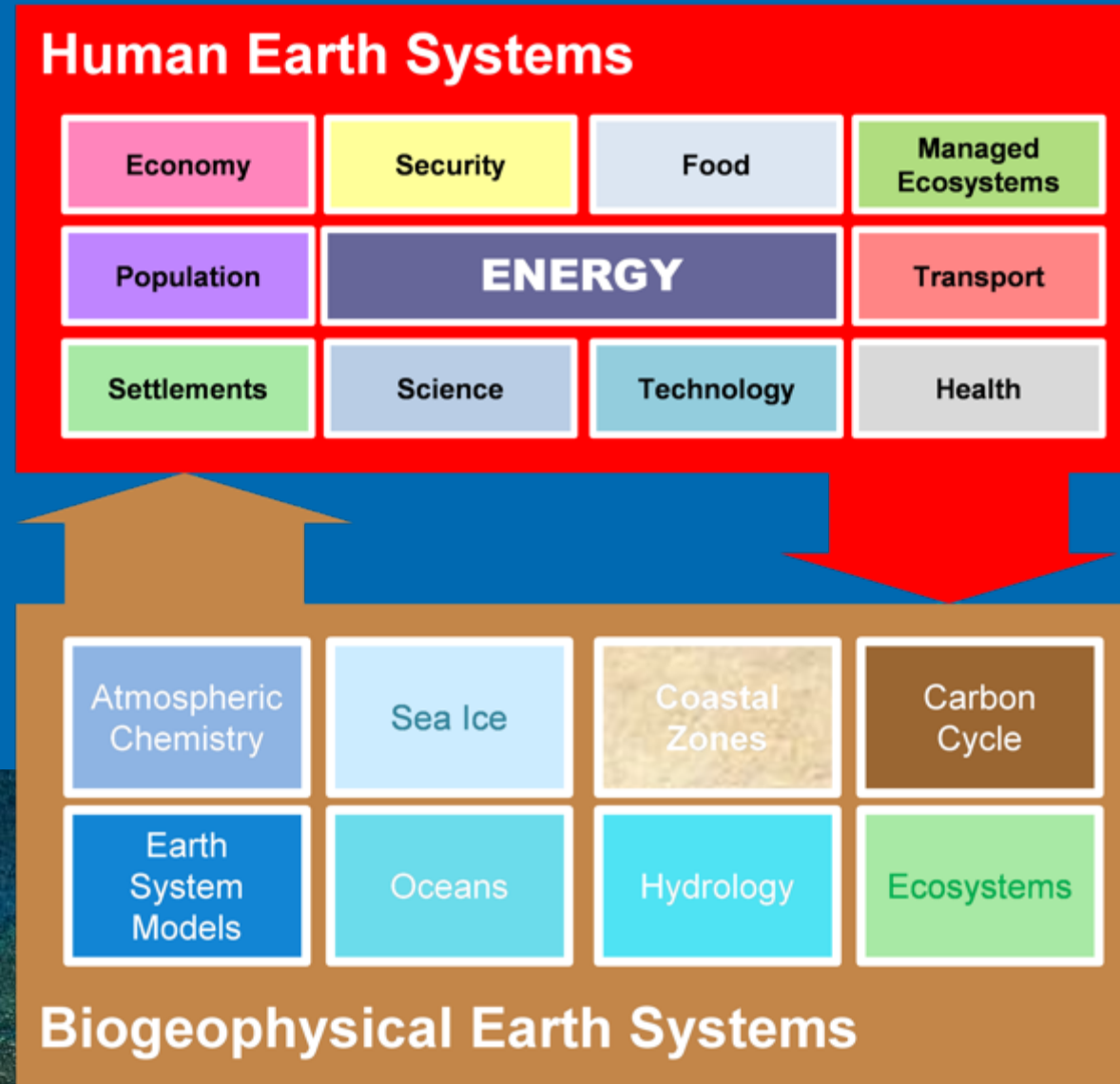


UN Decade of Ocean Science for Sustainable Development Priority Research and Development Areas

R&D Priority Area 5: Ocean dimension in an integrated multi-hazard warning system



UN Decade of Ocean Science for Sustainable Development Priority Research and Development Areas



**R&D Priority Area 6:
Ocean compartment
of the Earth System**

**(The only way to
climate prediction)**



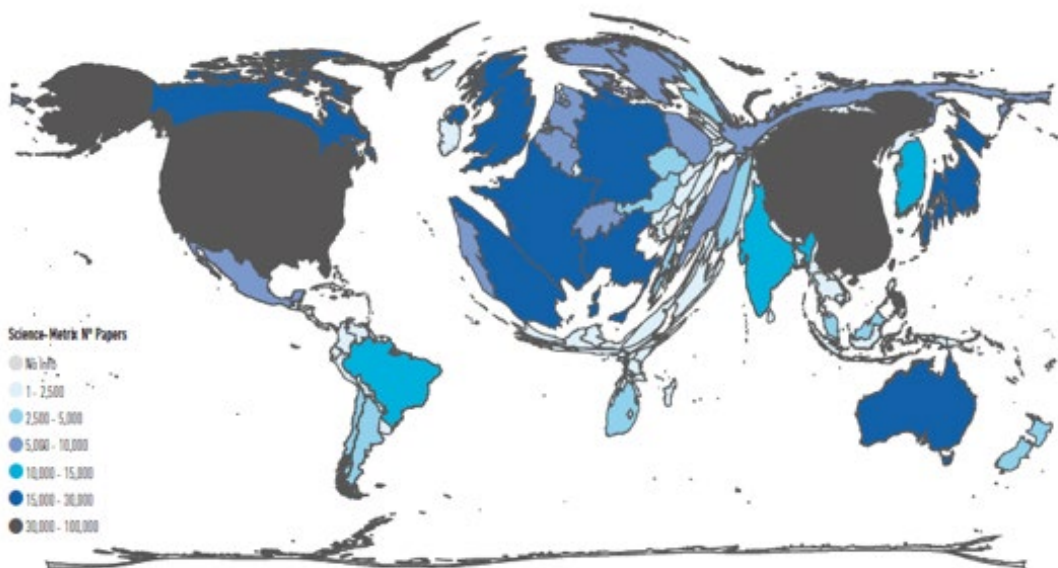
UN Decade of Ocean Science for Sustainable Development Priority Research and Development Areas



“FAR AND AWAY, THE GREATEST THREAT TO THE OCEAN, AND THUS TO OURSELVES, IS **IGNORANCE**”.

Sylvia Earle, President of [Mission Blue](#)

R&D Priority Area 7: Capacity Development Education and Training Ocean Literacy



The Current Status of Ocean Science around the World



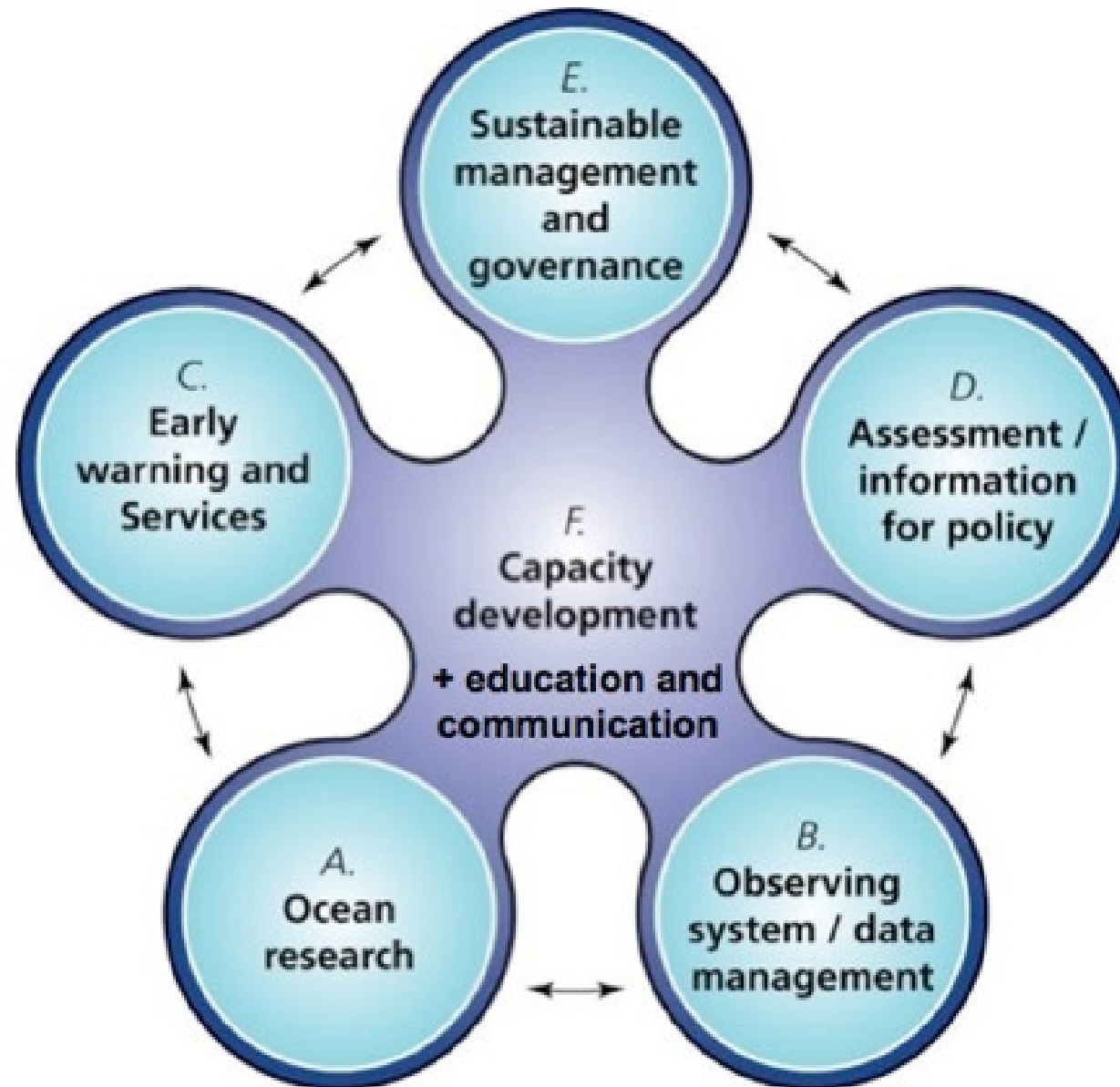
IOC Functions and Portfolio



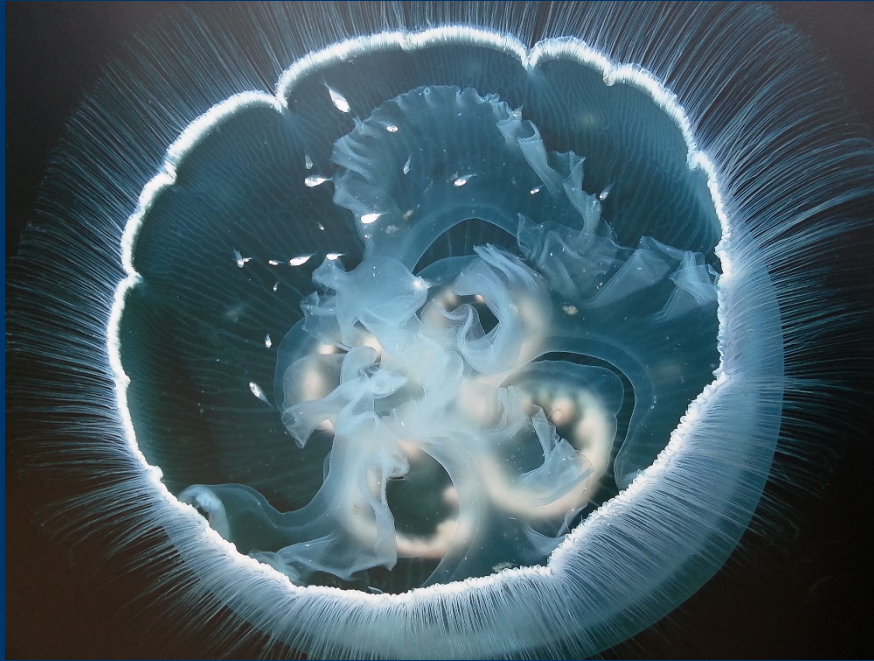
Nations
ific and
nization



Intergovernmental
Oceanographic
Commission



IOC of UNESCO and ISA have a unique opportunity of partnering with the **INDUSTRY**



Major players in ocean sciences research & development:

- Universities and research institutions
- **Government**
 - National and local departments
- **The industry**
- NGOs
- Regional inter-governmental organizations (IGOs)
- UN organizations and their regional offices
- International Organisations




IOC and ISA Partnerships & Cooperation



United Nations
Educational, Scientific and
Cultural Organization



Intergovernmental
Oceanographic
Commission


 **UNITED NATIONS**

HOME | SDG 14 | ABOUT THE CONFERENCE | CALL FOR ACTION | VOLUNTARY COMMITMENTS | COMMUNITIES OF OCEAN ACTION | PREP PR

REGISTRY | COMMUNITIES OF OCEAN ACTION | REGISTER COMMITMENT | SHARE UPDATE | ABOUT & RESOURCES

Improving the assessment of essential ecological functions of the deep sea oceans through long-term underwater oceanographic observatories in the Area.

by [International Seabed Authority](#) (Intergovernmental organization)

 **UNITED NATIONS**

HOME | SDG 14 | ABOUT THE CONFERENCE | CALL FOR ACTION | VOLUNTARY COMMITMENTS | COMMUNITIES OF OCEAN ACTION | PREP PROCESS

REGISTRY | COMMUNITIES OF OCEAN ACTION | REGISTER COMMITMENT | SHARE UPDATE | ABOUT & RESOURCES

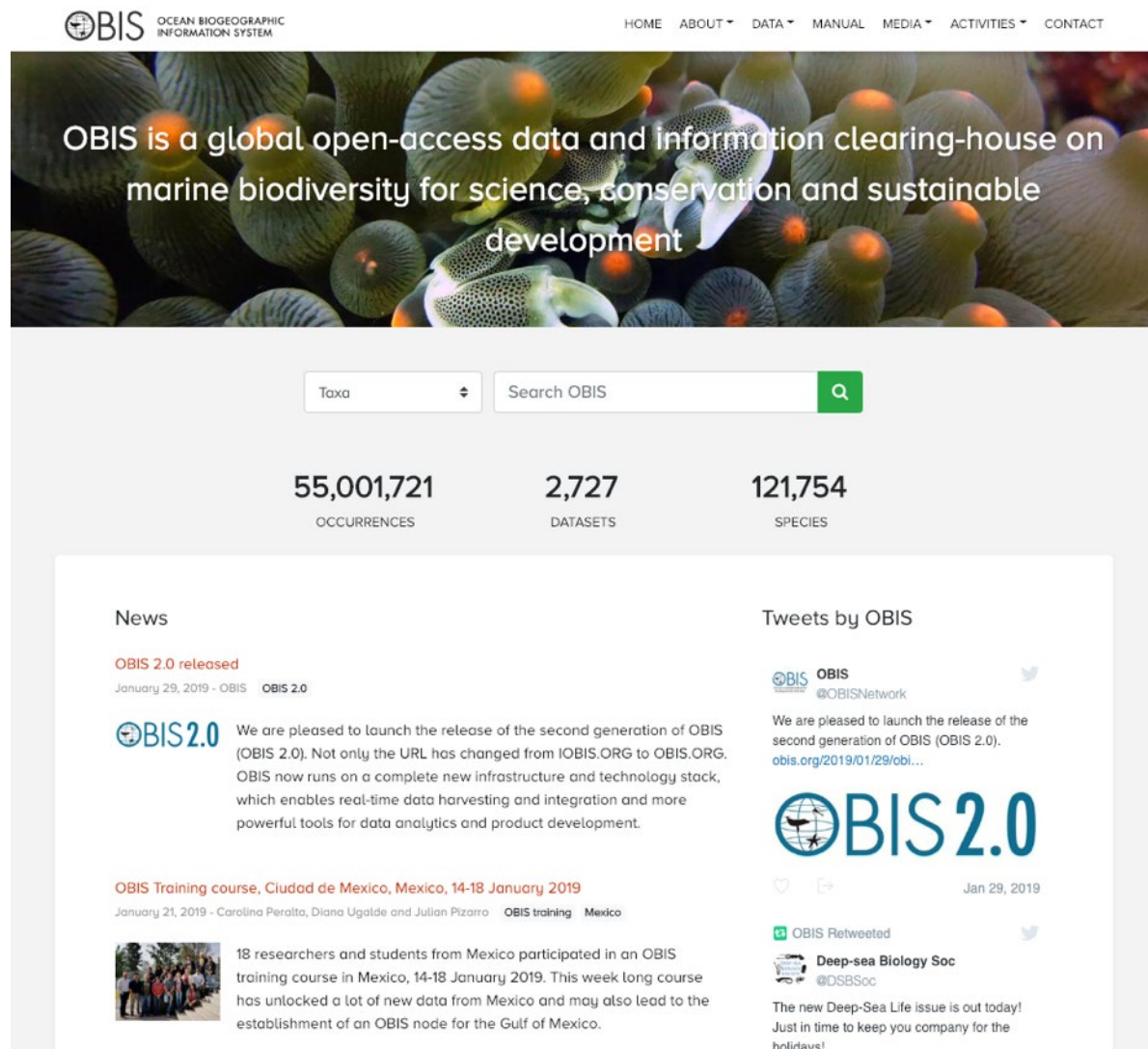
Enhancing deep sea marine biodiversity assessment through the creation of online taxonomic atlases linked to deep sea mining activities in the Area.

by [International Seabed Authority](#) (Intergovernmental organization)

OBIS Ocean Biogeographic Information System

obis.org

Provide the world's largest scientific knowledge base on the diversity, distribution and abundance of all marine organisms in an integrated and standardized format



The screenshot shows the OBIS website homepage. At the top, there is a navigation menu with links for HOME, ABOUT, DATA, MANUAL, MEDIA, ACTIVITIES, and CONTACT. Below the navigation is a large banner image of a coral reef with a white fish. The banner text reads: "OBIS is a global open-access data and information clearing-house on marine biodiversity for science, conservation and sustainable development". Below the banner is a search bar with a dropdown menu for "Taxa" and a search button. Below the search bar are three statistics: 55,001,721 OCCURRENCES, 2,727 DATASETS, and 121,754 SPECIES. Below the statistics are two columns of content: "News" and "Tweets by OBIS". The "News" column contains two items: "OBIS 2.0 released" and "OBIS Training course, Ciudad de Mexico, Mexico, 14-18 January 2019". The "Tweets by OBIS" column contains two tweets: one from @OBISNetwork about the release of OBIS 2.0, and one from @DSBSoc about the new Deep-Sea Life issue.

OBIS OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM

HOME ABOUT DATA MANUAL MEDIA ACTIVITIES CONTACT

OBIS is a global open-access data and information clearing-house on marine biodiversity for science, conservation and sustainable development

Taxa Search OBIS

55,001,721 OCCURRENCES 2,727 DATASETS 121,754 SPECIES

News

OBIS 2.0 released
January 29, 2019 - OBIS [OBIS 2.0](#)

OBIS 2.0 We are pleased to launch the release of the second generation of OBIS (OBIS 2.0). Not only the URL has changed from IOBIS.ORG to OBIS.ORG. OBIS now runs on a complete new infrastructure and technology stack, which enables real-time data harvesting and integration and more powerful tools for data analytics and product development.

OBIS Training course, Ciudad de Mexico, Mexico, 14-18 January 2019
January 21, 2019 - Carolina Peralta, Diana Ugalde and Julian Pizarro [OBIS training](#) [Mexico](#)

18 researchers and students from Mexico participated in an OBIS training course in Mexico, 14-18 January 2019. This week long course has unlocked a lot of new data from Mexico and may also lead to the establishment of an OBIS node for the Gulf of Mexico.

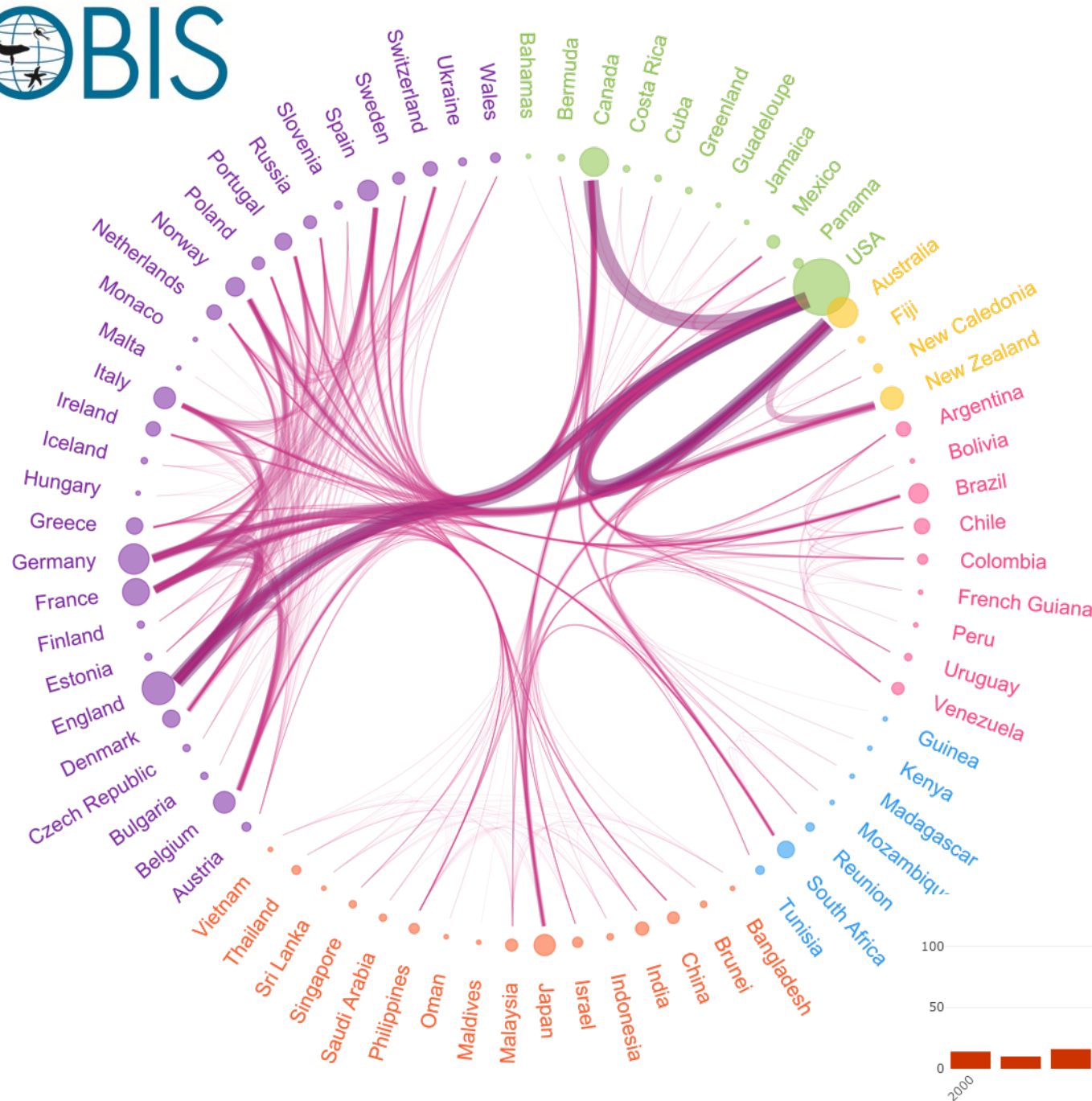
Tweets by OBIS

OBIS @OBISNetwork
We are pleased to launch the release of the second generation of OBIS (OBIS 2.0).
obis.org/2019/01/29/obi...
Jan 29, 2019

OBIS Retweeted

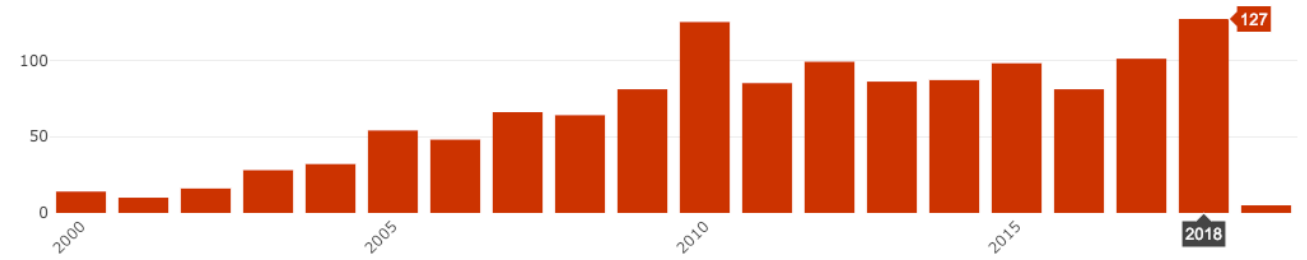
Deep-sea Biology Soc @DSBSoc
The new Deep-Sea Life issue is out today!
Just in time to keep you company for the holidays!

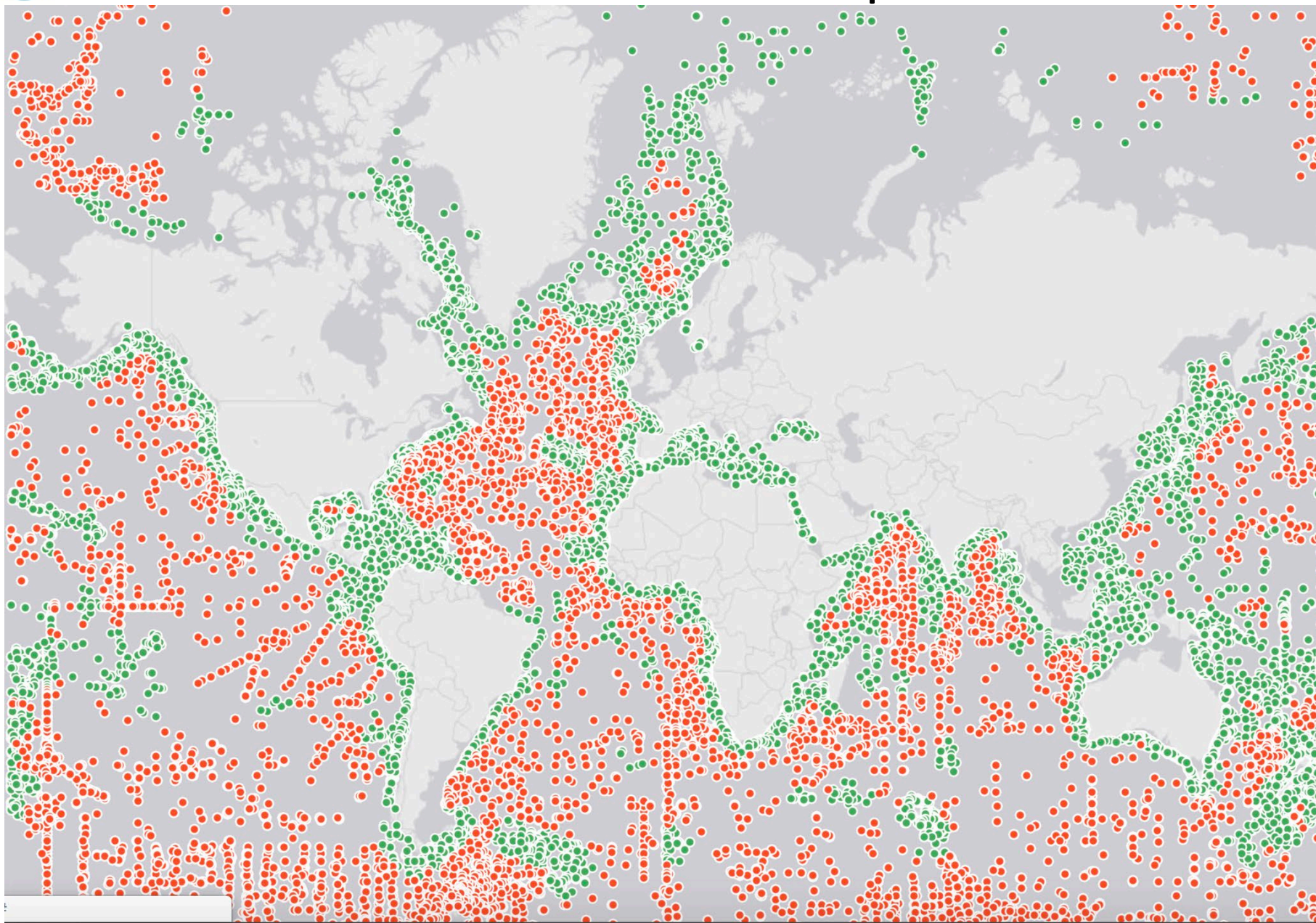




Open-access to research data supports equitable access and benefit sharing and enhances international collaboration

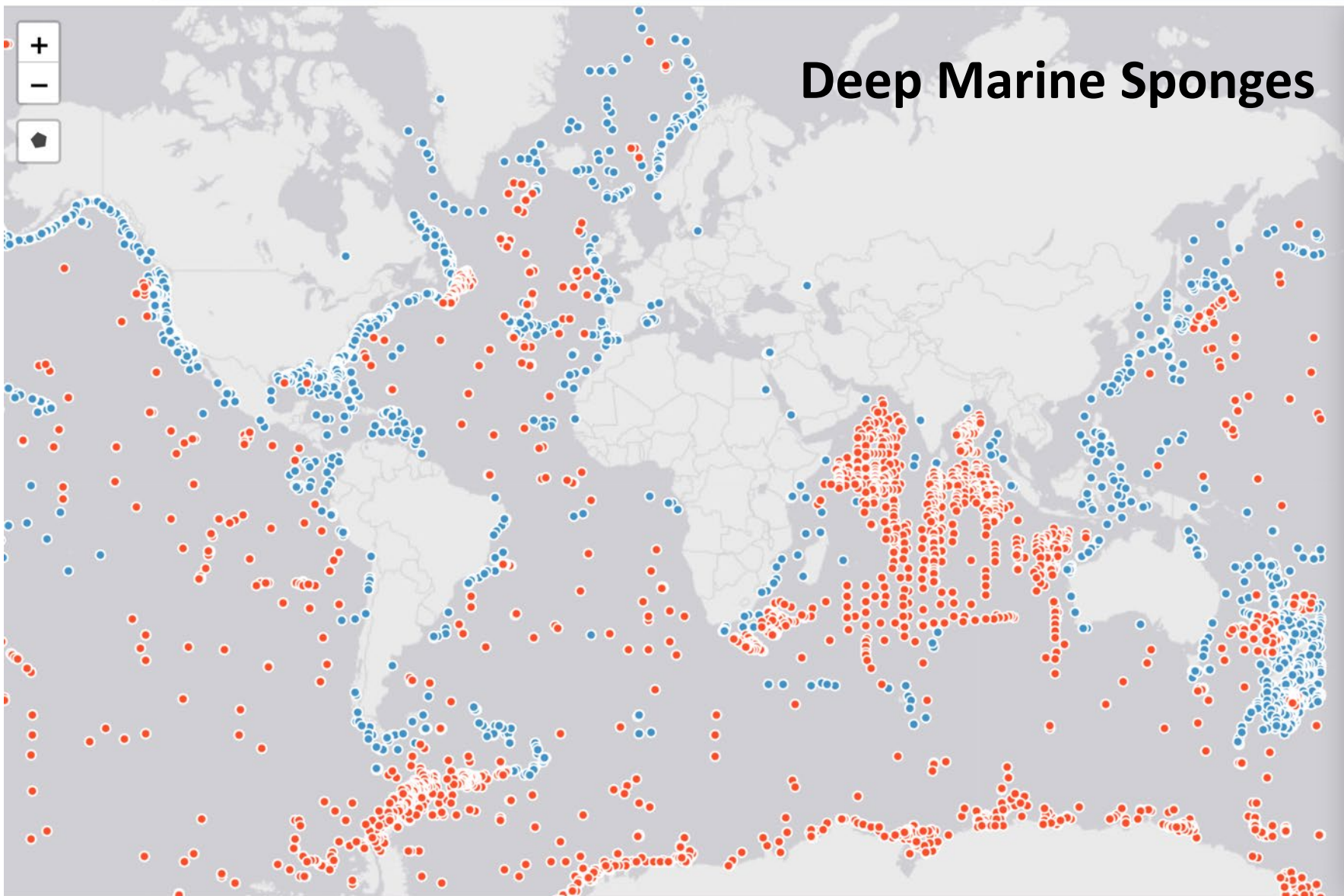
- 1300 papers
- 2700 authors
- 72 countries





500 →
excluded: bath_issue
1,505,358 records

area 1 ABNJ
500 →
361,187 records



Deep Marine Sponges

Layers

- Porifera Grant, 1836
 500 →
 42,566 records
- Porifera Grant, 1836
 area 1 ABNJ
 16,188 records

Within EEZ

In ABNJ

SUMMARY

records	species	taxa	years
42,566	1,435	1,726	1860 - 2017

records	species	taxa	years
16,188	763	1,045	1839 - 2017



Supporting international processes

The 27th IOC Assembly (2015) encouraged increased participation of IOC in the work of IPBES through OBIS and other relevant IOC programmes (IOC-XXVIII/Dec.6.1).



OBIS OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM

HOME ABOUT MAPPER DATA MANUAL GOVERNANCE SPONSOR LIBRARY CONTACT

Map production

IPBES Regional assessments

Asian Pacific

Based on the [indicator maps](#), output maps for different indicators were prepared using the Sphere_Robinson Pacific Central Meridian projection in Quantum GIS with 5° and 1° degree grid cells. More information on the different indicators can be found in the [documentation](#).

- September 2017
 - Output maps as jpg (29 MB)
 - Output maps as pdf (1.52 GB)
 - Quantum GIS projects (187 MB)
 - 5° maps:

Indicator	Legend Values
Number of records	0-10, 11-20, 21-30, 31-40, 41-50, 51-60, 61-70, 71-80, 81-90, 91-100, 101-110, 111-120, 121-130, 131-140, 141-150, 151-160, 161-170, 171-180, 181-190, 191-200, 201-210, 211-220, 221-230, 231-240, 241-250, 251-260, 261-270, 271-280, 281-290, 291-300, 301-310, 311-320, 321-330, 331-340, 341-350, 351-360, 361-370, 371-380, 381-390, 391-400, 401-410, 411-420, 421-430, 431-440, 441-450, 451-460, 461-470, 471-480, 481-490, 491-500, 501-510, 511-520, 521-530, 531-540, 541-550, 551-560, 561-570, 571-580, 581-590, 591-600, 601-610, 611-620, 621-630, 631-640, 641-650, 651-660, 661-670, 671-680, 681-690, 691-700, 701-710, 711-720, 721-730, 731-740, 741-750, 751-760, 761-770, 771-780, 781-790, 791-800, 801-810, 811-820, 821-830, 831-840, 841-850, 851-860, 861-870, 871-880, 881-890, 891-900, 901-910, 911-920, 921-930, 931-940, 941-950, 951-960, 961-970, 971-980, 981-990, 991-1000
Red List species	0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, 24-25, 25-26, 26-27, 27-28, 28-29, 29-30, 30-31, 31-32, 32-33, 33-34, 34-35, 35-36, 36-37, 37-38, 38-39, 39-40, 40-41, 41-42, 42-43, 43-44, 44-45, 45-46, 46-47, 47-48, 48-49, 49-50, 50-51, 51-52, 52-53, 53-54, 54-55, 55-56, 56-57, 57-58, 58-59, 59-60, 60-61, 61-62, 62-63, 63-64, 64-65, 65-66, 66-67, 67-68, 68-69, 69-70, 70-71, 71-72, 72-73, 73-74, 74-75, 75-76, 76-77, 77-78, 78-79, 79-80, 80-81, 81-82, 82-83, 83-84, 84-85, 85-86, 86-87, 87-88, 88-89, 89-90, 90-91, 91-92, 92-93, 93-94, 94-95, 95-96, 96-97, 97-98, 98-99, 99-100
Red List number	0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, 24-25, 25-26, 26-27, 27-28, 28-29, 29-30, 30-31, 31-32, 32-33, 33-34, 34-35, 35-36, 36-37, 37-38, 38-39, 39-40, 40-41, 41-42, 42-43, 43-44, 44-45, 45-46, 46-47, 47-48, 48-49, 49-50, 50-51, 51-52, 52-53, 53-54, 54-55, 55-56, 56-57, 57-58, 58-59, 59-60, 60-61, 61-62, 62-63, 63-64, 64-65, 65-66, 66-67, 67-68, 68-69, 69-70, 70-71, 71-72, 72-73, 73-74, 74-75, 75-76, 76-77, 77-78, 78-79, 79-80, 80-81, 81-82, 82-83, 83-84, 84-85, 85-86, 86-87, 87-88, 88-89, 89-90, 90-91, 91-92, 92-93, 93-94, 94-95, 95-96, 96-97, 97-98, 98-99, 99-100
Number of phyto	0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, 24-25, 25-26, 26-27, 27-28, 28-29, 29-30, 30-31, 31-32, 32-33, 33-34, 34-35, 35-36, 36-37, 37-38, 38-39, 39-40, 40-41, 41-42, 42-43, 43-44, 44-45, 45-46, 46-47, 47-48, 48-49, 49-50, 50-51, 51-52, 52-53, 53-54, 54-55, 55-56, 56-57, 57-58, 58-59, 59-60, 60-61, 61-62, 62-63, 63-64, 64-65, 65-66, 66-67, 67-68, 68-69, 69-70, 70-71, 71-72, 72-73, 73-74, 74-75, 75-76, 76-77, 77-78, 78-79, 79-80, 80-81, 81-82, 82-83, 83-84, 84-85, 85-86, 86-87, 87-88, 88-89, 89-90, 90-91, 91-92, 92-93, 93-94, 94-95, 95-96, 96-97, 97-98, 98-99, 99-100
Species index	0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, 24-25, 25-26, 26-27, 27-28, 28-29, 29-30, 30-31, 31-32, 32-33, 33-34, 34-35, 35-36, 36-37, 37-38, 38-39, 39-40, 40-41, 41-42, 42-43, 43-44, 44-45, 45-46, 46-47, 47-48, 48-49, 49-50, 50-51, 51-52, 52-53, 53-54, 54-55, 55-56, 56-57, 57-58, 58-59, 59-60, 60-61, 61-62, 62-63, 63-64, 64-65, 65-66, 66-67, 67-68, 68-69, 69-70, 70-71, 71-72, 72-73, 73-74, 74-75, 75-76, 76-77, 77-78, 78-79, 79-80, 80-81, 81-82, 82-83, 83-84, 84-85, 85-86, 86-87, 87-88, 88-89, 89-90, 90-91, 91-92, 92-93, 93-94, 94-95, 95-96, 96-97, 97-98, 98-99, 99-100
ESDG index	0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, 24-25, 25-26, 26-27, 27-28, 28-29, 29-30, 30-31, 31-32, 32-33, 33-34, 34-35, 35-36, 36-37, 37-38, 38-39, 39-40, 40-41, 41-42, 42-43, 43-44, 44-45, 45-46, 46-47, 47-48, 48-49, 49-50, 50-51, 51-52, 52-53, 53-54, 54-55, 55-56, 56-57, 57-58, 58-59, 59-60, 60-61, 61-62, 62-63, 63-64, 64-65, 65-66, 66-67, 67-68, 68-69, 69-70, 70-71, 71-72, 72-73, 73-74, 74-75, 75-76, 76-77, 77-78, 78-79, 79-80, 80-81, 81-82, 82-83, 83-84, 84-85, 85-86, 86-87, 87-88, 88-89, 89-90, 90-91, 91-92, 92-93, 93-94, 94-95, 95-96, 96-97, 97-98, 98-99, 99-100
Sampling effort	0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-16, 16-17, 17-18, 18-19, 19-20, 20-21, 21-22, 22-23, 23-24, 24-25, 25-26, 26-27, 27-28, 28-29, 29-30, 30-31, 31-32, 32-33, 33-34, 34-35, 35-36, 36-37, 37-38, 38-39, 39-40, 40-41, 41-42, 42-43, 43-44, 44-45, 45-46, 46-47, 47-48, 48-49, 49-50, 50-51, 51-52, 52-53, 53-54, 54-55, 55-56, 56-57, 57-58, 58-59, 59-60, 60-61, 61-62, 62-63, 63-64, 64-65, 65-66, 66-67, 67-68, 68-69, 69-70, 70-71, 71-72, 72-73, 73-74, 74-75, 75-76, 76-77, 77-78, 78-79, 79-80, 80-81, 81-82, 82-83, 83-84, 84-85, 85-86, 86-87, 87-88, 88-89, 89-90, 90-91, 91-92, 92-93, 93-94, 94-95, 95-96, 96-97, 97-98, 98-99, 99-100



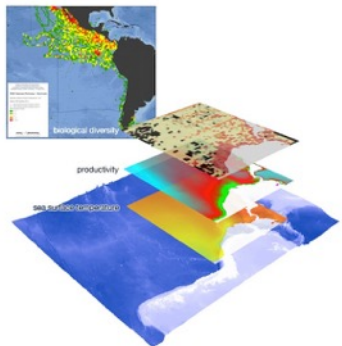
Supporting international processes

CBD decision X/29, para 35

Requests ... UNESCO-IOC, in particular the Ocean Biogeographic Information System (OBIS), .. and others... to facilitate availability and inter-operability of the best available marine and coastal biodiversity data sets and information across global, regional and national scales.



Data portal



Ecologically or Biologically Significant Marine Areas
Special places in the world's oceans

HOME ABOUT EBSAs MEETINGS RESOURCES COLLABORATORS

View Areas Meeting the EBSA Criteria

All Regions

- Arctic
- East Asian Seas
- Eastern Tropical and Temperate Pacific
- Mediterranean
- North Pacific
- North-East Indian Ocean
- North-west Atlantic
- North-West Indian Ocean and Adjacent Gulf Areas
- South-Eastern Atlantic
- Southern Indian Ocean
- Western South Pacific
- Wider Caribbean and Western Mid-Atlantic

Satellite

Corridor Marino to mapper

STATISTICS

Occurrence records	64,003
> Species level	55,976
Species	2,762
Taxa	3,575
Datasets	104
Time range	1866 - 2017

DISTRIBUTION

Disclaimer: EEZ boundaries based on Marine Regions (no endorsement).

RECORDS

COMPOSITION

detailed (class) simple

DATA QUALITY

DROPPED RECORDS

Dropped records	668
> Not marine	86
> No WoRMS match	582
> No coordinates	0
> Zero coordinates	0

TAXONOMIC ISSUES

Marine unsure	214
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MISSING AND INVALID FIELDS

Field	Missing	Invalid
coordinateUncertaintyInMeters	64,346	116
eventDate	19,492	0
maximumDepthInMeters	56,023	21
minimumDepthInMeters	54,202	21
occurrenceStatus	27,203	1,701
scientificNameID	692	134

SPATIAL ISSUES

Records on land	5,867
> More than 20 km from shore	0
Depth exceeds bathymetric depth	885



The Nippon Foundation-GEBCO Seabed 2030 Project

Deep ocean bathymetry is important for resource exploration and exploitation, cable routes, fisheries management, the juridical extension of continental shelves, military and defence applications, and is a fundamental data set for confronting the growing challenges associated with climate change.



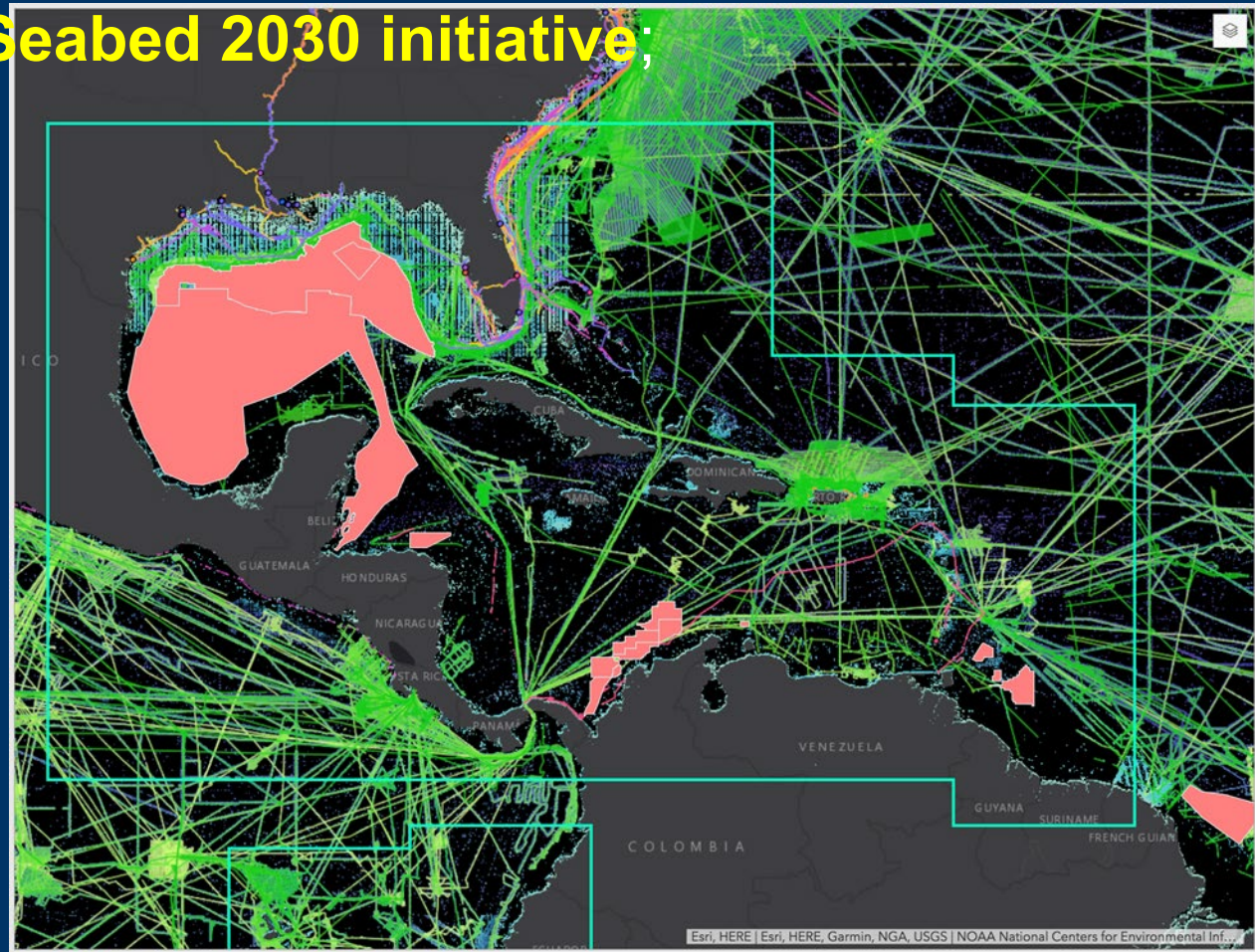
The Nippon Foundation-GEBCO Seabed 2030 Project

Bathymetry from the deep ocean is critical for a wide variety of scientific applications including:

- marine geology and geophysical studies of global tectonics and sediment transport,
- habitat, biodiversity and biogeography studies,
- understanding circulation patterns that relate to regional and global ocean-atmosphere (climate) processes, and
- numerical modelling for forecasting at different temporal and spatial scales including tsunami propagation.

Only a small portion of the ocean has been mapped with direct measurement;

About 50% of the world's coastal waters remain unsurveyed--
IOC of UNESCO and **ISA** have a role in increasing contributions to the **Seabed 2030 initiative**;



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감사합니다!

¡Muchas gracias!

Merci beaucoup!

Thank you!

شُكْرًا

Спасибо

谢谢



IOC