



18th Global Meeting of Regional Seas Conventions and Action plans

United Nations
Educational, Scientific and
Cultural Organization

Organisation
des Nations Unies
pour l'éducation
la science et la culture

Organización
de las Naciones Unidas
para la Educación
la Ciencia y la Cultura

Организация
Объединенных Наций по
вопросам образования
науки и культуры

Intergovernmental
Oceanographic
Commission

Commission
océanographique
intergouvernementale

Comisión
Oceanográfica
Intergubernamental

Межправительственная
океанографическая
комиссия

SDG 14 and the role of Science and Capacity Development



Marine Policy and Regional Coordination Section
Section de Politique Maritime et de la Coordination Régionale
Sección de Política Marítima y de Coordinación Regional
Морская политика и Региональная координация

Julian Barbière
Head, IOC-UNESCO / MPR
Incheon (Korea)
September 2016



The Intergovernmental Oceanographic Commission of UNESCO

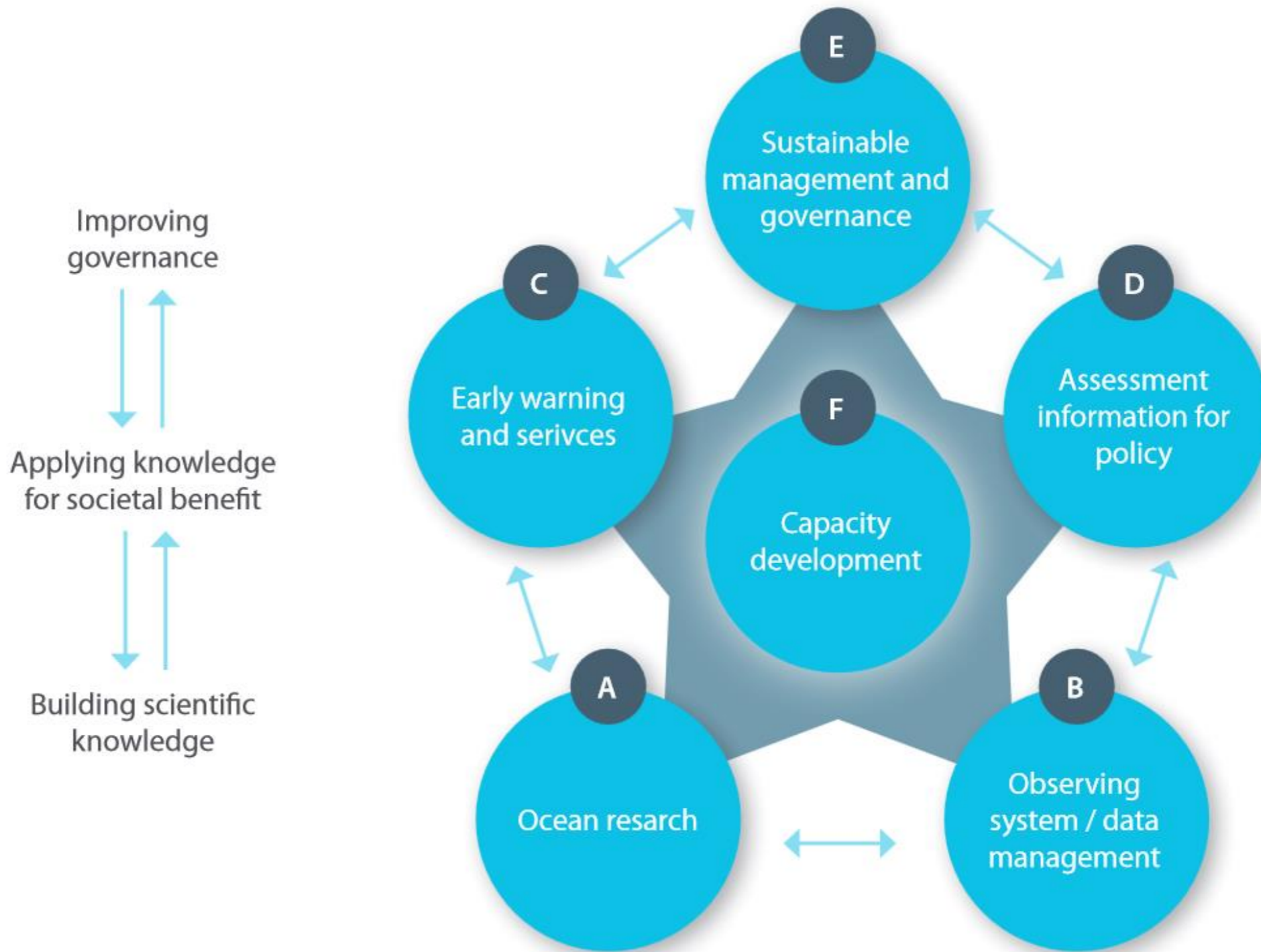


IOC: Building knowledge and capacity for sustainable ocean management

- Only intergovernmental organization mandated to promote marine science in all ocean basins
- Science, services, observations, data exchange and capacity development
- Apply knowledge to sustainable development of the marine environment



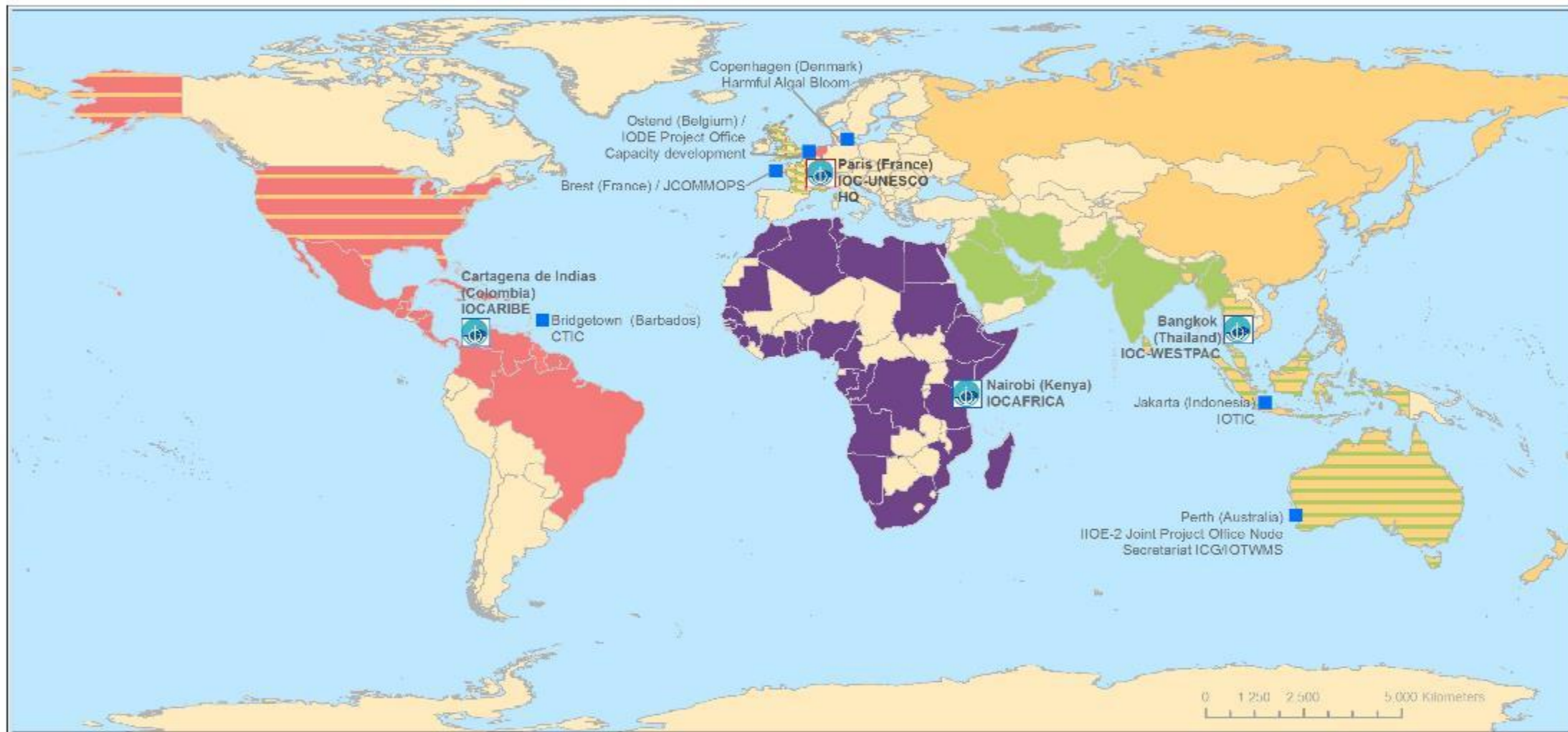
IOC Medium-Term Strategy



We provide regional technical scientific networks to promote applied ocean sciences



Intergovernmental Oceanographic Commission of UNESCO IOC Sub-commissions, Programme and Project Offices



IOC-UNESCO/MPR, 2016

The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the IOC-UNESCO.

- IOCAFRICA Member States
- IOCARIBE Member States
- IOCINDIO Member States
- IOC-WESTPAC Member States
- IOC-UNESCO Secretariat
- IOC Sub-Commissions
- IOC Programme and Project Offices



17 objectives to transform our world: Agenda 2030



230 Global Indicators have been agreed

Definition of the three indicators tiers

Tier 1: Indicator conceptually clear, established methodology and standards available and data regularly produced by countries.

Tier 2: Indicator conceptually clear, established methodology and standards available but data are not regularly produced by countries.

Tier 3: Indicator for which there are no established methodology and standards or methodology/standards are being developed/tested.

Most SDG 14 indicators !!

Tier classification for SDG14 Indicators

Target	Indicator	Tier	Lead agencies
14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from landbased activities, including marine debris and nutrient pollution	14.1.1 Index of coastal eutrophication and floating plastic debris density	III	UNEP IOC/UNESCO
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	14.2.1 Proportion of national exclusive economic zones managed using ecosystem-based approaches	III	UNEP IOC/UNESCO
14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels	14.3.1 Average marine acidity (pH) measured at agreed suite of representative sampling stations	III	IOC/UNESCO UNEP
14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics	14.4.1 Proportion of fish stocks within biologically sustainable levels	I	FAO

Tier classification for SDG14 Indicators

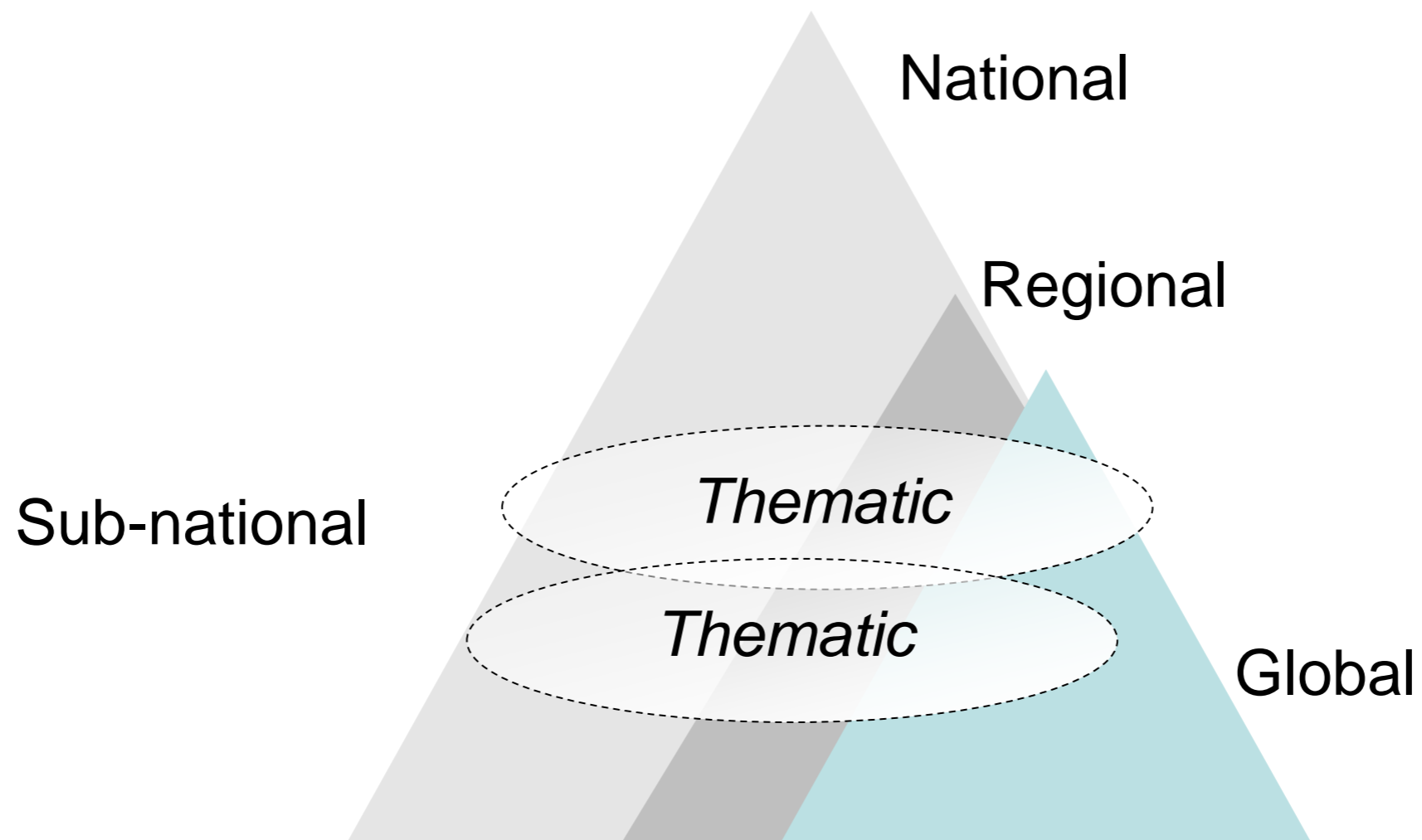
Target	Indicator	Tier	Lead agency
14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information	14.5.1 Coverage of protected areas in relation to marine areas	I	UNEP-WCMC UNEP
14.6 By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation[c]	14.6.1 Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing	III	FAO
14.7 By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism	14.7.1 Sustainable fisheries as a percentage of GDP in small island developing States, least developed countries and all countries	III	

Tier classification for SDG14 Indicators

Target	Indicator	Tier	Lead agency
14.a Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries	14.a.1 Proportion of total research budget allocated to research in the field of marine technology	III	IOC-UNESCO UNEP
14.b Provide access for small-scale artisanal fishers to marine resources and markets	14.b.1 Progress by countries in the degree of application of a legal/regulatory/policy/institutional framework which recognizes and protects access rights for small-scale fisheries	III	FAO
14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in the United Nations Convention on the Law of the Sea, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of “The future we want”	14.c.1 Number of countries making progress in ratifying, accepting and implementing through legal, policy and institutional frameworks, ocean-related instruments that implement international law, as reflected in the United Nations Convention on the Law of the Sea, for the conservation and sustainable use of the oceans and their resources	III	UN-DOALOS FAO UNEP ILO OTHER UN OCEAN AGENCIES



Multidimensional indicator framework architecture



Next steps for SDG indicator development (Tier 3)

Methodological workplans prepared by agencies (2017-2018)

(metadata, methodologies, how to report on existing data and produce new data)

- Technical expert groups
- Finalisation of draft methodology
- Testing in pilot countries
- Data validation by MS (National Statistical Systems)

Review of Tier 3 indicators by IAEG-SDG (2019-2020)

- Refinement vs Revision
- Adoption of indicator by the UN Statistical Commission
- Alignment of RS indicators with SDG global indicators
- Regular Reporting mechanism

*Capacity
development is
essential to achieve
the 2030 Agenda for
oceans and coasts*

14.1 by 2025, prevent and significantly **reduce marine pollution of all kinds**, particularly 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, to achieve healthy and productive oceans

14.3 **minimize and address the impacts of ocean acidification**, including through enhanced scientific cooperation at all levels

14.4 by 2020, effectively **regulate harvesting, and end overfishing, illegal, unreported and unregulated (IUU)** fishing and destructive fishing practices and implement science-based management plans, to restore fish stocks in the shortest time feasible at least to levels that can produce maximum sustainable yield as determined by their biological characteristics

14.5 by 2020, **conserve at least 10 per cent of coastal and marine areas**, consistent with national and international law and based on best available scientific information

14.6 by 2020, **prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing**, and eliminate subsidies that contribute to IUU fishing, and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the WTO fisheries subsidies negotiation*

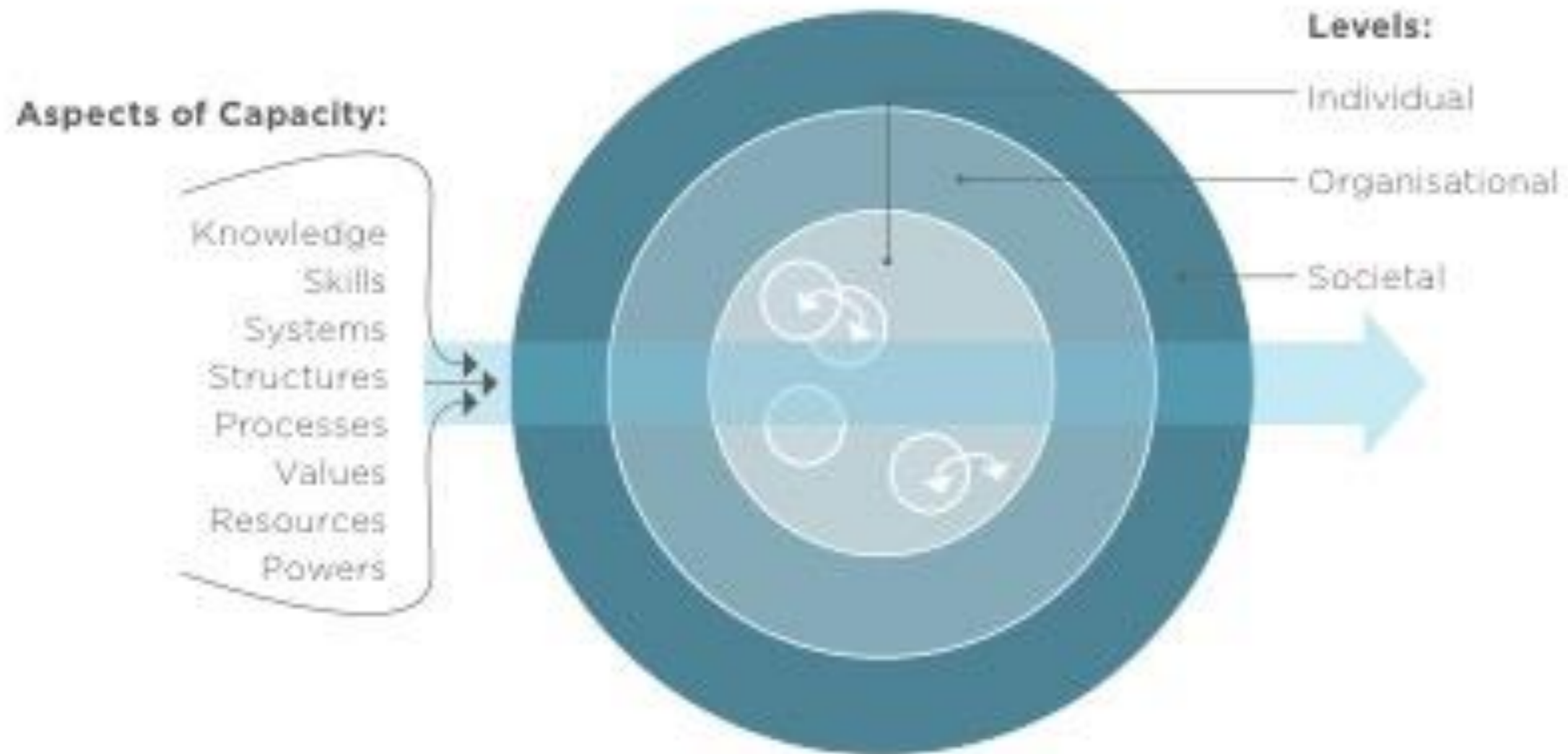
14.7 by 2030 **increase the economic benefits to SIDS and LDCs from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism**

14.a **increase scientific knowledge, develop research capacities and transfer marine technology taking into account the IOC-UNESCO Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity** to the development of developing countries, in particular SIDS and LDCs

14.b **provide access of small-scale artisanal fishers to marine resources and markets**

14.c ensure the full implementation of international law, as reflected in UNCLOS for states parties to it, including, where applicable, existing regional and international regimes for the **conservation and sustainable use of oceans and their resources by their parties**

What capacity development?



Source: IASS, 2016

SDG14 catalyst for transition to marine ecosystem-based policies and plans



IOC

Developing capacities in all regions

ICAM

1. Concepts, methodologies and best practices on Integrated Coastal area Management.
2. Methods and strategies for sustainable management.
3. Methodologies for evaluation of Coastal ecosystem goods and services.
4. Coastal physical characterization, impact assessment and natural risks (including climate change).
5. Approaches to coastal hazards mitigation
6. Ecosystem-based adaptation to address climate change impacts in the coast
6. Socio-economic analysis and coastal human impacts.
7. Elaboration of recommendations and actions plans for ICAM.

MSP

1. Concepts, policies, international experiences and best practices on marine spatial planning.
2. Techniques for Marine ecosystem goods and services valuation
3. Marine environmental characterization risks and impacts (including climate change).
4. Methodologies for marine socio-economic analysis and cumulative impacts.
5. Methodologies for step by step approach to the formulation of MSP plans
6. Methodologies for evaluation and monitoring of MSP

DATA

1. GIS Introduction, Data models, Data sources (Geoportals, SDI)
2. Spatial data component: Reference Coordinate System Management.
3. Spatial databases and thematic attributes modelling (Access / Postgress-PostGIS)
4. Data integration, analysis and representation (Licensed and open source software)
5. Creation of OGC interoperable services for web dissemination (Map server)
6. ODP and E-repositories

TOOLS

1. Data compilation and OGC services
2. Zoning and spatial conflict analysis
3. Digitalization of proposals, conversion to OGC services for web dissemination.
4. Personalization of web-viewers and atlases. (API/HTML5, Smart Atlas, etc.)
5. Web viewers development for dissemination and public participation: Licensed software architecture and "tiles": Google maps, Bin – OpenstreetMap Open source generalistic clients: (Html5)

ECOSYSTEM BASED-MANAGEMENT

DECISION SUPPORT TOOLS

Development and use of ecological, socio-economic and governance indicators to support coastal management/MSP processes
Methodologies for the conduct of integrated marine assessments
Coastal and marine protected areas' management and planning
Assessing coastal and marine biodiversity
Environmental economic analysis: Sectorial and integrated approach (Fisheries, Energy, Maritime Transportation, Tourism, etc.)
Financing incentives and co-funding initiatives
Coastal and Marine Governance, Legal framework coordination and improvement.
Stakeholder engagement, conflict resolution and negotiation skills in coastal management /MSP
Communication tools and strategies in the context of coastal and marine management and planning
Scenario development for planning and integrated management

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Oceanographic
Commission



Sustainable
Development
Goals

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

SKILLS

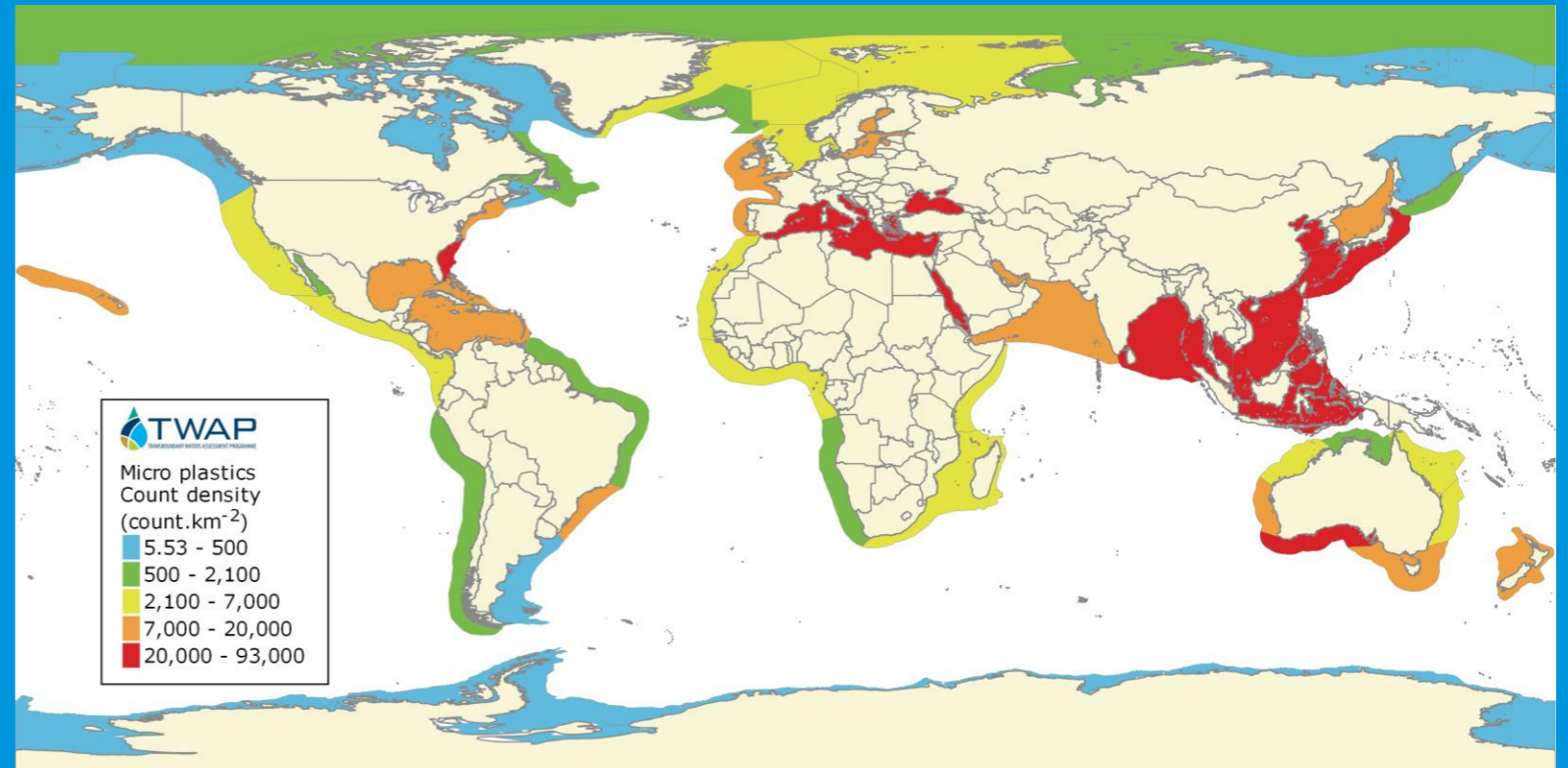


Coordination & implementation

- Priority settings and leadership
- Interinstitutional coordination
- Pollution reduction plans
- Stakeholders' engagement
- Mediation and conflict resolution
- Awareness campaigns and communication tools
- Strategies for sustainable actions and legal improvement.
- Reporting protocols

Technical and monitoring

- Monitoring system
- Standardisation of methods, sampling, monitoring
- Nutrient modelling techniques
- Tools and information systems
- Data reporting protocols



INDICATOR:

14.1.1 Index of coastal eutrophication and floating plastic debris density



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Intergovernmental
Oceanographic
Commission



Sustainable
Development
Goals

14.3 minimize and address the impacts of ocean acidification,

including through enhanced scientific cooperation at all levels

GLOBAL CARE
83% of the global
total ocean area,

SKILLS

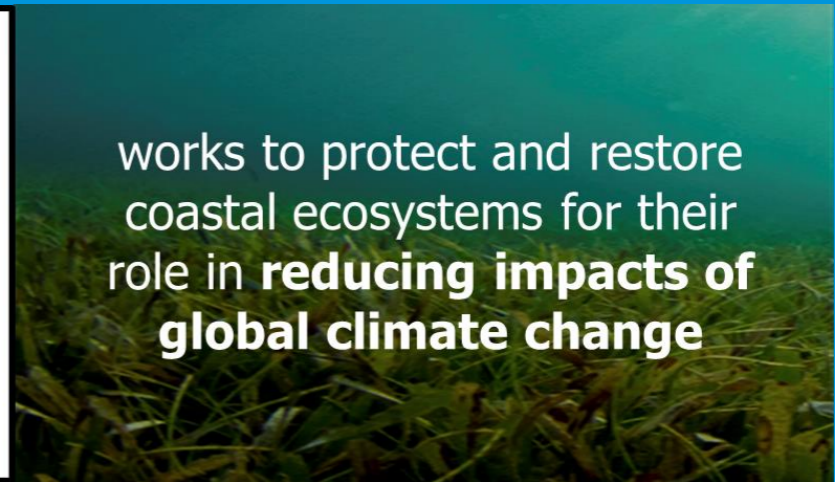


Coordination & implementation

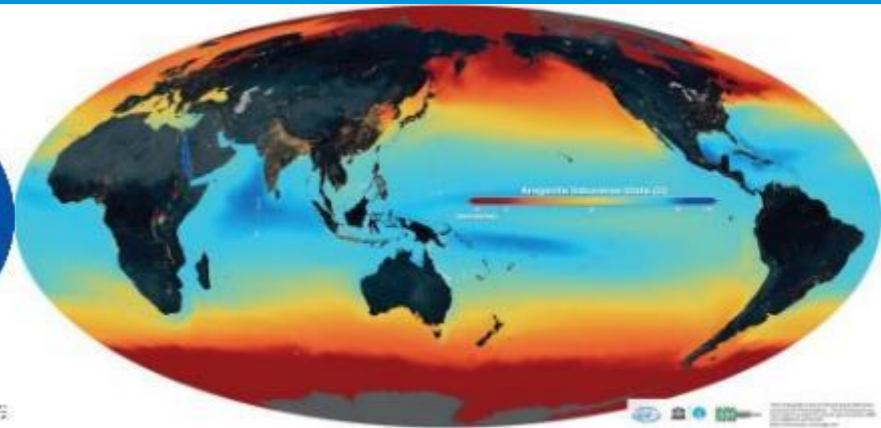
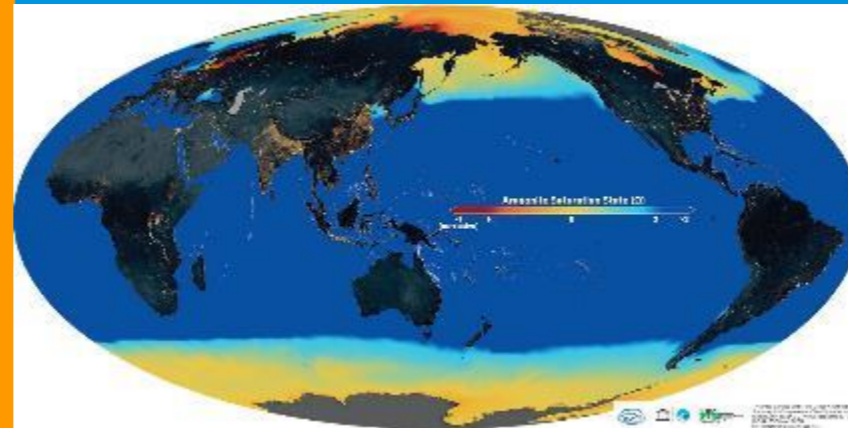
- Priority settings and leadership
- Forecasting and management
- Biological response approach
- Vulnerability assessments
- Effective communication
- Reporting protocols

Technical and monitoring

- Data and information integration, analysis and representation.
- Technology developments to help monitor and mitigate changes locally
- Modelling and scenario developments



Aragonite saturation in 1850 and 2100



INDICATOR:

14.3.1 Average marine acidity (pH) measured at agreed suite of representative sampling stations



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Oceanographic
Commission



Sustainable
Development
Goals

SKILLS



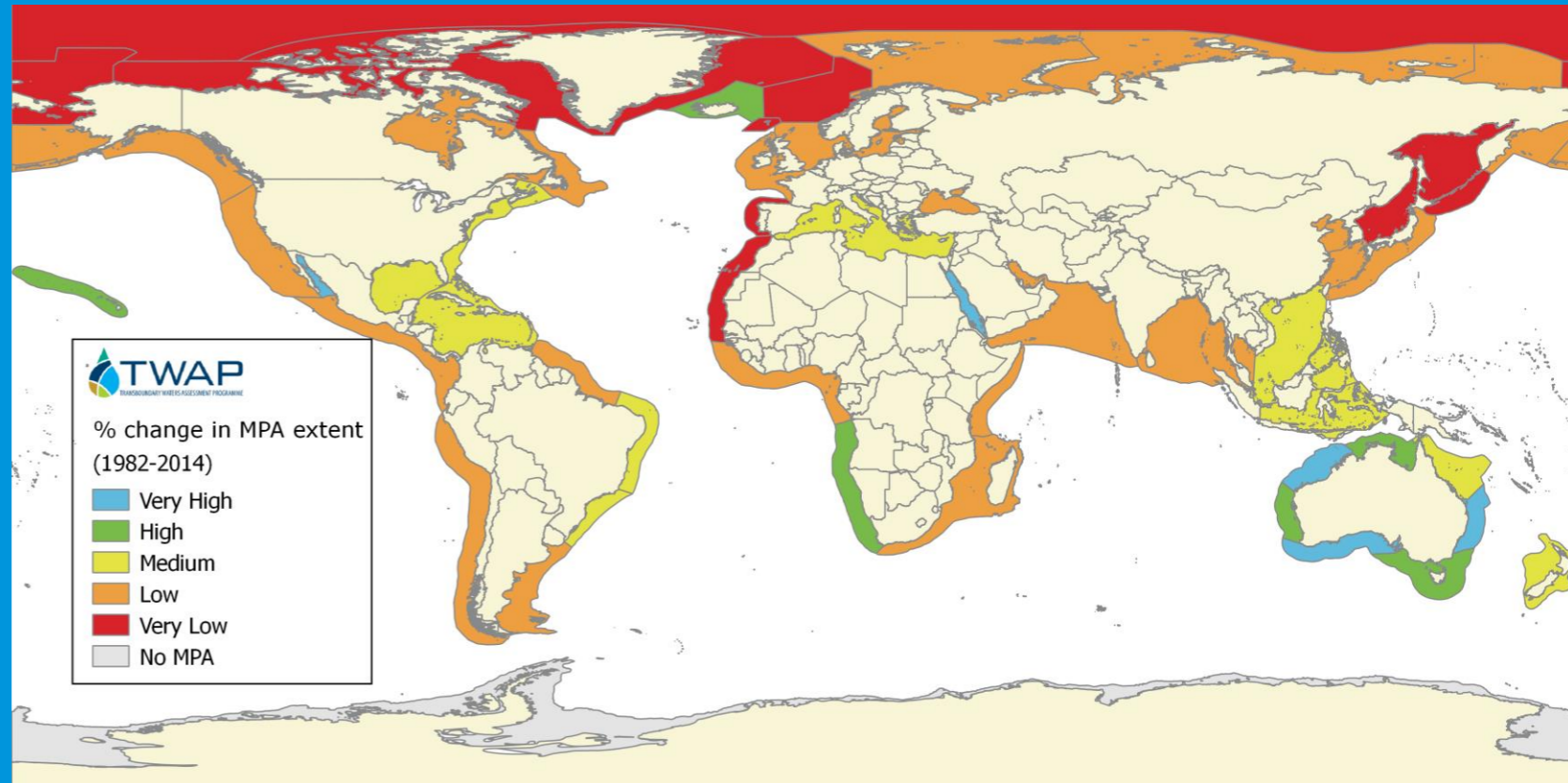
Coordination & implementation

- Priority settings and leadership
- Interinstitutional coordination
- Sustainable development strategies for local populations
- Effective protection and conservation measures
- Stakeholders' engagement and conflict resolution
- Effective communication strategies
- Implementation of reporting protocols

Technical and monitoring

- Data compilation and analysis
- Information development and dissemination
- Information to support public participation

14.5 by 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on best available scientific information



INDICATOR:
14.5.1 Coverage of protected areas in relation to marine areas



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Intergovernmental
Oceanographic
Commission



Sustainable
Development
Goals

SKILLS

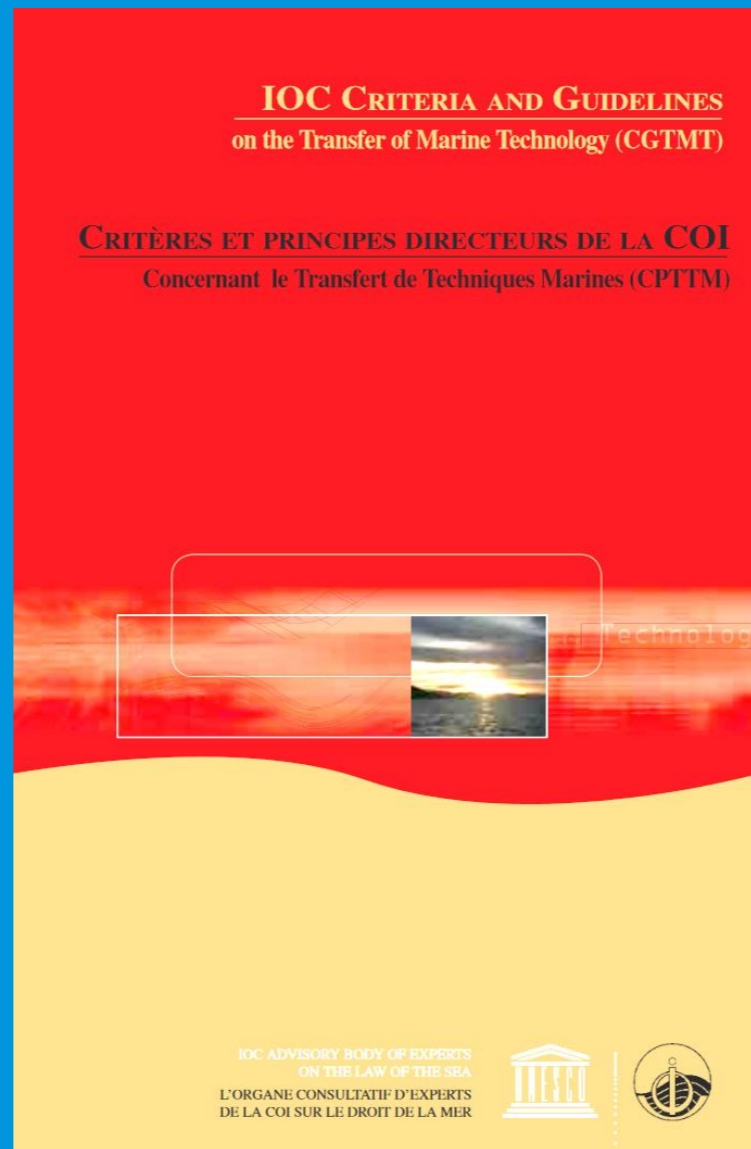
Integration of marine science/ technology in marine and coastal management

- Exploitation and exploration of marine resources
- Navigation safety
- Preservation of the marine environment
- Prevention of ocean-related hazards

Use of Marine technology:

- Information and data on marine sciences and related marine operations
- Manuals, guidelines, criterias, standards and reference materials
- Sampling and methodology equipment
- Observation facilities and equipment (including insitu and laboratorios)
- Knowledge sharing

14.a increase scientific knowledge, develop research capacities and transfer marine technology taking into account the IOC-UNESCO Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular SIDS and LDCs



Transfer of Marine Technology

INDICATOR:

14.a.1 Proportion of total research budget allocated to research in the field of marine technology

How do we know what is needed where?

Global Ocean Science Report



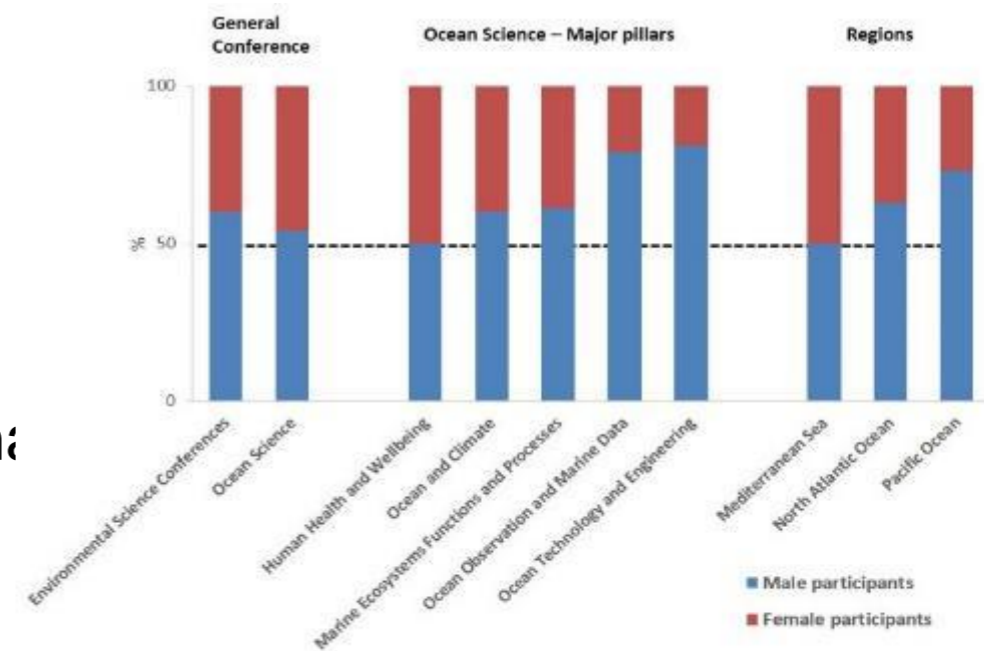
1st EB meeting May 2016, Helsingør, Denmark;
2nd EB meeting October 2016, Seoul, R of Korea.

Main objectives:

- Highlight patterns on how and where science is produced
- Organization of scientific collaboration
- Identify the opportunities & benefits of international collaboration
- Reporting mechanisms for SDG 14.a

Release of the first GOSR in 2017

(SDG 14 conference 5-9 June 2017, New York)



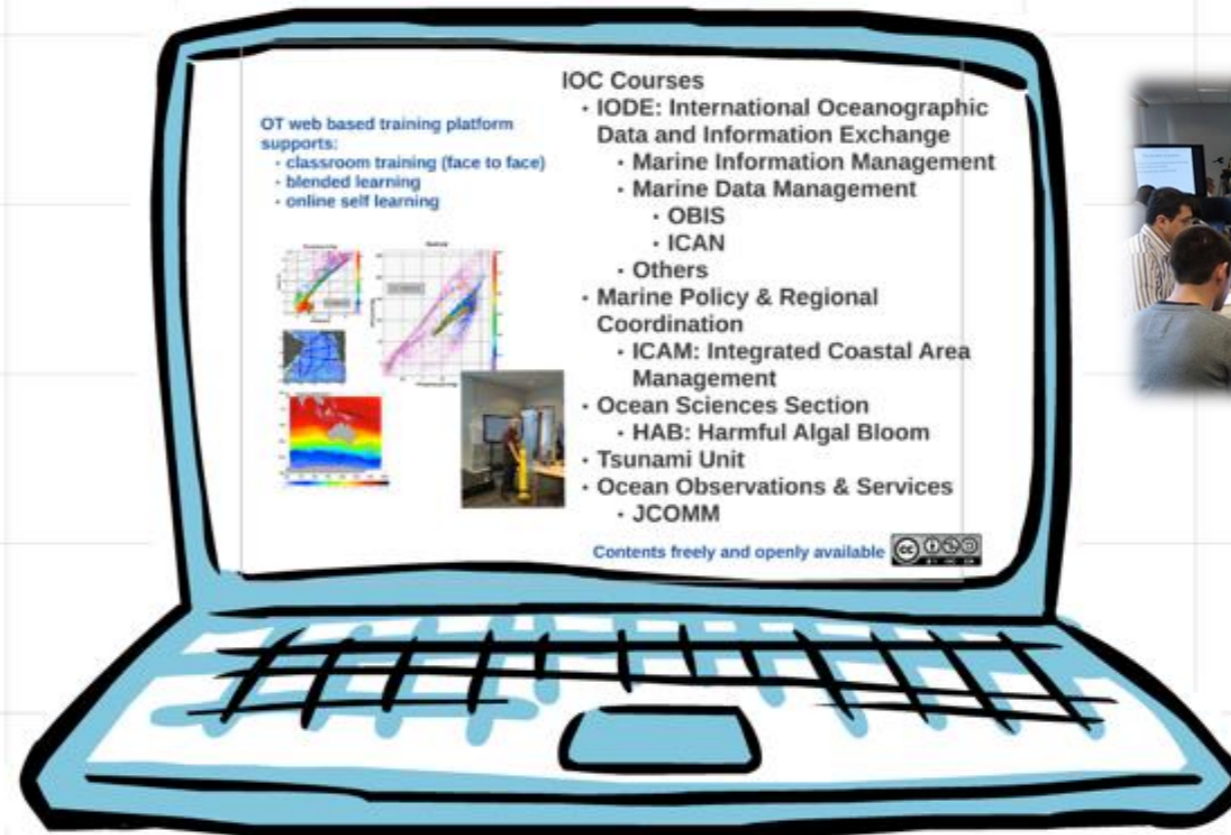
Relative proportion (%) of male and female experts attending international scientific conferences/symposia.

IOC CD Strategy (2015-2021)

Output	Activity
1. Human resources developed	1.1 Academic (higher) education
	1.2 Continuous professional development
	1.3 Sharing of knowledge and expertise/ community building
	1.4 Gender balance
2. Access to physical infrastructure established or improved	2.1 Facilitating access to infrastructure (facilities, instruments, vessels)
3. Global, regional and sub-regional mechanisms strengthened	3.1 Further strengthening and supporting secretariats of regional commissions
	3.2 Enhance effective communication between regional sub-commission secretariats and global programmes as well as other communities of practice (incl. other organisations)
4. Development of ocean research policies in support of sustainable development objectives promoted	4.1 Sharing of information on ocean research priorities
	4.2 Developing national marine science management procedures and national policies
5. Visibility and awareness increased	5.1 Public Information
	5.2 Ocean Literacy
6. Sustained (long-term) resource mobilization reinforced	6.1 In-kind opportunities
	6.2 Financial support by Member States to IOC activities

OceanTeacher: Learning platform

- OceanTeacher Global Academy (OTGA) (www.oceanteacher.org)
- (online) Learning Platform, supports training activities for several IOC Programmes



Web-based training system that supports:

- Classroom training (face-to-face)
- Blended training, online tutoring
- online self-learning
- Contents freely and openly available (but see Copyright)

*Videos:
keynote
lectures,
demos,
etc*



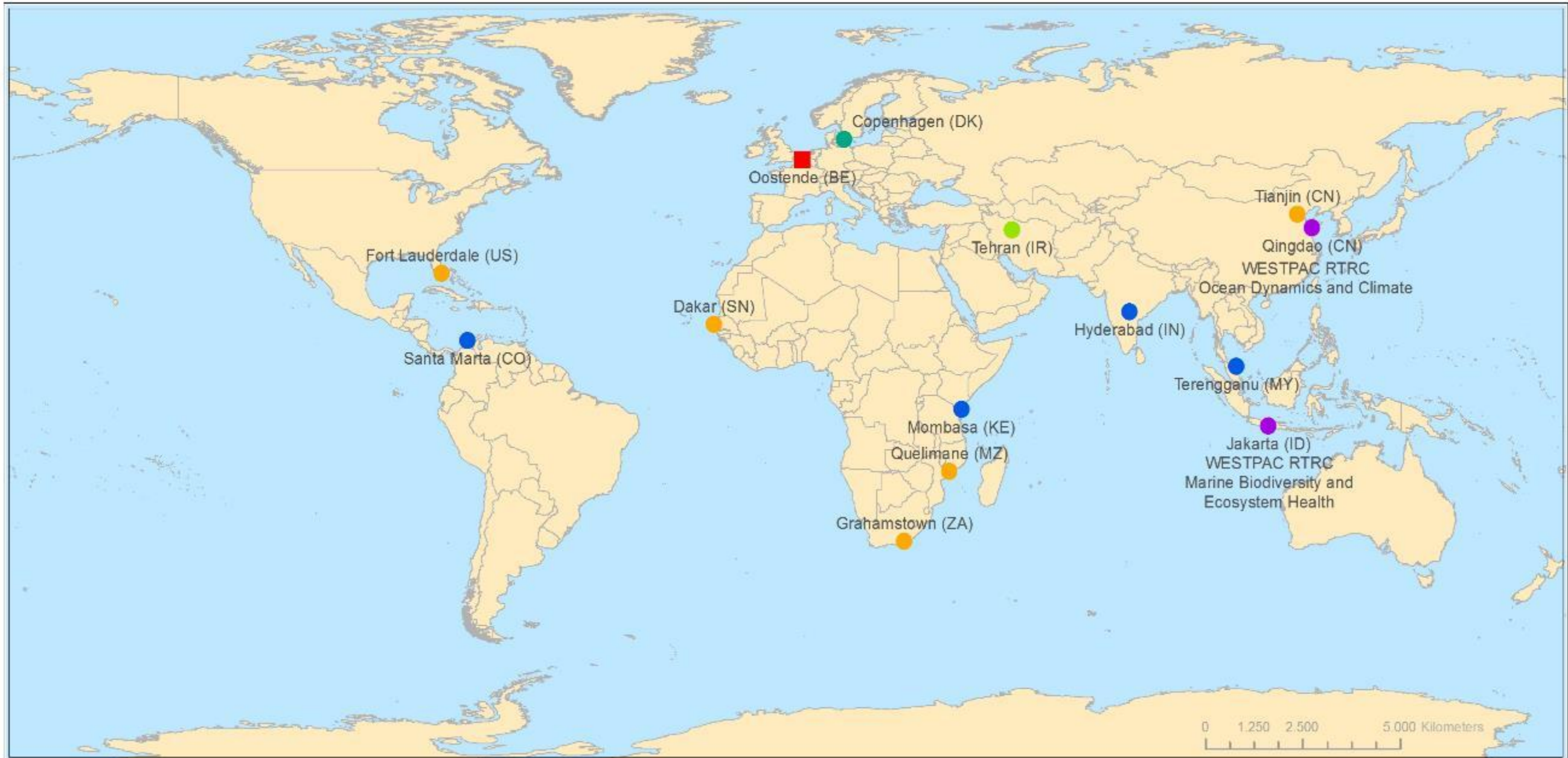
vimeo

*Courses Outlines,
Presentations,
miscellaneous
training
resources*



moodle

Intergovernmental Oceanographic Commission of UNESCO Capacity development - Regional Training and Research Centres



IOC-UNESCO/MPR, 2016

OceanTeacher Global Academy

- OceanTeacher Headquarters
- Designated OceanTeacher Regional Training Centres
- Candidate OceanTeacher Regional Training Centres

WESTPAC Regional Training and Research Centres

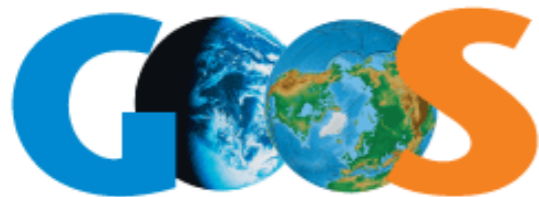
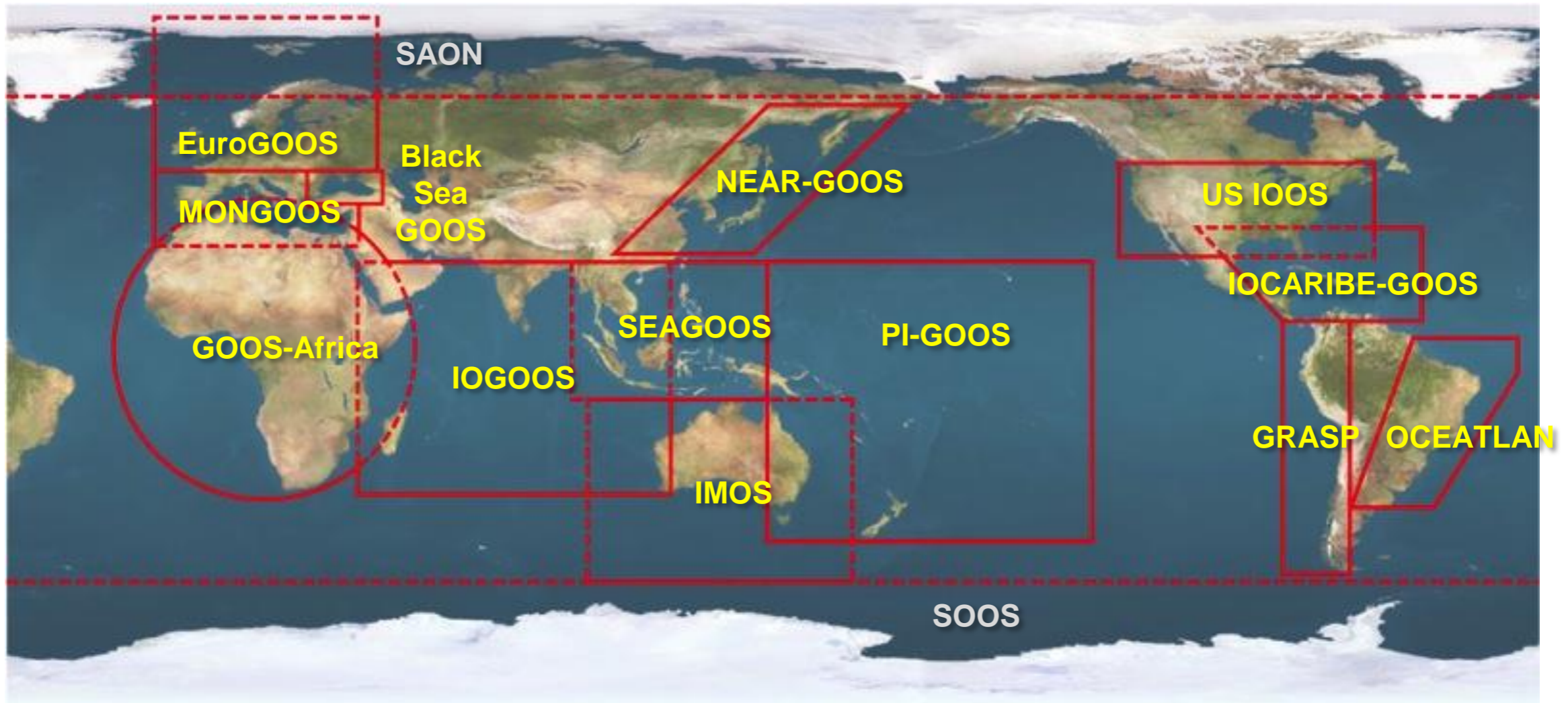
- WESTPAC RTRC

Other Regional Science and Communication Centres

- IOC Science and Communication Centre on Harmful Algae
- UNESCO II Category Centre: Regional Centre on Oceanography for Western Asia

SDG Indicators need to be supported by Sustained Ocean Observing System

Global approaches to regional action



The Global Ocean Observing System

UPDATE

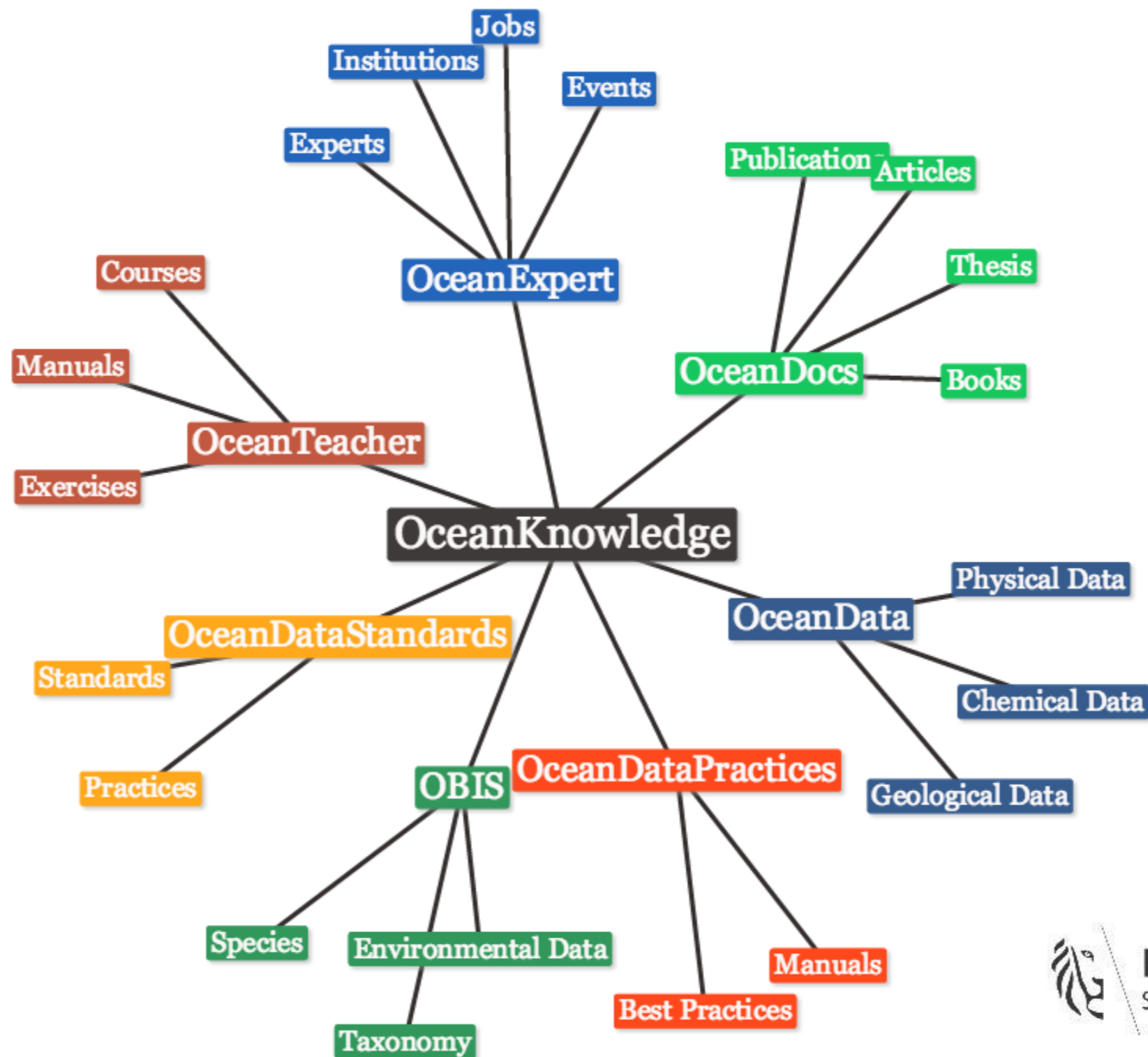
Outreach, sign up: ioc-goos.org/join

Twitter: @GOOSocean



IOC

Promoting Ocean knowledge





GEF LME:LEARN Partnership

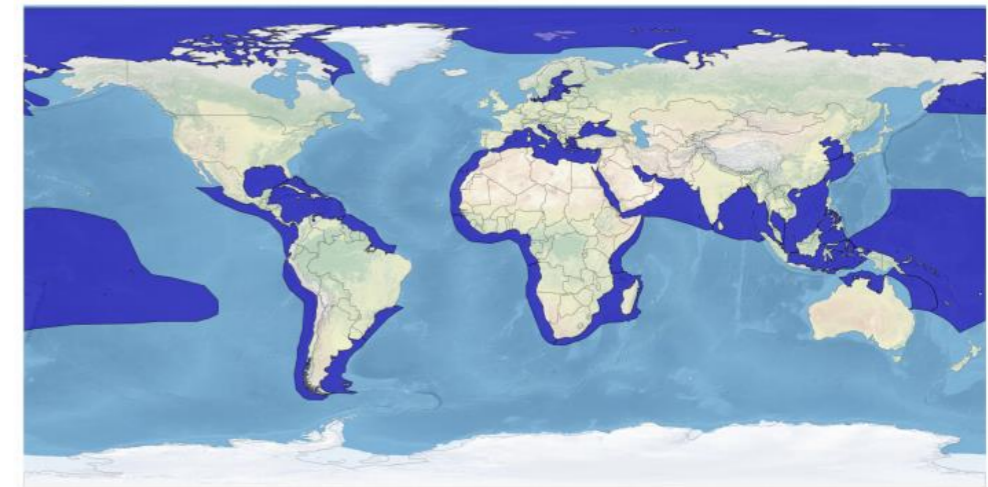


Strengthening Global Governance of Large Marine Ecosystems and Their Coasts through Enhanced Sharing and Application of LME/ICM/MPA Knowledge and Information Tools : LME:LEARN

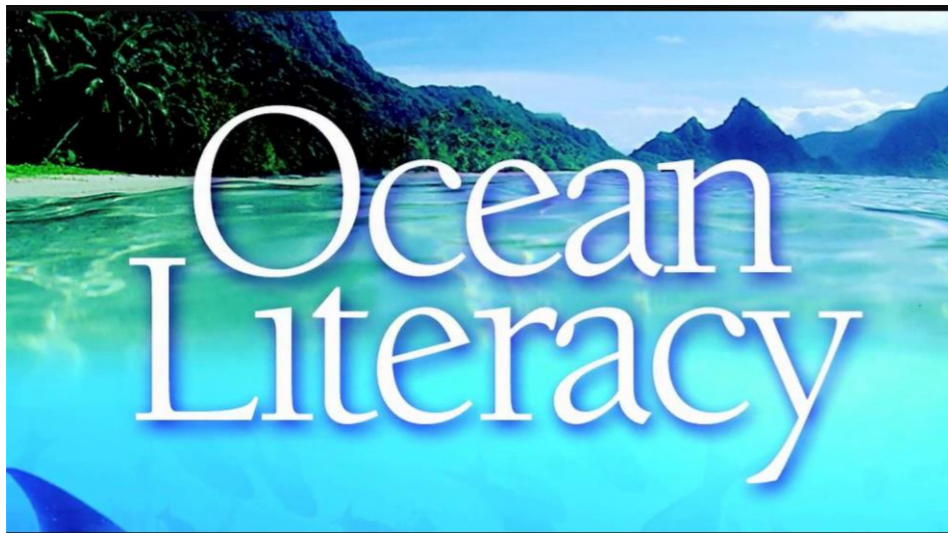


What are some key benefits?

- Guidance Toolkits and Training Modules on governance, environmental economics, stakeholder participation, LME assessment, marine spatial planning, data and information management, capacity development
- Global and Regional Training to enhance project capacity
- Support to Twinning Exchanges between Projects including a match-making web-portal



Let's not forget CD at societal level



An understanding of your influence on the ocean, and the ocean influence on you

An ocean literate person:

- Translate ocean knowledge into action;*
- is capable of communicating about the interdependencies between humans and the ocean in a meaningful way;*
- can make informed and responsible decisions.*

So in conclusions...

- All SDG 14 targets have a strong science and CD dimension (both monitoring & implementation)
- Regionally driven CD needs to build on regional needs assessment
- Interagency cooperation (global and regional) – SDG 14 Resource & Toolkit package?
- RS renewed cooperation with IOC Regions
- UN Conference on SDG14 – Towards a dedicated partnership on capacity development



IOC

Thank you!

Merci beaucoup!

¡Muchas gracias!

Спасибо

شُكْرًا

谢谢



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<http://unesco-ioc-marinesp.be>



Re-envisioning capacity development: **IOC strongly support regional ocean governance**

- **Place capacity development in the service of the transformation of the ocean governance** by achieving the goals of the Agenda 2030
- **Promote a new paradigm of capacity development** with a focus on donor coordination, effective development cooperation, long-term investment and regional ocean governance with bottom-up approach.
- **Apply capacity development and ocean governance across boundaries and contexts**, ecosystem-based management using regional seas and large marine ecosystems

- Global transboundary issues involving the open ocean already have and will have increasing impact locally
- Our ability to monitor human impacts on the open ocean is limited but growing
- Transboundary global and regional scale governance solutions are needed to mitigate even local damage to ocean ecosystems - enhancing governance around regional clusters that cover territorial areas and ABNJ may be a solution
- Scientific monitoring and assessment processes can and should insert themselves in policy cycles: monitoring SDG progress, improved UNGA World Ocean



Open ocean

Indicators and readiness to observe

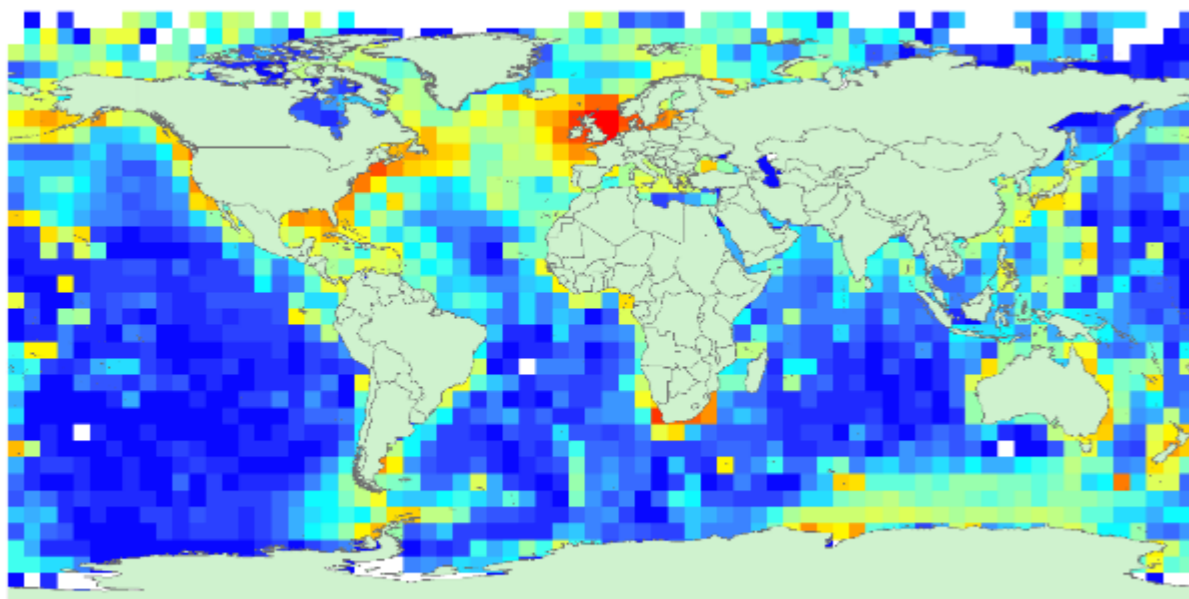
THEME	Expert Assessment	INDEX / INDICATOR (Baseline)	INDEX / INDICATOR (Projected to 2030, 2050, and/or 2100)	Sustained monitoring requirement for assessment includes both natural system and human data	Readiness of sustained observations (concept, pilot, mature, from least to most ready)
Governance	Existence of Open Ocean Governance Arrangements			Monitoring of governance arrangements covering ABNJ	concept
Climate	Climate and Ocean interactions	Ocean warming	Ocean warming	Physical / biogeochemical ocean variables	mature / pilot
		Deoxygenation	Deoxygenation (to 2090)	Oxygen	pilot
		Aragonite saturation state	Aragonite saturation state	Carbonate system	mature
			Sea Level Rise Risk Index (to 2100)	Sea level, temperature, cryosphere	mature / pilot
Ecosystems, habitats and biodiversity	Ocean Acidification Risk	Primary productivity		ocean colour in situ validation	mature pilot
		Phytoplankton		phytoplankton	concept
		Zooplankton		zooplankton	pilot
		Coral reefs (tropical ecosystem)	Coral reefs (tropical ecosystem)	coral health	pilot
		Pteropods (polar ecosystem)	Pteropods (polar ecosystem)	zooplankton	pilot
		Biodiversity (based on OBIS records)		Biodiversity (species records)	concept

THEME	Expert Assessment	INDEX / INDICATOR (Baseline)	INDEX / INDICATOR (Projected to 2030, 2050, and/or 2100)	Sustained monitoring requirement for assessment includes both natural system and human data	Readiness of sustained observations (concept, pilot, mature, from least to most ready)
Fisheries	Sustainability of fisheries	Marine Trophic Index	Fish Catch Potential	fish catch data by taxonomic group and trophic level	mature
		Fishing in Balance Index		fish catch data by taxonomic group and trophic level over time	mature
		Bottom Impacting Gear		method of fish catch	mature
		Demersal Fishing		method of fish catch	mature
		Tuna trends 1950 to 2010		fish catch data	mature
Pollution	Pollution (general)	Plastics		time series of ocean contaminants from strategically selected sites	concept

Data and information needs



>100 IODE DATA CENTRES
NODC + ADU (+OBIS)

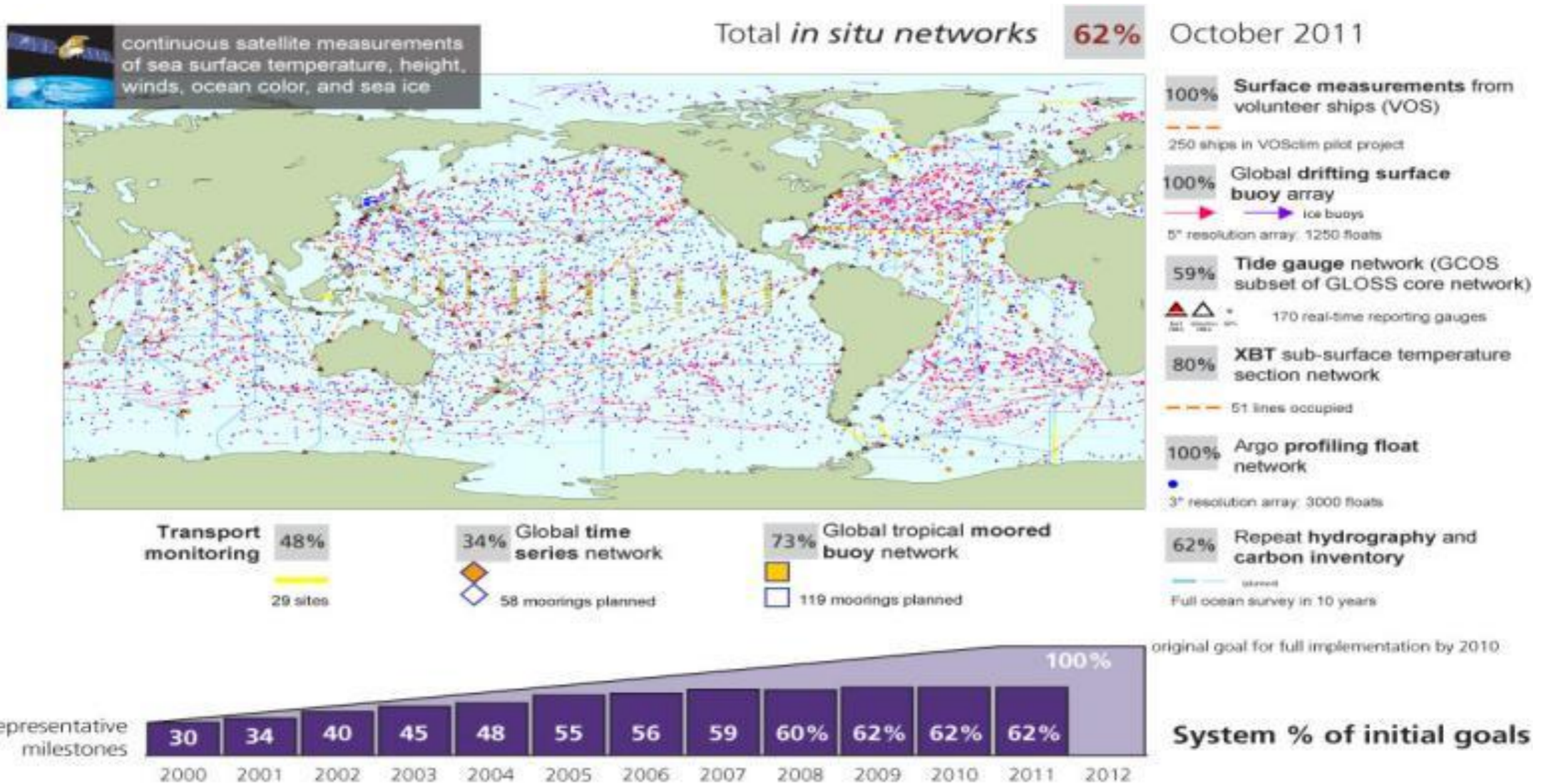


IODE VISION

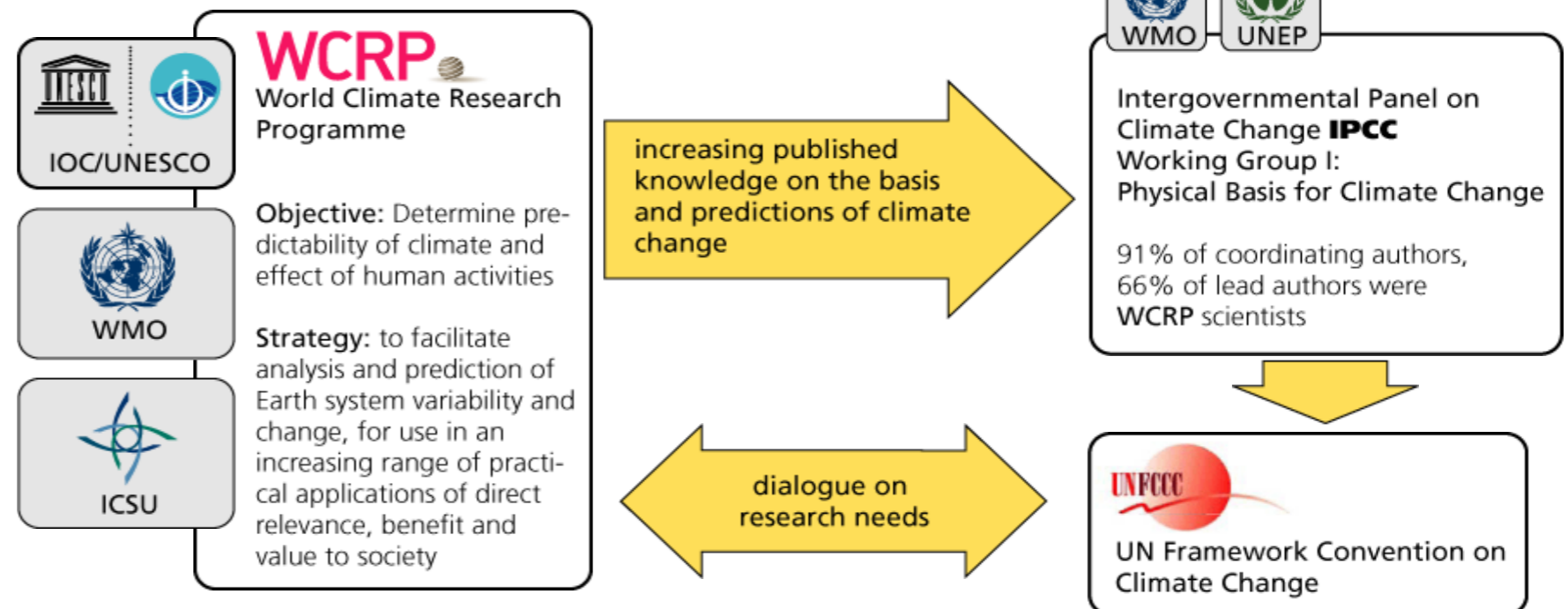
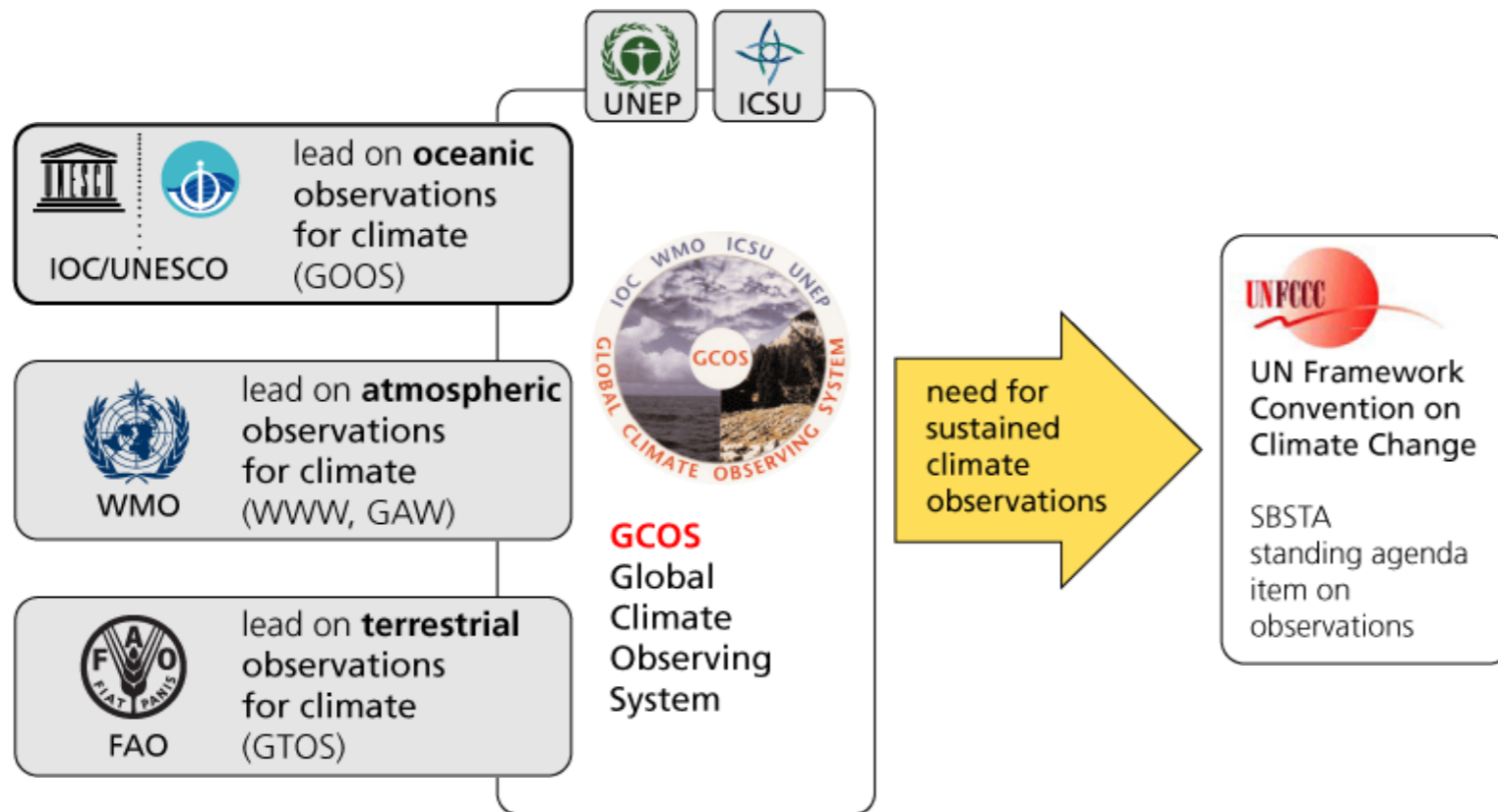
Established in 1961 to enhance marine research, exploitation and development, by facilitating the exchange of oceanographic data and information between participating Member States, and by meeting the needs of users for data and information products



GOOS: Global Ocean Observing System



Interaction with other policy processes: Climate Change



Developing and Sustaining the Ocean Observing System



CLIMATE



OPERATIONAL OCEAN SERVICES



OCEAN HEALTH



Expanding Essential Ocean Variables

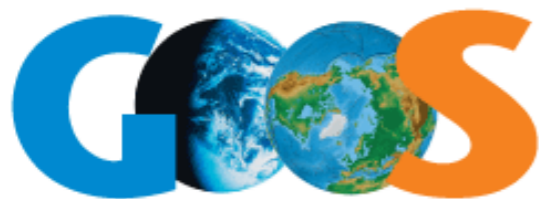
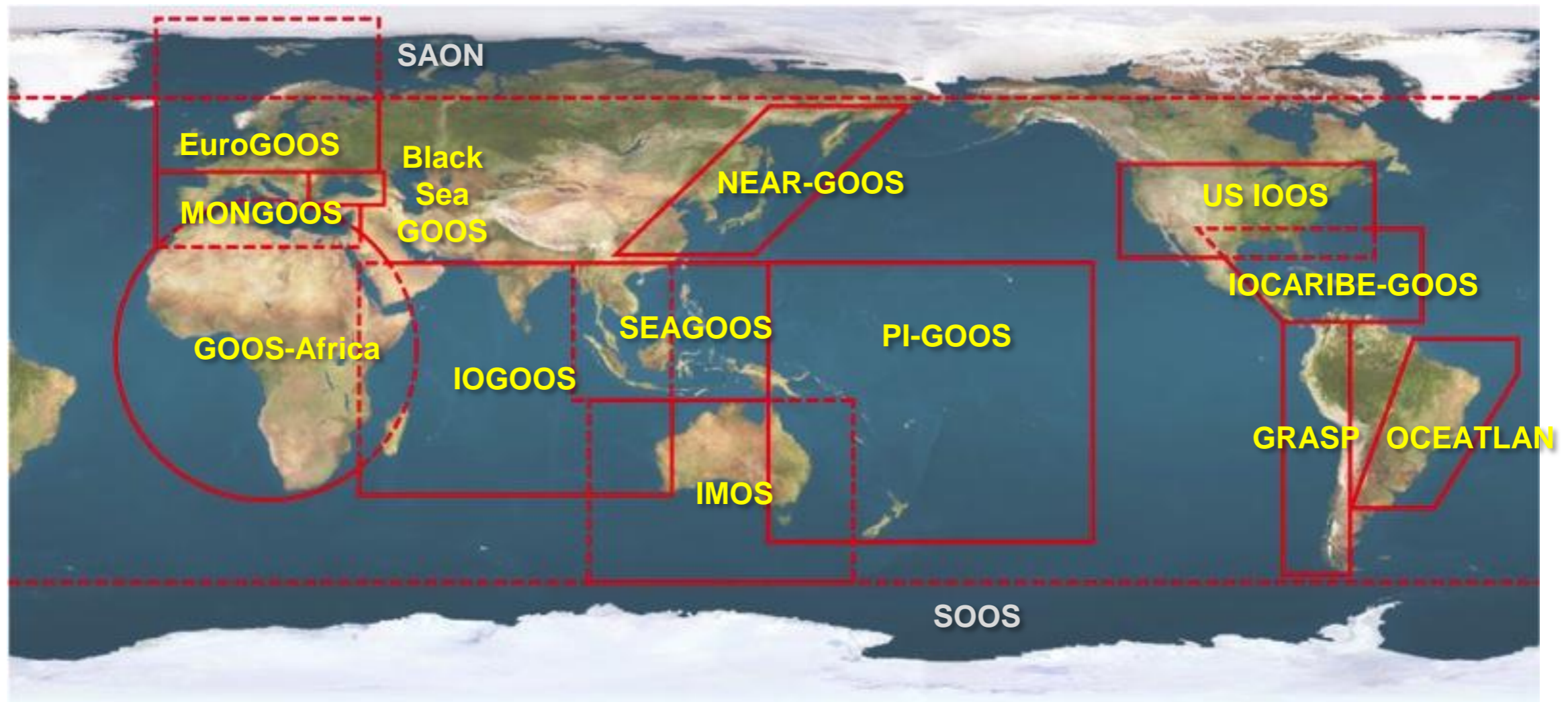
CONCEPT -> **PILOT** -> **MATURE**



IOC

Developing and Sustaining the Ocean Observing System

Global approaches to regional action



The Global Ocean Observing System

UPDATE

Outreach, sign up: ioc-goos.org/join

Twitter: @GOOSocean



IOC

Products, guidelines, standards and methods



OceanExpert
Directory of Marine & Freshwater Professionals



EBM

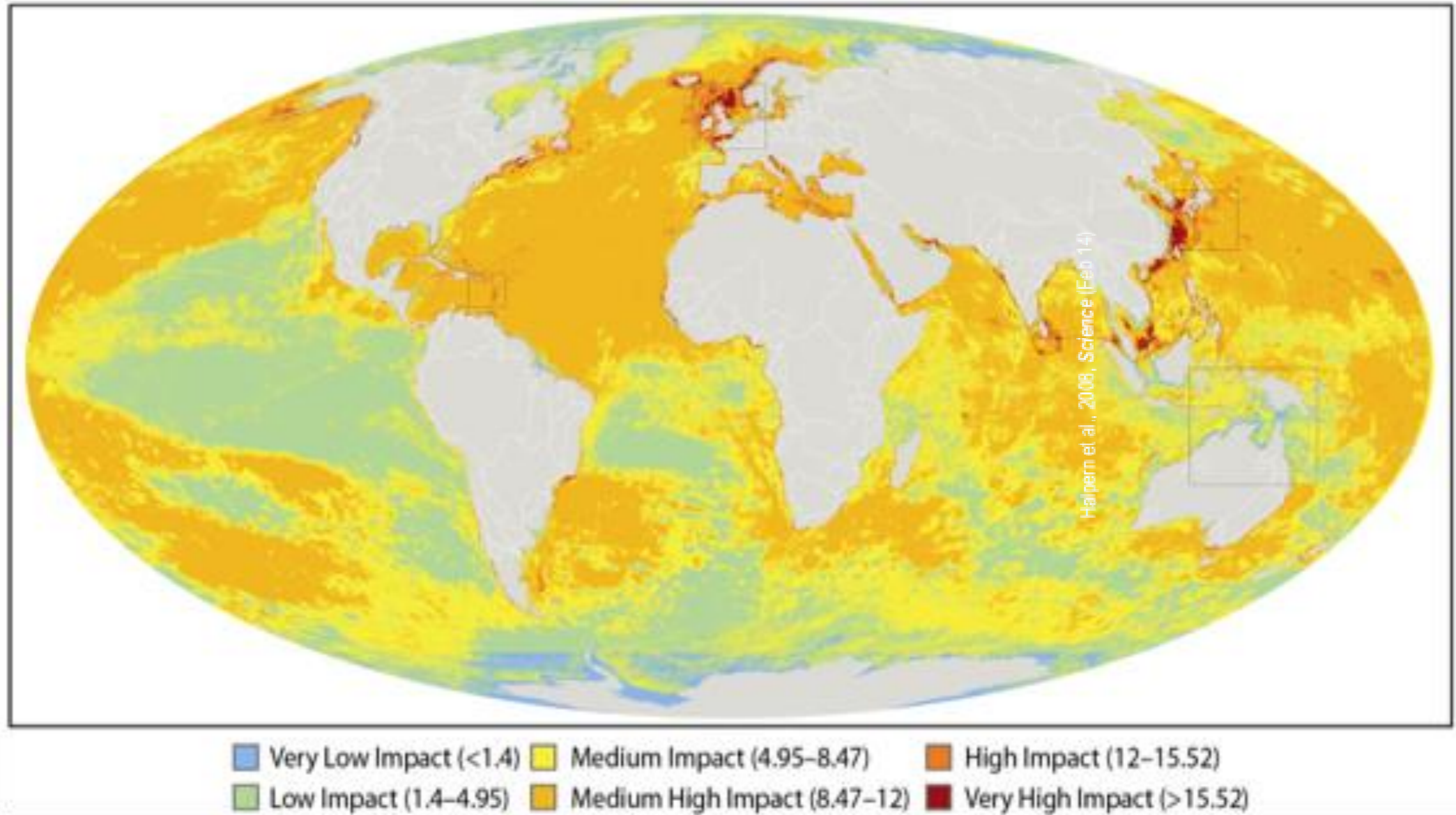
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IOC

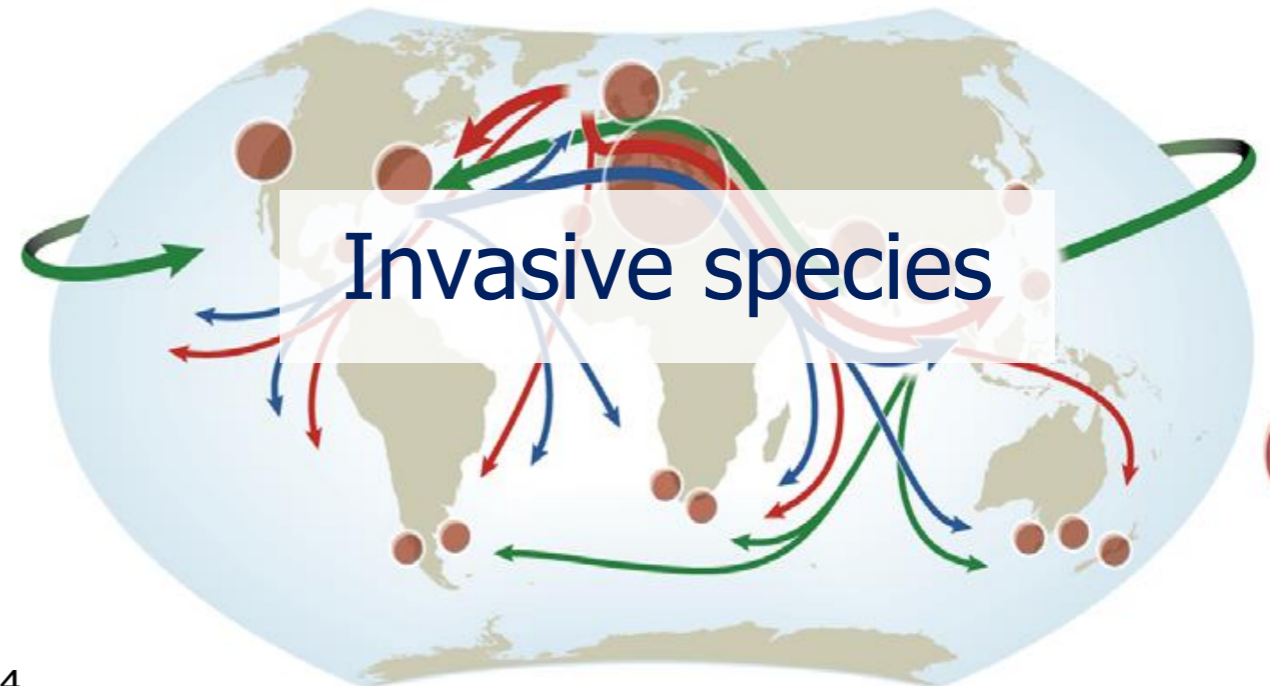
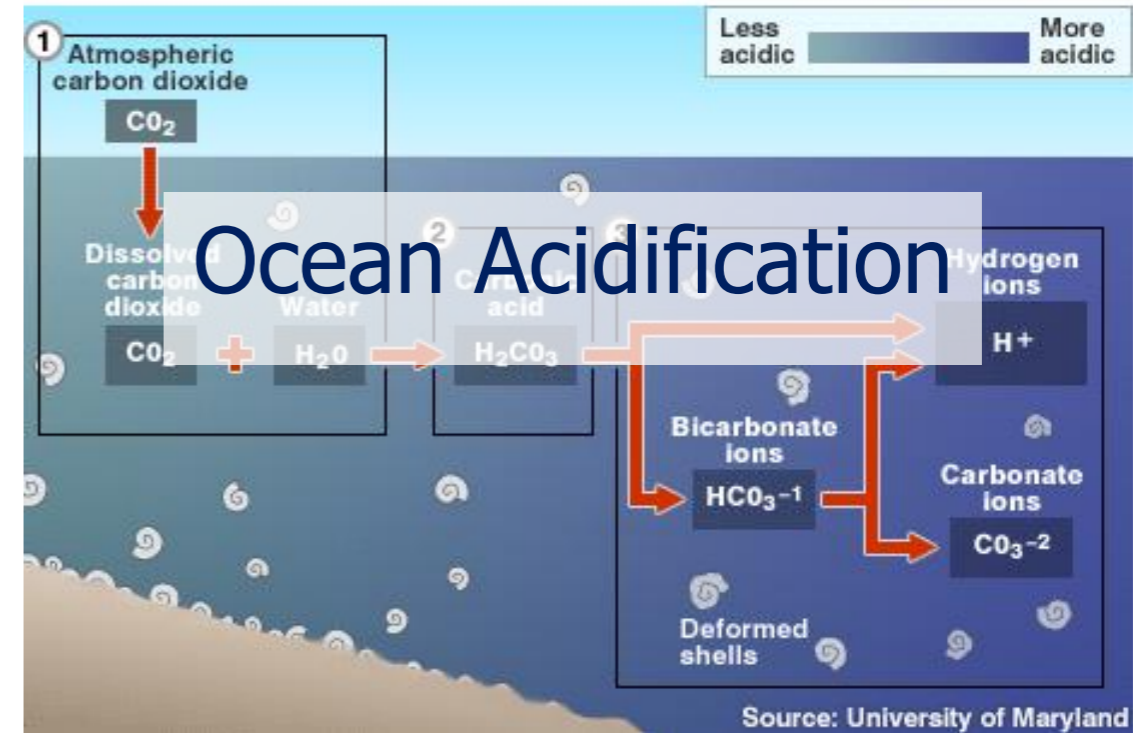
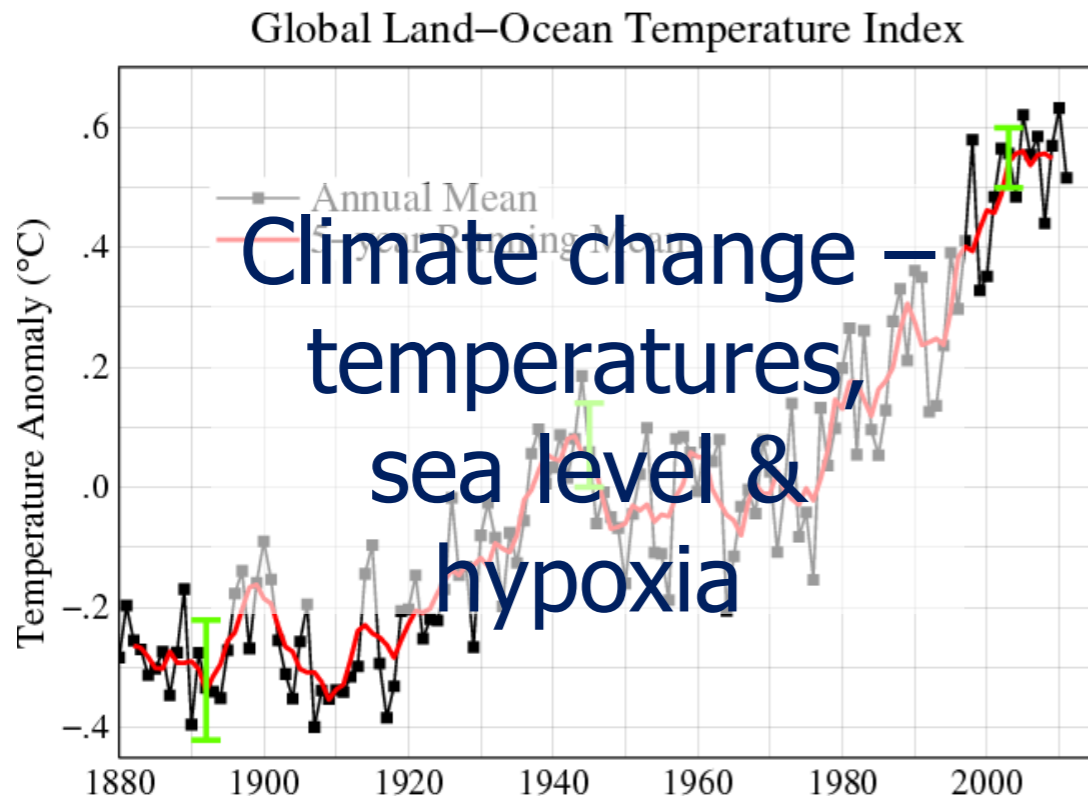
No area of the Ocean is untouched by human activity...

Source: Halpern, Benjamin, 2008. Science. 14 February

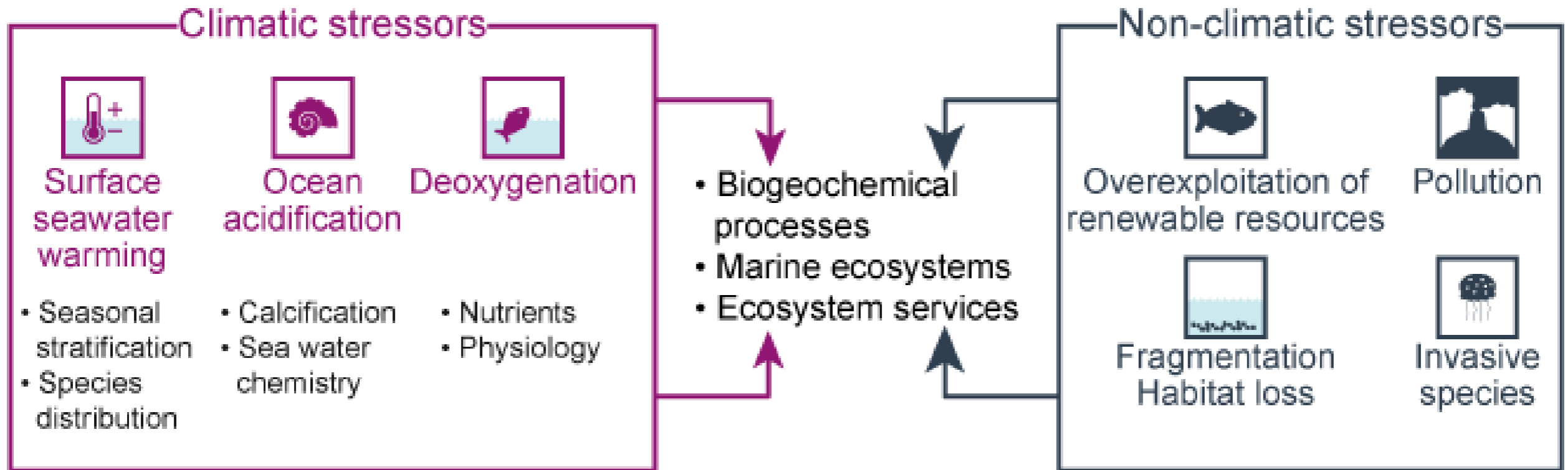


And many marine areas are under increasing development pressures....

Single stressors



Multiple stressors



Possible effects of combining different stressors:

Amplification

Compensation

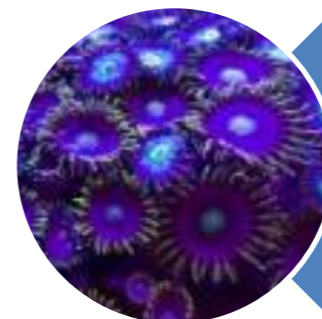
The ocean is priceless



Marine Fishery
and Aquaculture



Marine Tourism



Biotechnology and
bioproducts



Marine Mining



Marine Construction
and Marine Equipment
manufacturing



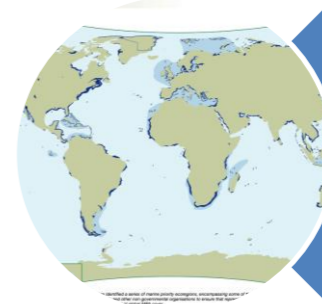
Desalination



Offshore oil and
gas



Marine research and
development ,ocean
literacy



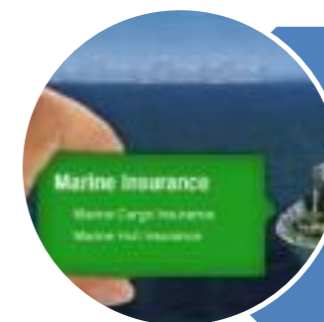
Marine
administration



Ports and
shipping
industry



Renewable
energy



Marine business
services

REGIONAL APPROACH OF IOC

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Marine Policy and Regional Coordination Section



Coordination of IOC's external policy/science, communication and multi-agency partnership



Development and dissemination of Coastal and Marine Management Tools (ICAM, MSP, LME)



Regional coordination

OceanTeacher Global Academy: Regional Training Centres



Headquarters:



Ostend, Belgium

Africa:



Senegal (French)



South Africa (English)



Mozambique (Portuguese)



Kenya (English)

América/Caribbean:



Colombia (Spanish)



USA (English)

Asia:



China (Chinese, English)



India (Hindi, English)



Malaysia (Malaysian, English)



Samoa (English)

Other centres

WESTPAC Training and Research

Centres:



**Ocean Dynamics and Climate
Qingdao (China)**

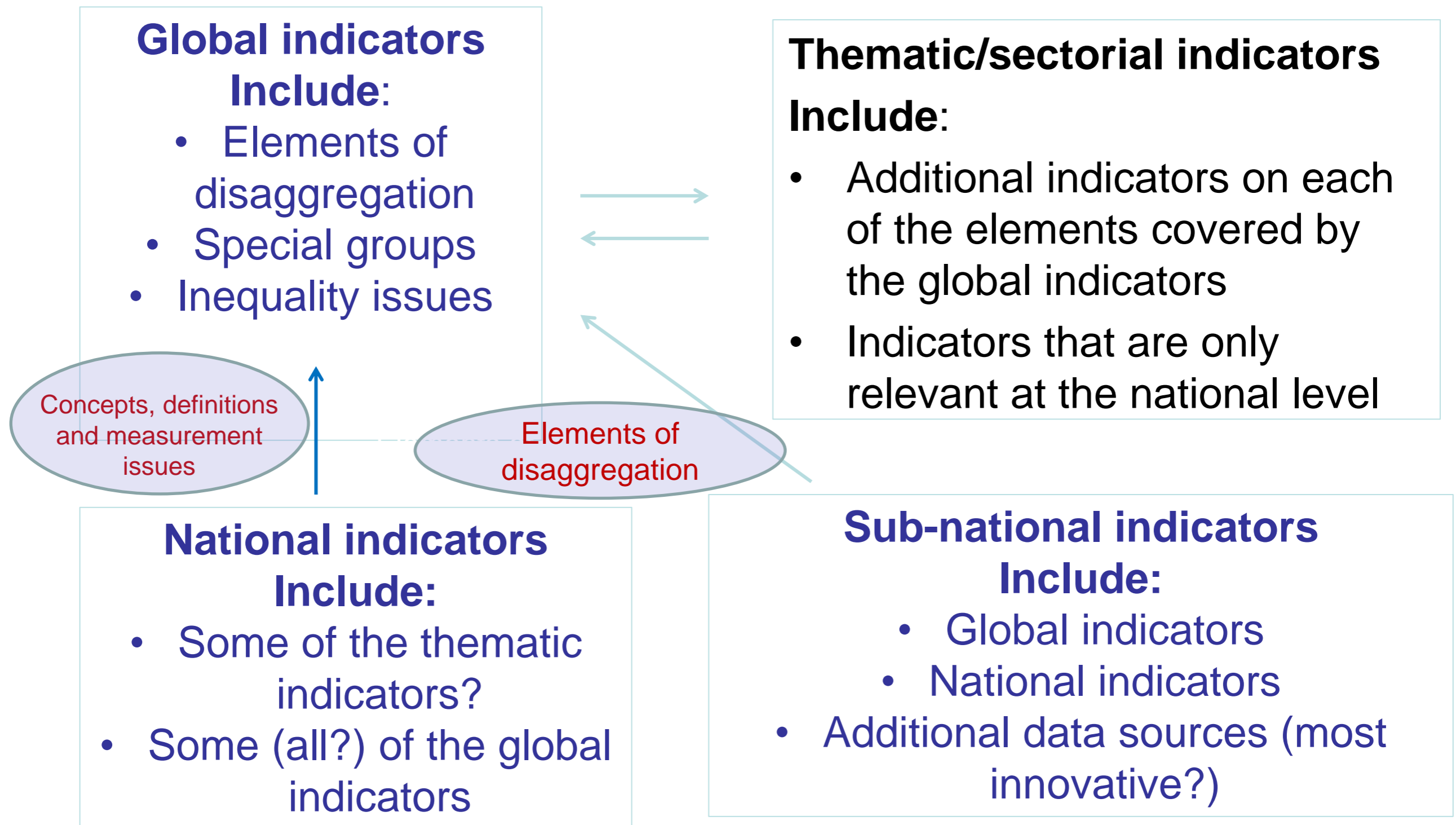


**Marine biodiversity and Ecos
Jakarta (Indonesia)**



**Category 2 – UNESCO Regional
Educational and Research Centre on
Oceanography for Western Asia / Islamic
Republic of Iran.**

A “framework” of indicators?



Public managers need to provide more



