



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

Marine Science in a Global Context and the Second International Indian Ocean Expedition

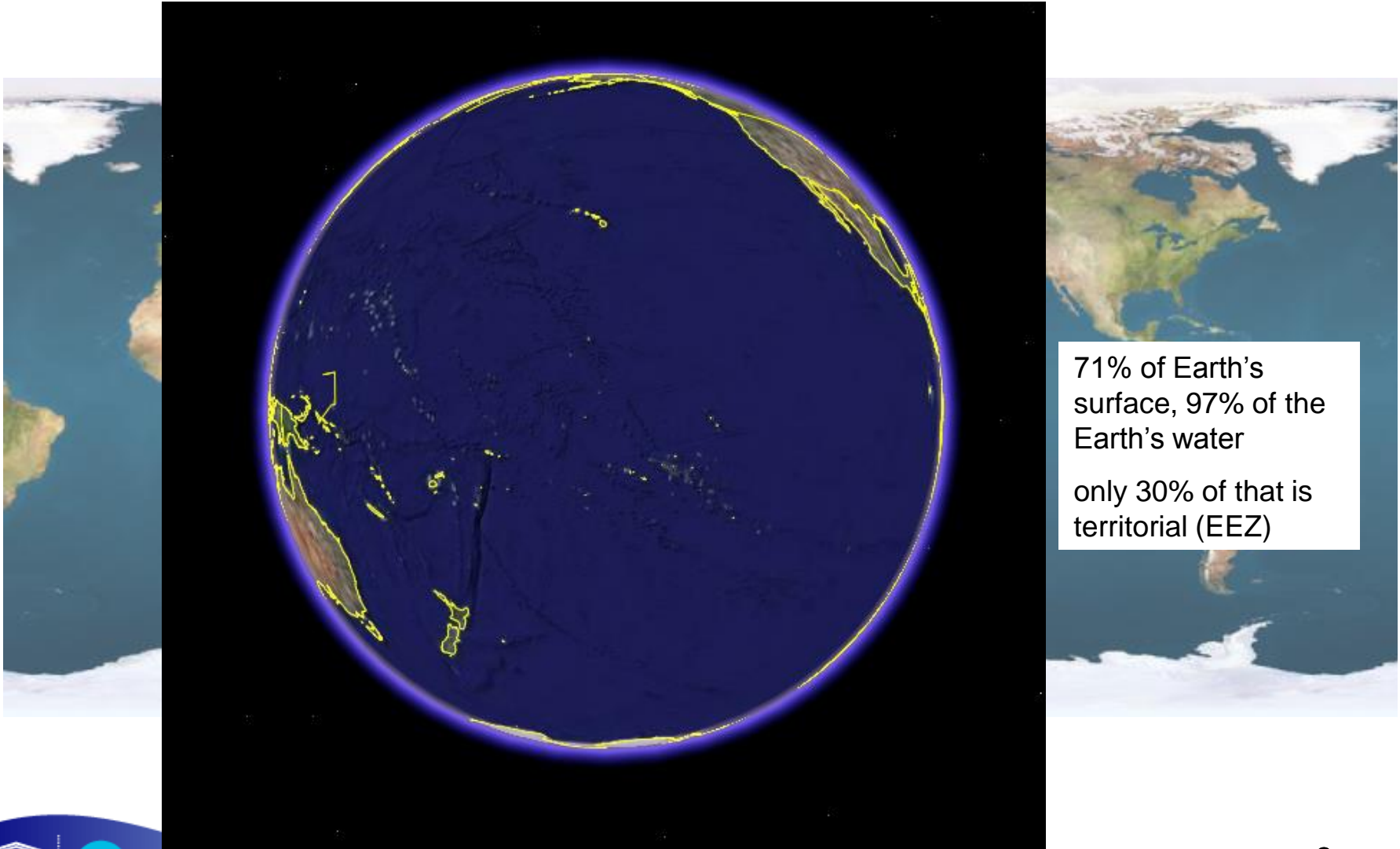
Mika Odido

IOC Sub-Commission for Africa and the Adjacent Island States.

International workshop on Sustainable Use of Coastal and Marine Resources in Kenya

27 – 29 October 2014, Mombasa, Kenya.

The oceans are a global commons



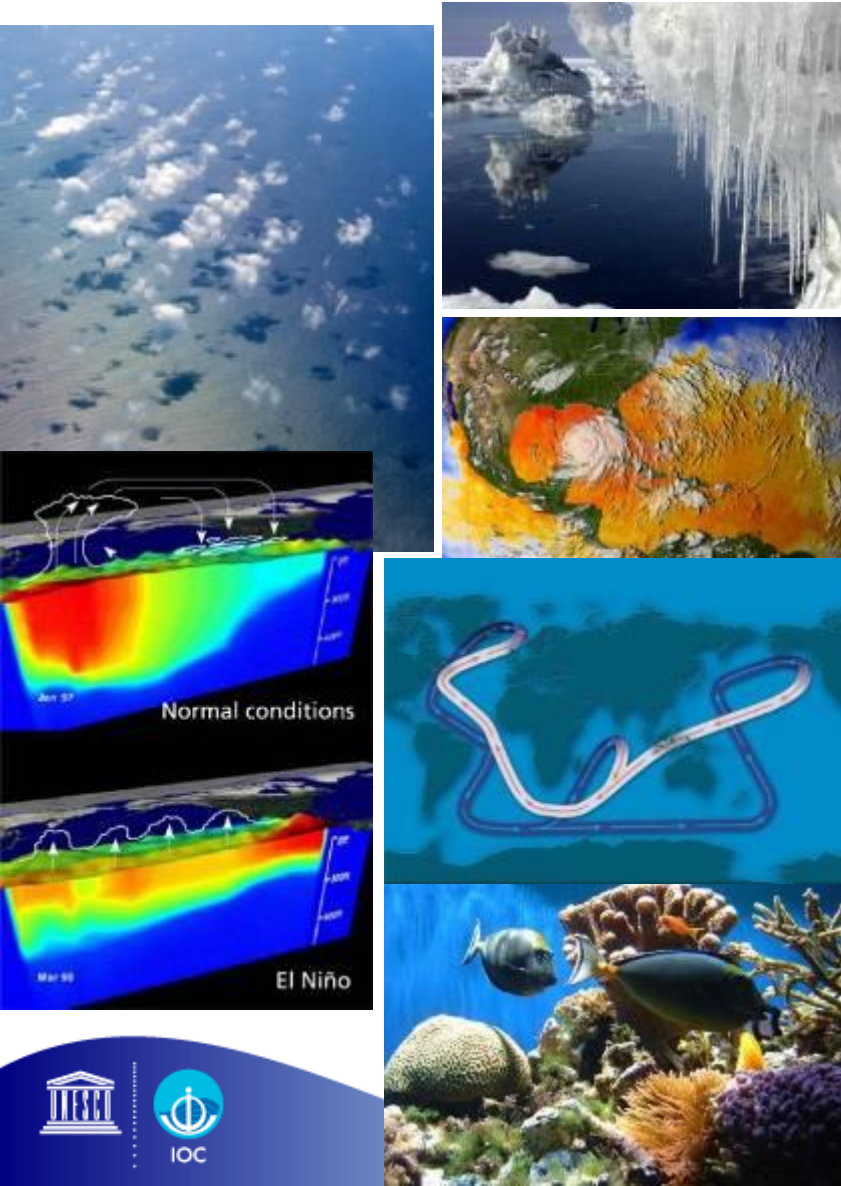
71% of Earth's surface, 97% of the Earth's water
only 30% of that is territorial (EEZ)

Oceans are an economic and cultural resource



- Value of marine activities globally is ~5% of global GDP, US\$ 2.7 trillion
- 90% of all goods shipped by sea
- Weather prediction and climate projections depend on ocean information
- More than ½ of human population lives in the coastal zone (within 100 km of coast)- by 2025 this is projected to reach 75%
- Fisheries provide 1 billion people with main source of animal protein
- 49 World Heritage sites inscribed for their coastal or marine values
- We are still exploring the richness of oceans: 2000-2010 Census of Marine Life discovered many unknown species³

Oceans affect us all through climate variability and change



- Oceans are the ‘memory’ of the climate system.
- Populations vulnerable to sea level rise are concentrated in coastal river delta cities, and Small Island Developing States
- Oceans have absorbed 50% of human emissions of CO₂, but rate of absorption is slowing
- CO₂ is making oceans more acid with consequences on marine ecosystems like coral reefs

Total GDP potential of South Africa's oceans in 2033 is R129 to R177 billion and creation of 800 000 to 1 million jobs

 Sectorial deep dives

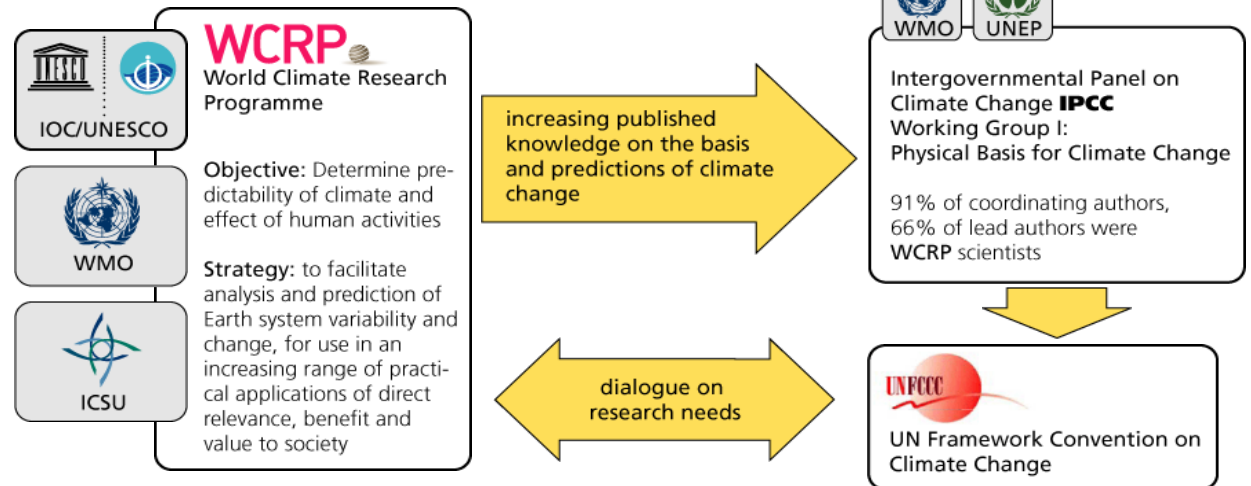
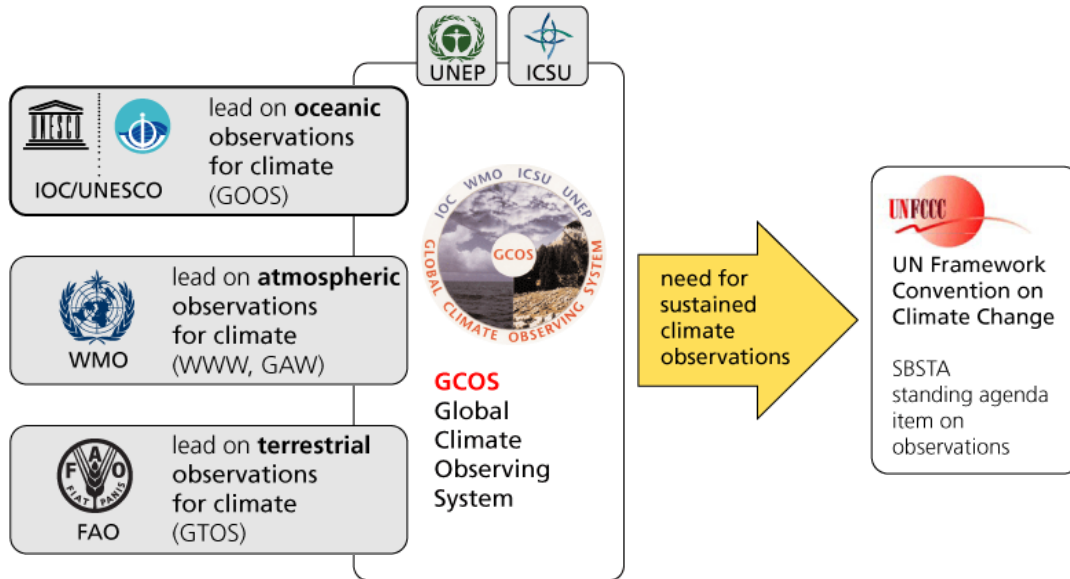
	GDP, R bn			Jobs, 000	
	2010	2033	CAGR, %	2010	2033
Marine transport and manufacturing	16	42-61	6%	15	40-56
Tourism	15	25-35	4%	90	150-225
Offshore oil and gas	4	11-17		0.4	0.8-1.2
Construction	8	20-21	4%	162	390-407
Renewable energy	0	14-17	25%	-	0.9-1.1
Fisheries and aquaculture	7	10-16	4%	30	170-250
Communication	4	7-10	4%	19	35-52
Desalination	0	0.1-0.1	1%	0	1.6-1.6
Marine protection services	-	TBD		-	TBD
Total	54	129-177		316	788-1,004

Establishment of IOC

- Promote **international cooperation and coordinate programmes** in research, services and capacity building, in order to learn more about the nature and resources of the ocean and coastal areas; and to **apply that knowledge for the improvement** of management, sustainable development, the protection of the marine environment, and the decision-making processes of its Member States
- Within UNESCO, IOC enjoys a special status of functional autonomy
- Focal point in UN for ocean observations, ocean science, ocean services and data exchange



IOC within UN: climate



Elements of IOC's Medium Term Strategy

Promoting knowledge and capacity for protecting and sustainably managing the ocean and coasts”

3 Expected Results:

1. Scientific understanding of ocean and coastal processes bolstered and used by Member States to improve the management of the human relationship with the ocean
2. Risks and impacts of ocean-related hazards reduced, climate change adaptation and mitigation measures taken, and policies for healthy ocean ecosystems developed and implemented by Member States
3. Member States' institutional capacities reinforced to protect and sustainably manage ocean and coastal resources

IOCAFRICA Regional Expected Results.

- Increased understanding of ocean and coastal processes around Africa, and how they impact on environment and resources
- Increased technical capacity for monitoring and early warning for coastal and oceanic natural hazards
- Improved understanding of how African Oceans and Coastal areas will be impacted by changing climates
- Enhanced preparation by member states and coastal communities to and mitigate the impacts of coastal hazards and climate change.
- Marine and oceanographic training and research institutions strengthened
- Creation of critical mass of marine science professionals, to identify and address key issues relevant to Africa



Future we Want

‘..... Rio+20 outcomes had 20 Articles (158-177) on Oceans and Seas’

- Protecting people and improving the health of the ocean
- Protecting, recovering and sustaining the ocean’s environment and natural resources and restoring full food production and livelihood services
- Strengthening ocean knowledge and the management of the ocean



Sustainable Development Goals (post 2015)

Proposed goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

- 14.a increase scientific knowledge, develop research capacities and transfer marine technology
- 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

Proposed SDG 14 targets.

- 14.1 by 2025, prevent and significantly reduce marine pollution of all kinds
- 14.2 by 2020, sustainably manage, and protect marine and coastal ecosystems to avoid significant adverse impacts
- 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
- 14.5 by 2020, conserve at least 10 per cent of coastal and marine areas
- 14.6 by 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, and eliminate subsidies that contribute to IUU fishing
- 14.7 by 2030 increase the economic benefits to SIDS and LDCs from the sustainable use of marine resources

THE INTERNATIONAL INDIAN OCEAN EXPEDITION 1959-64

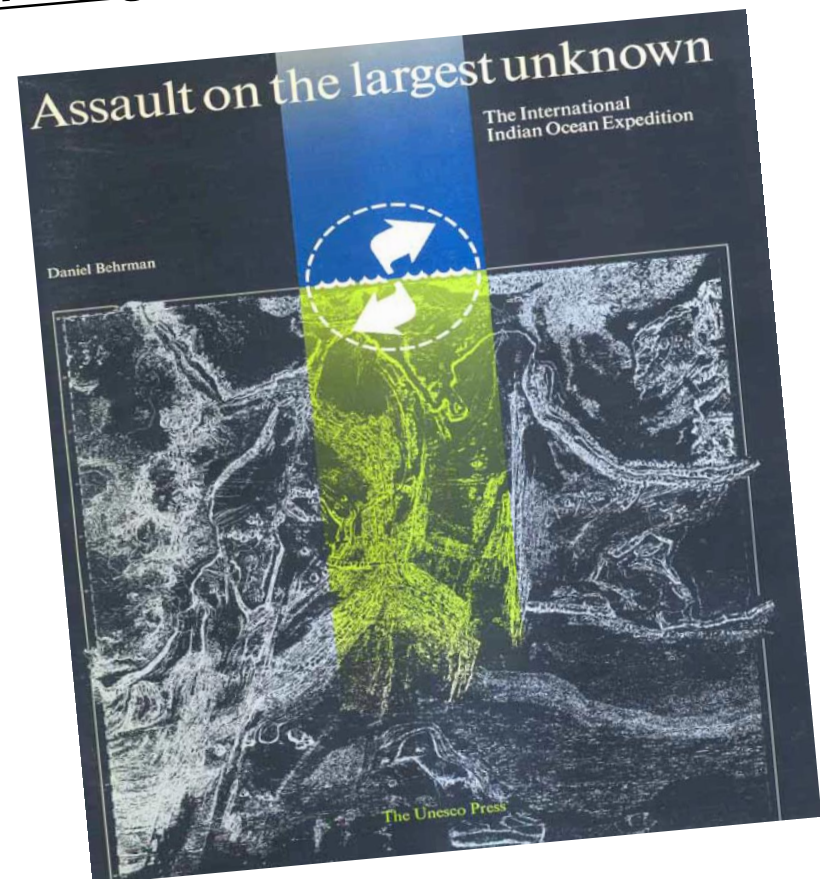
ROBERT G. SNIDER

As a result of a unique set of conditions, the Indian Ocean is possibly the most productive of all the oceans, biologically. Virtually nothing is known about it at the present time but it will undoubtedly become the best understood of all the major bodies of water after this multi-nation effort.

- Organized by Scientific Committee on Oceanic Research - SCOR

www.scor-int.org/IIOE_History.htm

- 1959 - 1965
- 40 research vessels from 25 countries



IOC

IIOE - Background

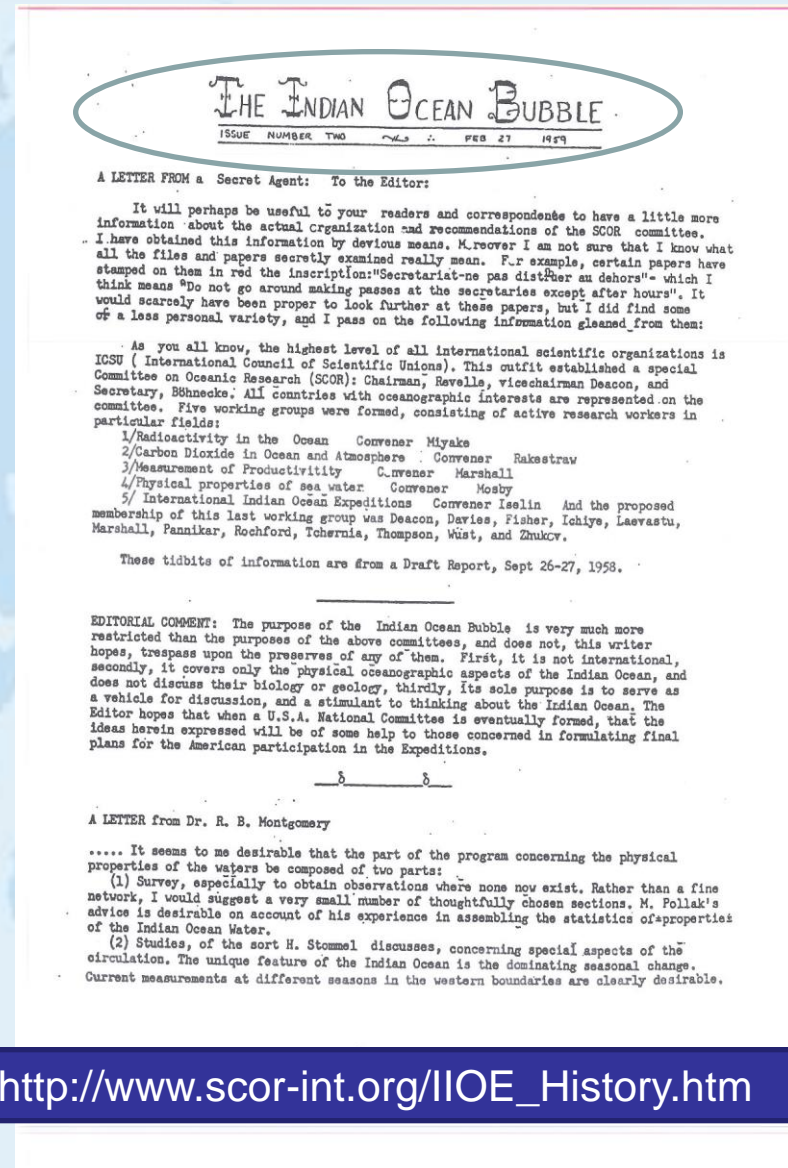
In the International Geophysical Year of 1957-1958, International Council of Scientific Unions (now the International Council for Science) established SCOR.

Following the 1st meeting of SCOR at Woods Hole in 1957, SCOR identified 'Indian Ocean as the greatest unknown in the global ocean' and envisioned the exploration of Indian Ocean as its first task.

Many scientists in USA got interested in the idea and started communicating through an informal news letter called 'The Indian Ocean Bubble'.

SCOR appointed Robert G. Snider as Coordinator for the IIOE in 1959, and he continued in this post until the end of 1962, when the management of the expedition was transferred to IOC.

IIOE was thus the first major programme of IOC



http://www.scor-int.org/IIOE_History.htm

Courtesy: Sathesh Sheno, INCOIS, India

IIOE - Background



Total 323 ship months (approx.)

- 1)Australia – 37
- 2)France – 20
- 3)Germany – ?
- 4)India – 24
- 5)Indonesia – 3
- 6)Japan – 20
- 7)Pakistan – 8
- 8)Portugal – 3
- 9)South Africa – 13**
- 10)Thailand – 2
- 11)USSR – 20
- 12)UK – 35
- 13)USA - 119

UNESCO published 8 volumes of collected reprints of IIOE

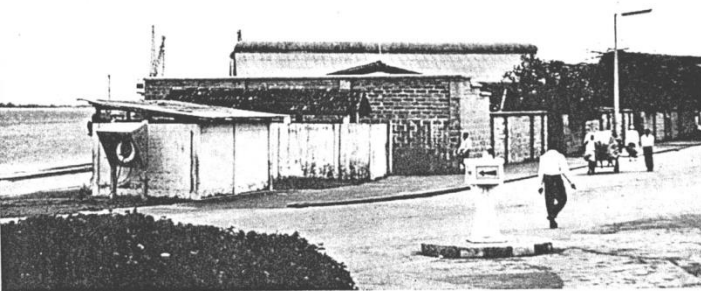
IIOE (1959-1965) officially ended in 1965 – peaked during

IIOE ended in India with a Post Graduate level training programme (25 trainees) held in Mumbai (sponsored by UNESCO and CSIR) + **birth of NIO on 1 January 1966.**

See the SCOR website – IIOE history, documents

Courtesy: Satheesh Sheno, INCOIS, India

Early Marine Institutions in WIO region



Above: EAMRFO, Zanzibar, & below, its successor, IMS.



- East African Marine Research Organization (EAMRFO), established in 1953 in Zanzibar, with sub-station later in Mombasa
- Marine Biological Station established at Inhaca, Mozambique in 1953
- Marine Research Station established by ORSTOM at Nosy-Be, Madagascar in 1962
- Station Marine de Tulear established in 1961 in Tulear, Madagascar established by the University of Marseilles

Planning and Coordination of IIOE

- Organized by IOC and SCOR (contribution of WMO/FAO)
- Reference Group meetings in 2013 in India and China
- IOC Governing bodies approved as special programme
- SCOR will develop research plan (with IOC & IOGOOS)
- IOC Regional Subsidiary bodies formulate their contribution to and involvement in IIOE-2 in line with research plan
- Interim Planning Committee established

Launch conference in Goa, India November 2015

IIOE-2 planning in WIO - March 2014

- IIOE-2 will provide an opportunity to enhance our understanding of the Indian Ocean and address knowledge gaps, especially in the WIO region (this includes issues such as ocean-atmosphere coupling, prediction of extreme weather, what's going on in the water column and if it affects/cause the dipole, upwelling and its relation to productivity and food production,
- Science to governance, knowledge transfer to government structure, and societal benefits of research results
- IIOE-2 will provide an excellent opportunity for public awareness and public advocacy related to ocean issues

IIOE-2 planning in WIO - March 2014

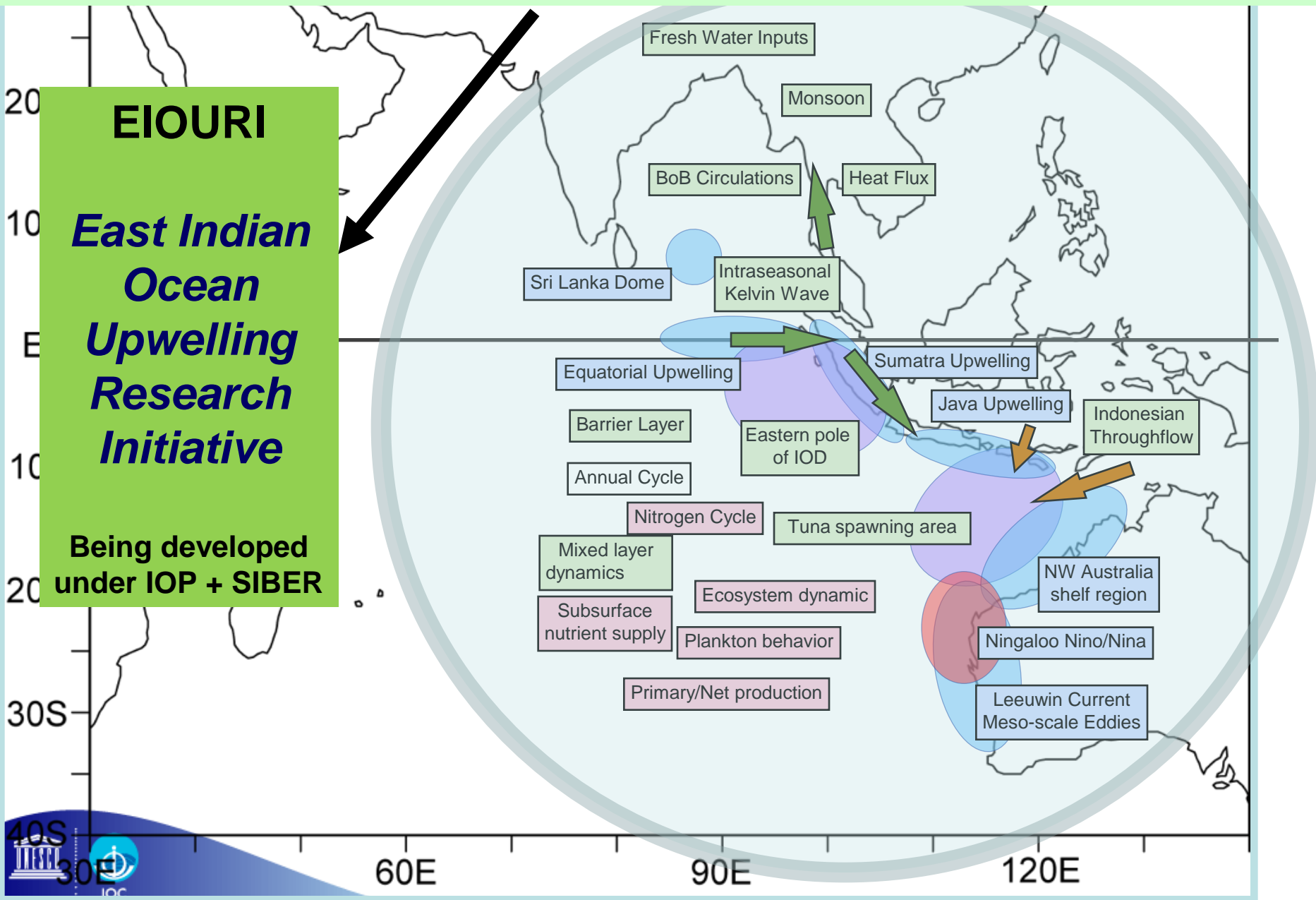
- There is need to develop a common unifying theme that will ensure that IIOE-2 leaves a bigger legacy in the region.
- IIOE-2 provides an opportunity for capacity development at all levels. Structured approach should be developed to ensure optimal use of these opportunities.
- Experts/institutions in the region need to be actively involved in the cruises and other observation systems implemented in the region, including contributing their planning.

A major research initiative in gestation under IOP + SIBER, bringing together > 30 international experts and institutions for an upwelling study to be run under the spirit of an IIOE-2.

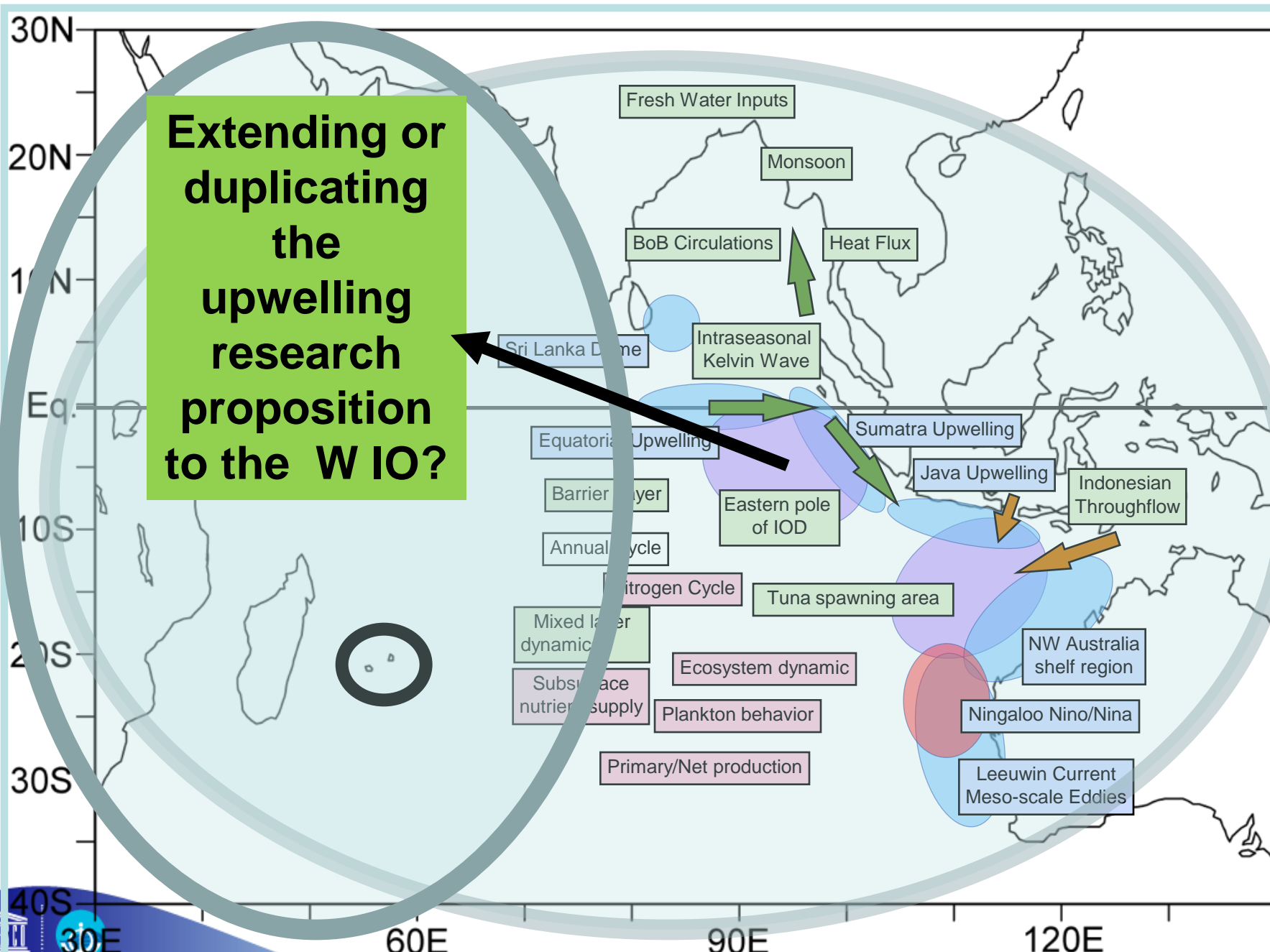
EIOURI

East Indian Ocean Upwelling Research Initiative

Being developed
under IOP + SIBER



Extending or duplicating the upwelling research proposition to the W IO?



30E

60E

90E

120E

Large scale upwelling processes in region

- Agulhas Current driven upwelling;
- Upwelling in the Mozambique Channel;
- Madagascar Ridge (MAD Ridge) (upwelling caused by seamounts);
- Southern Madagascar and the eastward chlorophyll bloom;
- Upwelling in the East African Coastal Current (EACC) and influence of major islands;
- Somalia Current system;
- Oman upwelling system;
- Chagos-Seychelles upwelling dome and
- Mascarene Plateau induced upwelling

WIO Planning and Coordination for IIOE

IOCAFRICA and WIOMSA

- Establish a sub-regional coordination mechanism to:
Compiling information on on-going and planned cruises
- Facilitate planning and implementation of joint IIOE-2 activities in the WIO
- Mobilize resources
- Facilitating participation of regional scientists in the planned cruises
- Raise awareness about IIOE-2 in the region

An underwater scene featuring various marine life such as fish, squid, jellyfish, and a large school of fish. Scientific equipment, including a yellow and black vertical probe, a red and white buoy, and other sensors, are visible in the water. The background shows a rocky coastline and the surface of the ocean.

Thank you!
Asante Sana!

www.ioc-unesco.org



1960-2010