IIOE-2 Data & Information Management

Cyndy Chandler
Woods Hole Oceanographic Institution
co-chair IIOE-2 WG-2

About the Speaker

- Oceanographer Emerita, WHOI
- Co-chair, IODE, IOC of UNESCO
- Co-chair, IIOE-2 WG2
  Data & Information Management

Co-authors

Tobias W. Spears, DFO – BIO (Canada)
Pauline Simpson, Central Caribbean Mar. Inst. (Cayman Islands)
Peter J. Pissiersens, UNESCO/IOC-IODE Secretariat (Belgium)

IIOE-2 WG2 (Data & Information Management) members:
Harrison Ong'anda, co-chair (Kenya)
Roger Proctor (Australia)
E. Pattabhi Rama Rao (India)
Nelly Florida Riama (Indonesia)
Abdullah Bin Sulaiman (Malaysia)
Ntahondi Mcheche Nyandwi (Tanzania)

OUTLINE

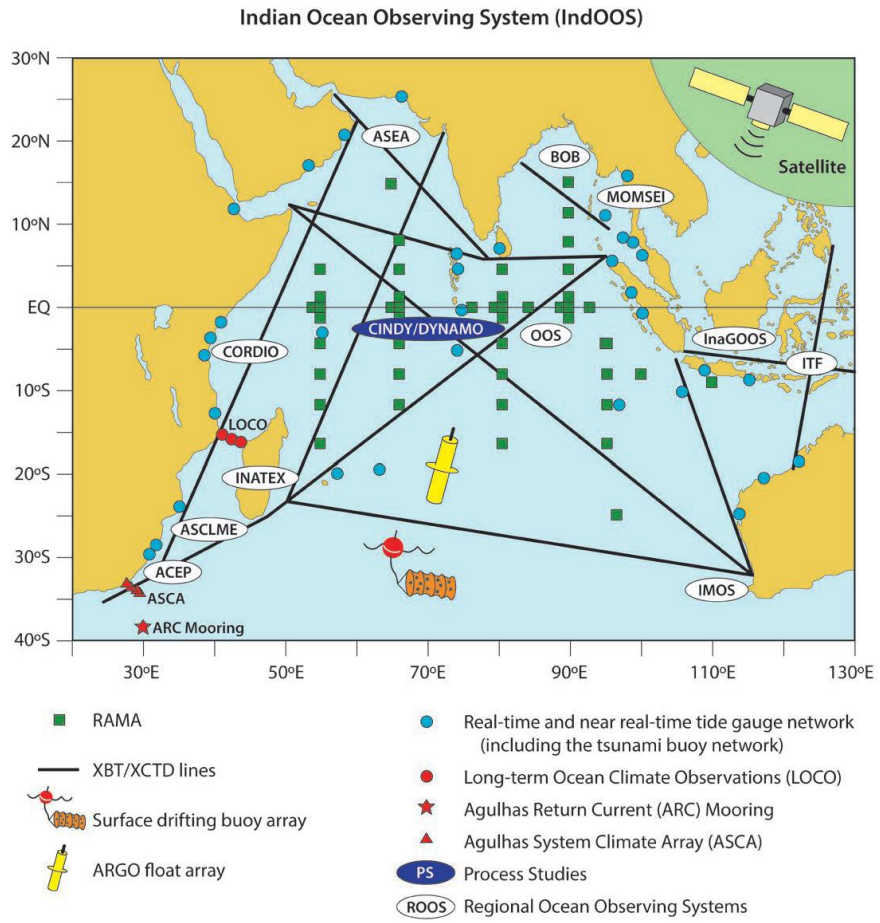
- IIOE-2 program info
  - Science and implementation plans
  - Program governance & coordination

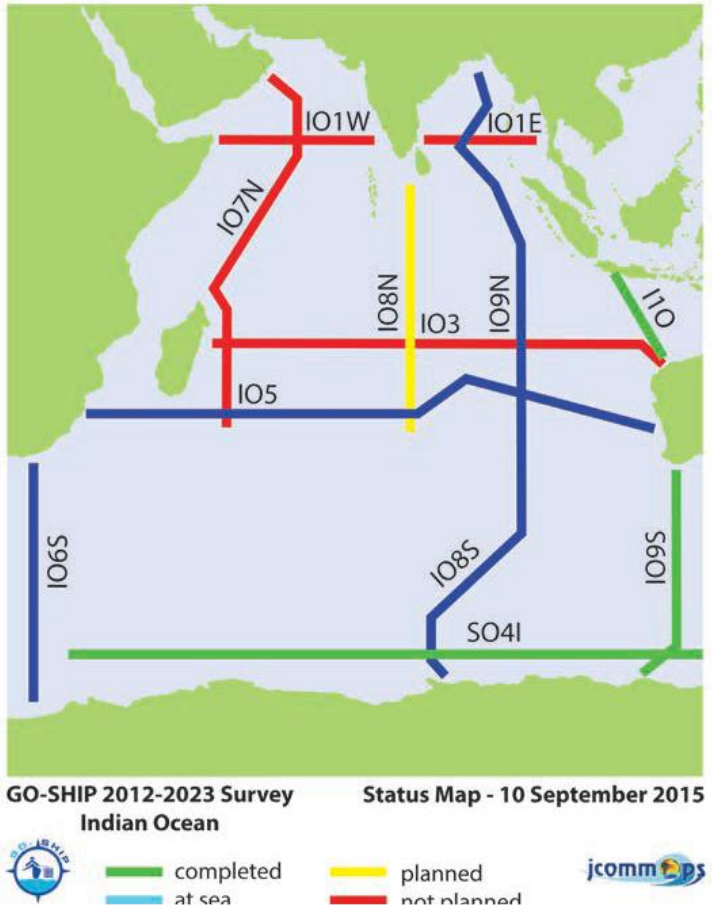
- Data & information strategy and implementation for IIOE-2

IIOE-2 Science Themes

1. Human benefits and impacts
2. Boundary current dynamics, upwelling variability and ecosystem impacts
3. Monsoon variability and ecosystem response
4. Circulation, climate variability and change
5. Extreme events and their impacts on ecosystems and human populations
6. Unique geological, physical, biogeochemical, and ecological features of the Indian Ocean

IIOE-2 deployment of multiple platform types: In Situ Observations, Remote Sensing and Modeling





Source: *Hood et al (2015) IIOE-2 Science Plan*

IIOE-2 Program Governance

- Sponsors: IOGOOS, SCOR and IOC-UNESCO
- Scientific Steering Committee
- Science Theme and Working Groups
- Joint Program Office
  - IOC Perth Program Office, Australia
  - Indian National Centre for Ocean Information Services (INCOIS)
- Regional and National Coordination entities
- Regional Coordination Unit for IIOE-2 D&IM hosted at INCOIS in Hyderabad, India

IIOE-2 WG-2 D&IM Activities

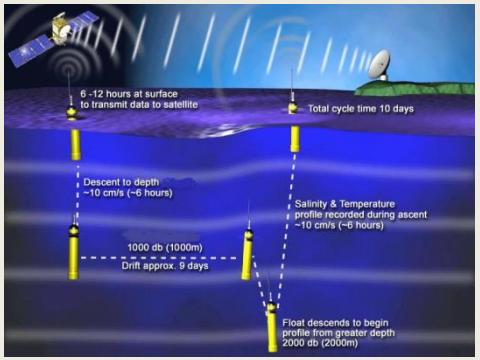
- Publish an IIOE-2 Data Policy
- Agree on list of core measurements
- Agree on sampling and analytical protocols
- Agree on quality control/assurance procedures
- Maintain metadata catalogue
- Dissemination of IIOE-2 data
- Long-term preservation of IIOE-2 data
- Develop ancillary information systems for IIOE-2
- Capacity building in the region
- Establish Regional Coordination Unit at INCOIS

A lot to accomplish with limited funding

http://ccctechedge.org/images/

IIOE-2 Data Access System

http://www.iioe-2.incois.gov.in/IIOE-2/data.jsp



IIOE-2 Data Policy (draft)

- FAIR data principles
  https://www.go-fair.org/fair-principles/
  Findable + Accessible + Interoperable + Reusable
- Digital Object Identifier (DOI)
  https://dx.doi.org
- Open Researcher and Contributor ID (ORCiD)
  https://orcid.org/

IIOE-2 Metadata & Data Portal

http://www.iioe-2.incois.gov.in/IIOE-2/data.jsp

Catalog of projects, cruises, moorings, datasets ...

Hosted at INCOIS (Hyderabad, India)

Data Dissemination and Long-term Preservation of IIOE-2 data

- Combination of: IODE network of NODCs and ADUs (OBIS nodes) and INCOIS IIOE-2 portal

IODE

National Oceanographic Data Centre **NODC**

Associate Data Unit **ADU**

+

IIOE-2

DATA & METADATA PORTAL

Proposed Flow of IIOE-2 Data

Project metadata -------> ------------------->

Platform metadata ------> ------------------->

Acquisition → **Data Center** → **INCOIS**

~~Data Center~~

IODE National Oceanographic Data Centre **NODC**

Associate Data Unit **ADU**

IIOE-2 DATA & METADATA PORTAL

Dataset metadata -------> ------------------->

Dataset packages -------> ------------------->

IOC Member State NODCs

NODCs in IIOE-2 participant nations

Australia	Japan
Bangladesh	Kenya
China	Madagascar
Germany	Norway
India	South Africa
Indonesia	UK
Italy	USA

IIOE-2 Core Measurements

- Agree on a list of core measurements
- Agree on quality control/quality assurance procedures
- Agree on sampling & analytical protocols

✓GOOS EOVs and EBV (modify as needed)

✓All protocol document to OceanDocs

✓Coordinated through ST chairs, and SSC

Leveraging IODE Capabilities and Services

IODE Network:

- National Oceanographic Data Centres (NODCs)
- Associate Data Units (ADUs)
- Ocean Biogeographic Information System (OBIS)
- Associate Information Units (AIUs)
- Projects and Activities
  - Services, Documentation, Resources

Promote Ancillary Information Systems

- Making use of existing IODE platforms: OceanExpert, OceanDocs, ODS, OBP for ancillary information associated with IIOE-2

1. Ocean Expert: https://www.oceanexpert.net/
2. Ocean Docs: http://www.oceandocs.org/
3. Ocean Data Standards: http://www.oceandatastandards.org/
4. Ocean Best Practices: https://www.oceanbestpractices.net/

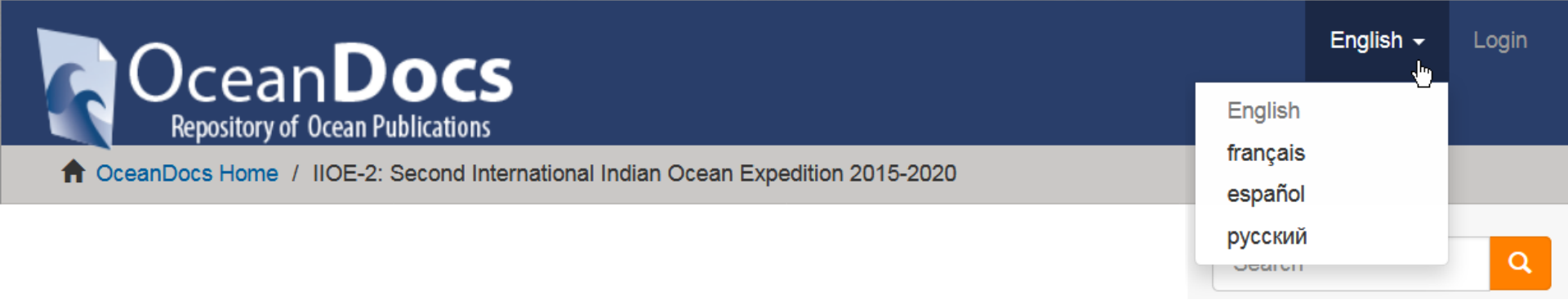
United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

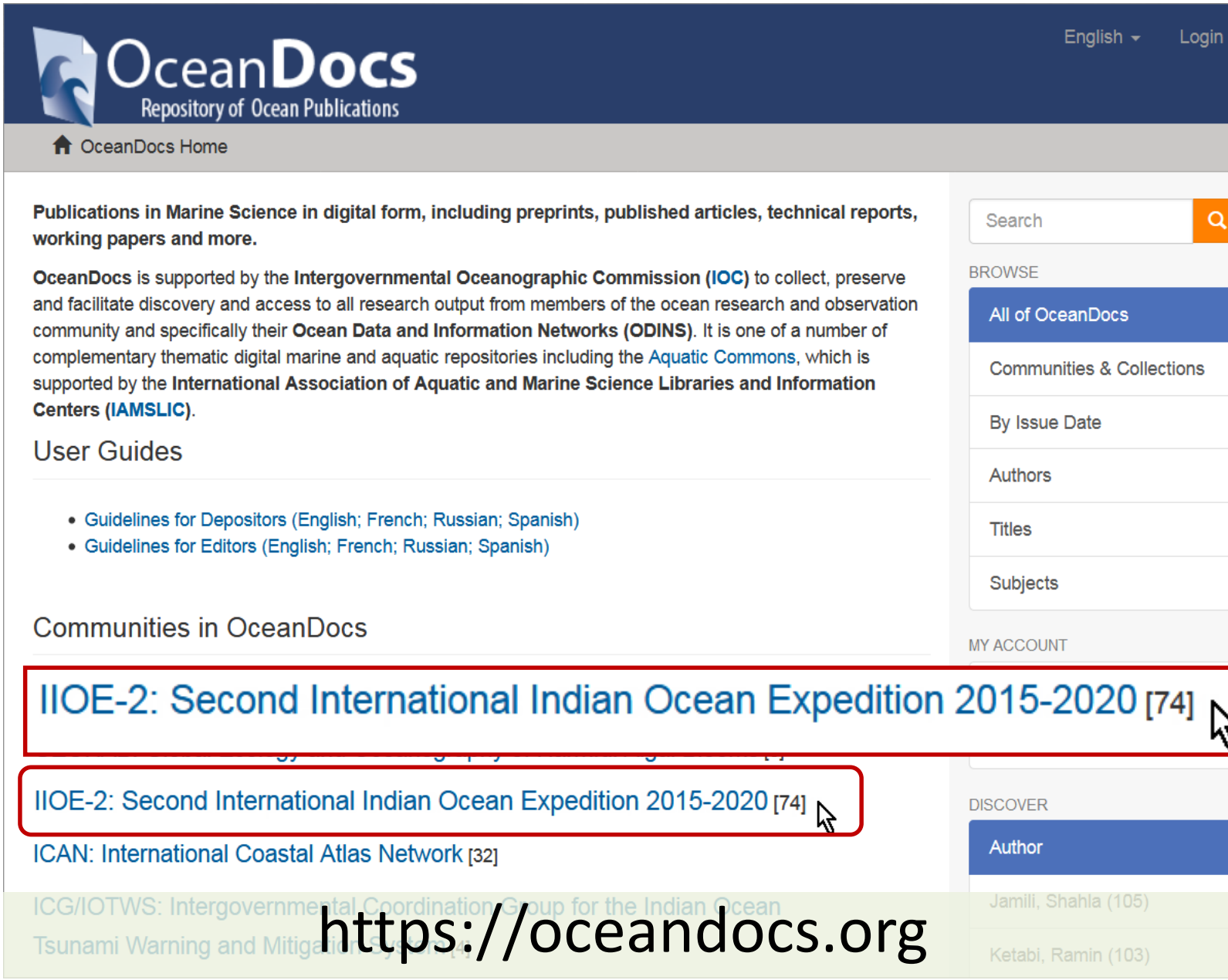
IODE

Ocean Expert

registry of people; members of the marine research community



- Open access repository of marine publications
- Hosted by IOC of UNESCO IODE
- Permanent, secure archive of documents
- IIOE-2 branding; link to IIOE-2 Web site
- Export tools (Bibliographic Software)
- Harvested/indexed by search engines
- Persistent identifiers



Ocean Docs

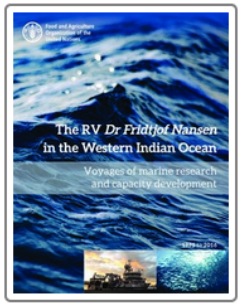
https://oceandocs.org

C.Chandler
IIOE-2 Data & Info Mgt
IMDIS, Nov 2018

Recent Submissions

IIOE-2 Newsletter, Volume 2, Nr 1, January 2018

Indian National Centre for Ocean Information Services (ESSO - Indian National Centre for Ocean Information Services (INCOIS) Hyderabad, IndiaHyderabad, India, 2018)



The RV Dr Fridtjof Nansen in the Western Indian Ocean: voyages of marine research and capacity development. [1975-2016]

Groeneveld, Johan C.; Koranteng, Kwame A. (Food and Agriculture Organization of the United Nations (FAO)Rome, Italy, 2017)

Marine scientists and oceanographers from many countries have cooperated on research in the Indian Ocean since the end of the 1950s. This collaboration stemmed from the International Indian Ocean Expedition (IIOE), which ...

IIOE-2 Cruise No.EP1-1, 4 December, 2015 - 22 December 2015, Goa, India - Mauritius. ORV Sagar Nidhi Cruise 105 (04 – 22 December 2015) International Indian Ocean Expedition - 2, First Expedition.

Vinayachandran, P.N.; Prakash, Satya (Indian Institute of Science, Centre for Atmospheric and Oceanic SciencesBangalore, India, 2015)

SN-105 is the first cruise conducted as a part of the Second International Indian Ocean Expedition (IIOE-2). IIOE-2 was launched as well as SN-105 was flagged off at Goa by the Minister of State for Science and Technology, ...

D'Adamo, Nick (9)
et al (5)
Hood, Raleigh (3)
Prakash, Satya (3)
Kothandaraman, Dinesh (2)
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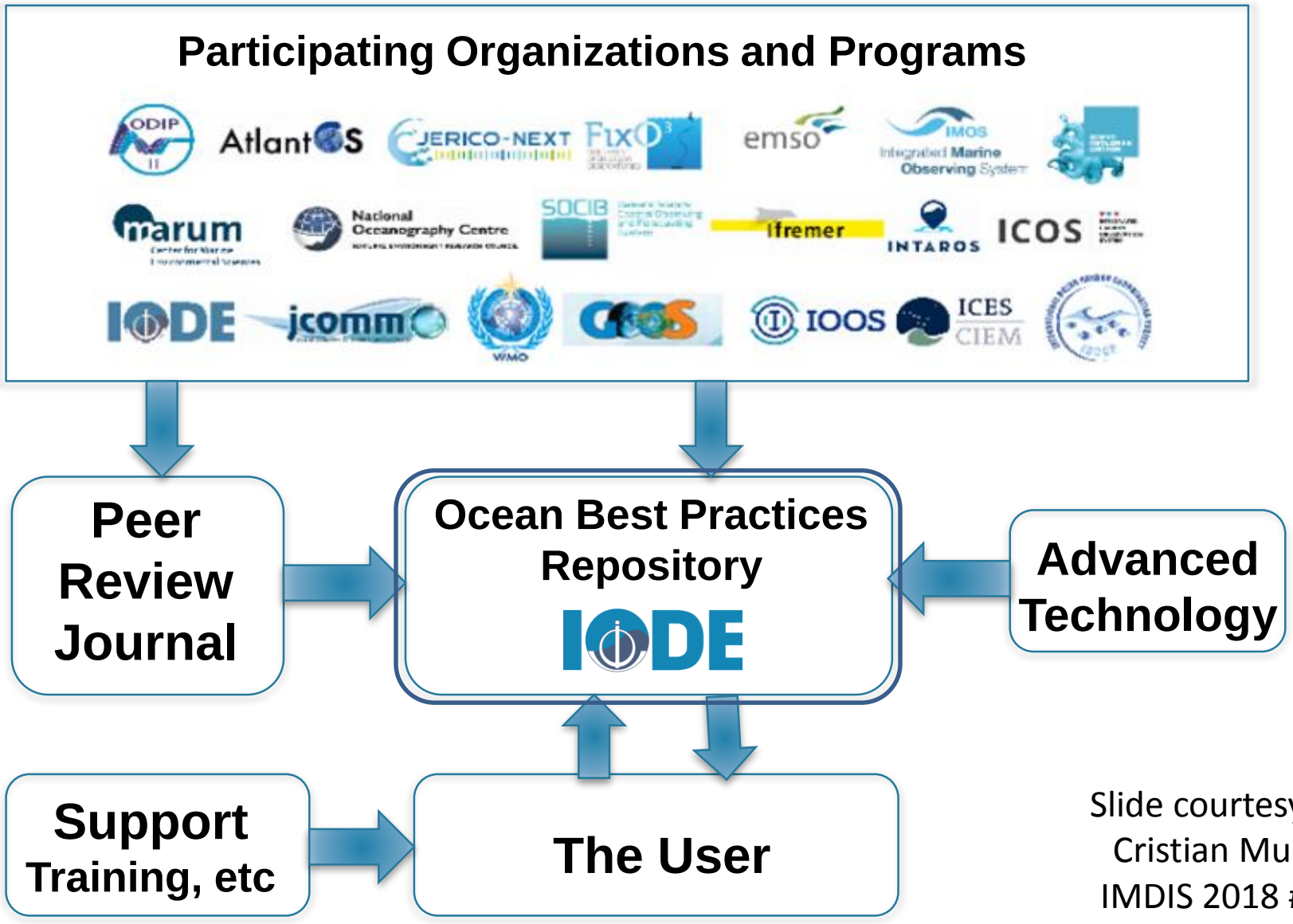
Articles (in Journals, Reports etc) (IIOE-2) [6]

https://www.oceanbestpractices.net/

- open access, permanent, digital repository
- of community best practices in ocean-related sciences
- DOIs provided for submitted documents
- contents indexed by all the major search engines and harvested by Google Scholar, Scopus, OpenAIRE, ASFA etc.

Ocean Best Practices System



Slide courtesy of
Cristian Muñoz
IMDIS 2018 #38
Abstract # 69

OceanTeacher Global Academy

sharing training resources and expertise in a coordinated way

> 2 700 people trained from 134 Member States

> 4 700 registered users

> 200 training courses

Learning Services Provider

ISO 29990: 2010

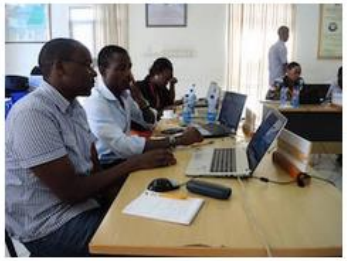
Belgium
China
Columbia
Senegal
India
Iran
Kenya
Malaysia
Mozambique

Slide courtesy of
Claudia Delgado
IODE OTGA

Capacity Development

- Using generic courses and developing IIOE-2 customized course modules from IODE Ocean Teacher Global Academy (OTGA)
- OTGA online courses: http://classroom.oceanteacher.org/

Five OTGA Regional Training Centers in the Indian Ocean Region


KENYA

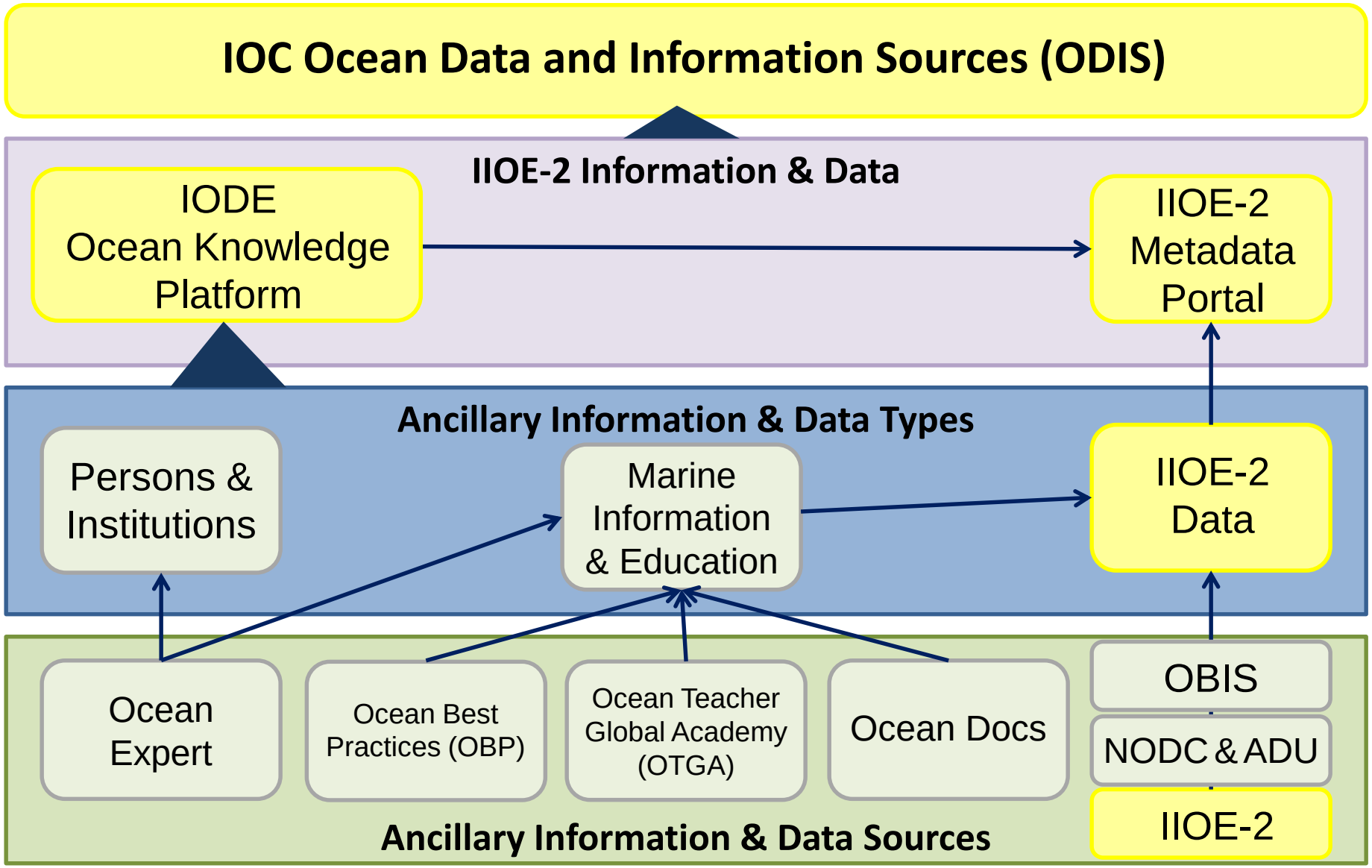

MOZAMBIQUE


INDIA


IRAN


MALAYSIA

Data and Information System for IIOE-2



QUESTIONS . . . DISCUSSION

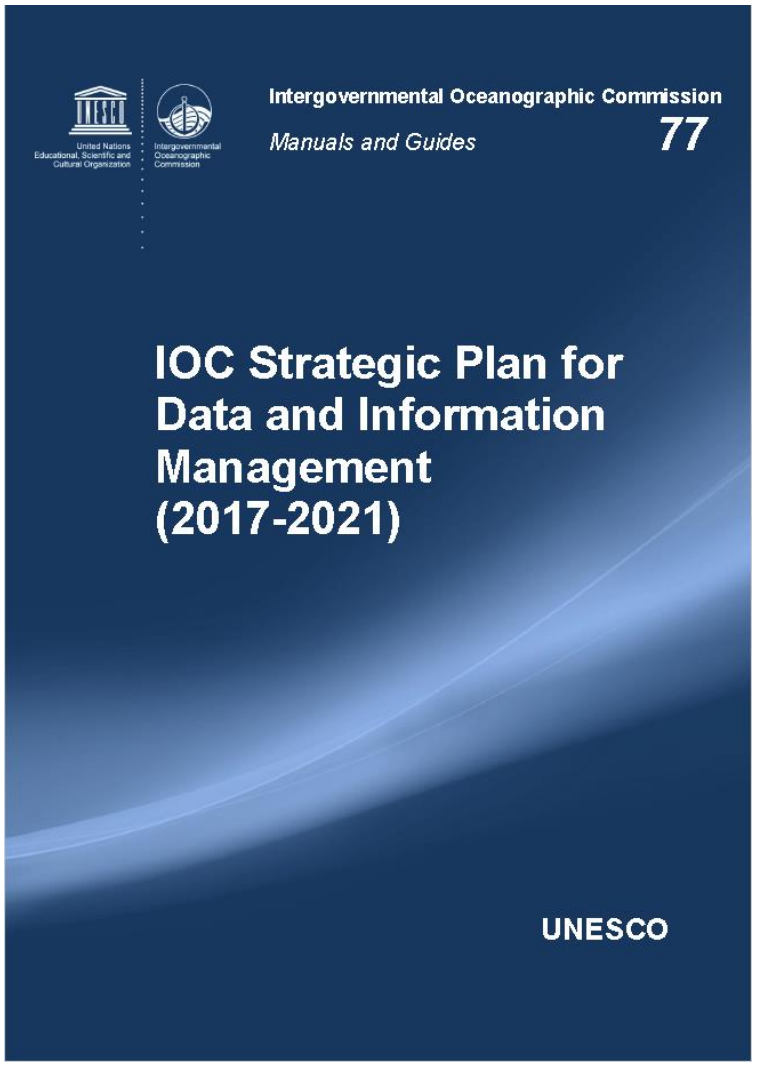
Basic scientific research requires good data management practices and one of the overarching objectives of IIOE-2 will be to support the collection and curation of all data to encourage data sharing using internationally agreed rules of data exchange, and to facilitate data discovery and future use. (IIOE-2 Data Policy)

ADDITIONAL SLIDES

- these are out of the scope of this talk … but, included them just in case …

1. IOC strategic plan
2. PID details

Ancillary Information Systems of IOC



IOC
Manuals and Guides
No. 77

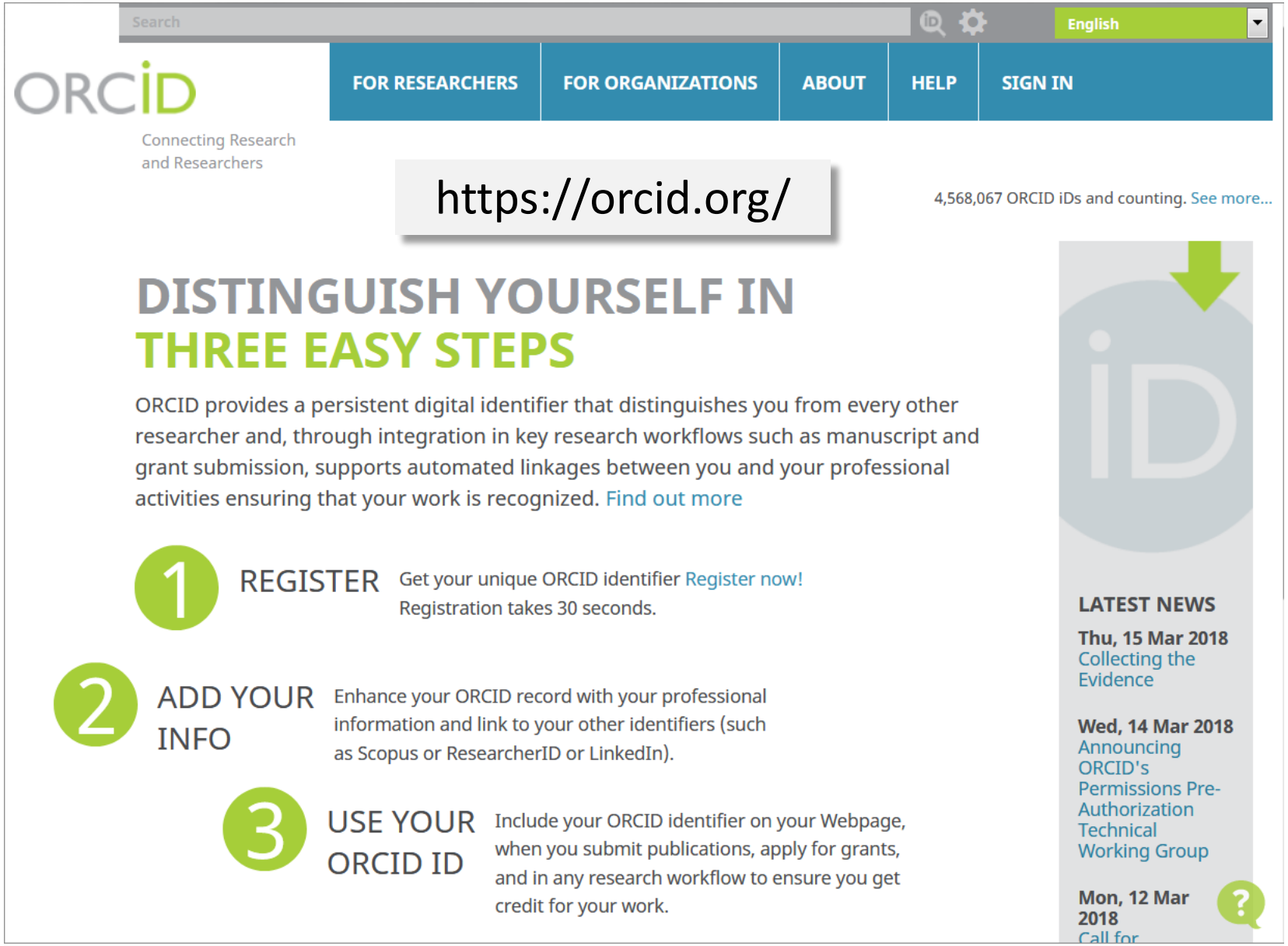
Strategic plan to support IOC Medium-Term Strategy

Data & Information Systems of IOC

(IOC MG77: 2017 – 2021)

6 FUNCTIONS of IOC

- A. Ocean Research
- B. Observing System & Data Management
- C. Early Warning & Services
- D. Assessment Information for Policy
- E. Sustainable Management & Governance
- F. Capacity Development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3 USE YOUR ORCID ID
Include your ORCID identifier on your Webpage, when you submit publications, apply for grants, and in any research workflow to ensure you get credit for your work.
LATEST NEWS
Thu, 15 Mar 2018
Collecting the Evidence
Wed, 14 Mar 2018
Announcing ORCID's Permissions Pre-Authorization Technical Working Group
Mon, 12 Mar 2018
Call for

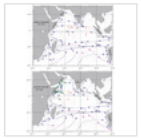
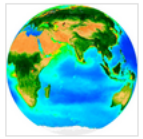
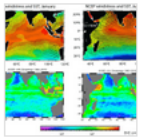
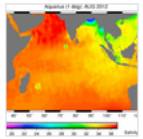
Digital Object Identifier (DOI)

- DOI resolver: https://dx.doi.org

- Assigned by: NODC, ADU, OBIS node or by INCOIS, the IIOE-2 Data Center

- Used to reference digital objects (e.g. data sets) in researcher CV, annual reports, IIOE-2 Newsletter, and in peer-reviewed literature

Outline

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Progress in Oceanography
Volume 156, August 2017, Pages 290-325

Review

Biogeochemical and ecological impacts of boundary currents in the Indian Ocean

Raleigh R. Hood [a], Lynnath E. Beckley [b], Jerry D. Wiggert [c]

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https://doi.org/10.1016/j.pocean.2017.04.011

Highlights

- Indian Ocean (IO) boundary currents are complex compared to the Atlantic and Pacific.
- The currents in the northern IO reverse seasonally and have large biological impacts.
- The Leeuwin Current flows poleward and sheds seaward-propagating eddies.
- The Agulhas Current is very large and generates eddies that

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Raleigh Hood
ORCID ID
https://orcid.org/0000-0002-7248-3481

Lynnath Beckley
ORCID ID
https://orcid.org/0000-0001-6872-7896

Jerry Wiggert
ORCID ID
https://orcid.org/0000-0001-8665-0773

Outline

Highlight
Abstract
Keyword
1. Introd
2. The seasonally reversing currents of the…
3. The Southward-Flowing Leeuwin Current
4. The Agulhas Current and its tributaries
5. The recent paleoceanographic history of…
6. Summary and conclusions
Acknowledgements
References

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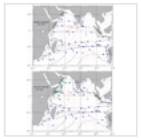
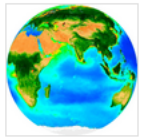
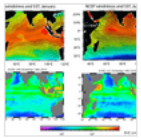
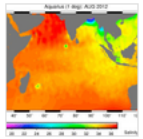

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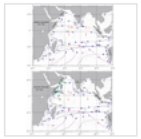
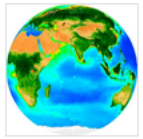
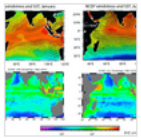
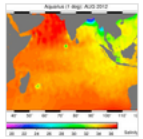

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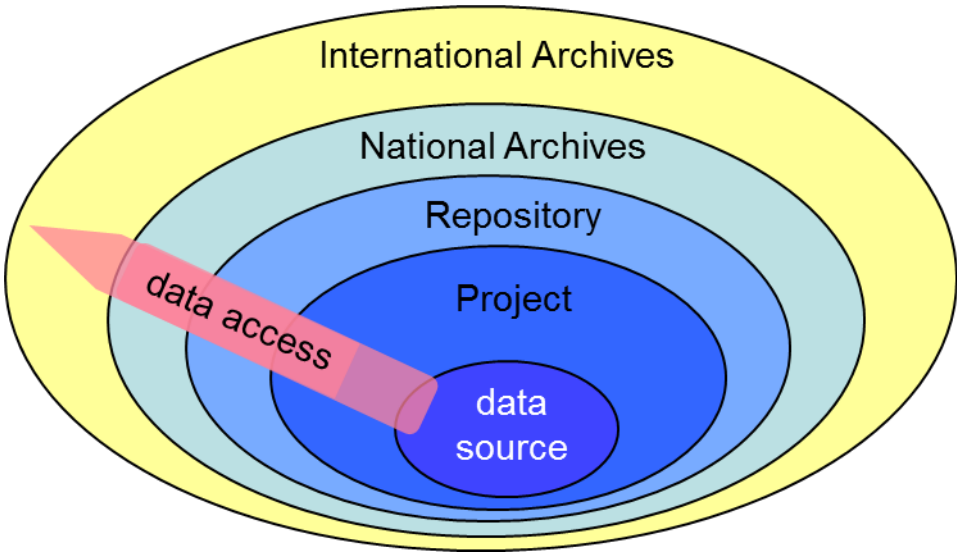
Data & Information Sharing & Exchange

- "Changes in data access effect changes in expectations by a variety of stakeholders - scientists, educators, technologists, policy-makers and these changes lead to expanded responsibilities associated with data and information management."

(Baker & Chandler, 2008)



Issues, Challenges, Concerns

- Metadata catalog
- Core parameters
- Cultural