



International activities around
AP-MBON
and
Biodiversity observations in AO-marine

Take Yamakita (JAMSTEC)

- *Today's Topics*
- What's GOOS
- What's MBON & American Activities
- APMBON Member's Activities
- Topics in Oceania



Formally launched AP MBON
Structure of organization:

Steering committee:

Chair: Massa Nakaoka (Akkeshi Marine Station Hokkaido University),
Costello, Shirayama, Lim, Prathep, Amri, Muslim

Secretary Office: in JAMSTEC

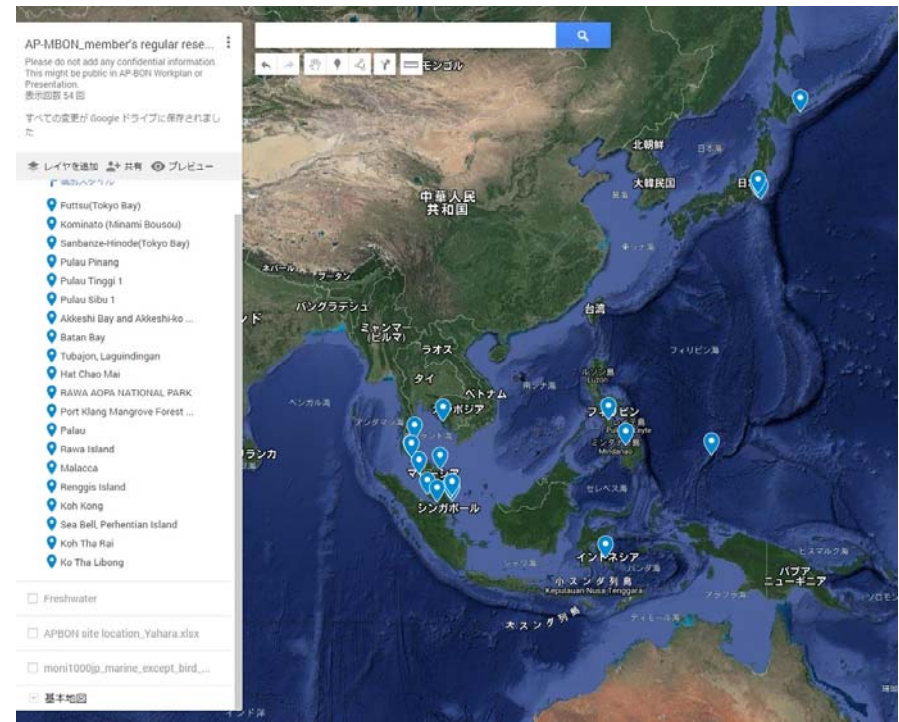
Secretary General: Takehisa Yamakita
members in GODAC JAMSTEC
(<http://www.godac.jamstec.go.jp/bismal/e/>)

Website under GeoBON

...Fundraising, SNS ...etc



Potential research sites (tentative)



Australia? and Pacific island?



- [Home](#)
- [Working Groups](#)
- [Observation Networks](#)
- [Task Forces](#)

The presentation on this map do not imply the expression of any opinion whatsoever on the part of the GEO BON Secretariat concerning the legal status of any country, territory, city or of its authorities, or concerning the delimitation of its boundaries.

AP-MBON

AP-MBON furthers the development of marine biodiversity science in the Asia – Pacific region, as a sub-group of the [MBON](#) and [Asia-Pacific BON](#) networks of GEO BON. Its Secretariat is hosted at [GODAC in JAMSTEC](#) and can be contacted to: j-obis_jam@jamstec.go.jp. To join, please sign up to GEO BON here, and then select AP-MBON. To join, please click the Register button, and then select AP-MBON as your group of interest. [Register](#)

The geographic scope of AP-MBON extends from pole to pole through Asia and the western Pacific, including the Pacific islands and the Indian Ocean. It includes the deepest ocean trenches, and the Coral Triangle, the highest density of marine species on Earth, as well as the highest densities of human populations.

AP-MBON activities focus on networking researchers in the region, encouraging staff and student exchanges between laboratories, and fostering a community of practice in marine biodiversity monitoring. We welcome specialist subgroups, such as focusing on particular ecosystems (e.g., coral reefs), biomes (e.g., seagrass), habitats, taxa and threatened species, marine reserves). Our vision is to enable reporting of trends in marine biodiversity from local to regional scales to better inform society of the state of biodiversity and how to benefit from and conserve it.

BON Co-Leads



Masahiro Nakaoka
Hokkaido University, Akkeshi Marine Station

I am studying community ecology in coastal ecosystems, specially focusing on seagrass beds in East and Southeast Asian regions. I am also interested in ecosystem service assessment of these habitats.



Takehisa Yamakita
Japan Agency for Marine-Earth Science and Technology

I am working to predict marine biodiversity and ecosystem services national or Regional scale to support conservation policy. Impact assessment of disaster and development is also my duty.

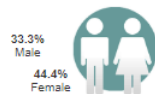


BON Statistics

Realm studied



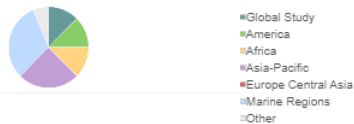
% Gender Balance



Earth Observation approach



% Geographic Zone studied



Geographic zone studied in detail



9 BON Members

AP-MBON

Show 25 entries | [Excel](#) | [CSV](#) | [PDF](#)

First name	Last name	Institute	Country or Region	Realm studied	Earth Observation	Working Group	Observation Network
Aileen Tan	Shau Hwai	Centre for Marine and Coastal Studies (CEMACS), Universiti Sains Malaysia	Malaysia	Marine			Marine BON, AP-MBON, Asia-Pacific BON
Cherrie	Teh	Universiti Sains Malaysia	Malaysia	Marine	N.A.		Marine BON, AP-MBON, Asia-Pacific BON
Frederic	Bonou	l'Institut de Recherches Halieutiques et Océanologiques du Bénin (IRHO)	Benin		Remote Sensing, In Situ	Ecosystem Structure, Ecosystem Function, Ecosystem Services, BON Development	Marine BON, AP-MBON, Freshwater BON,
Heath	Cook	Cornell University	USA	Marine	In Situ	Community Composition	Marine BON, AP-MBON, Asia-Pacific BON
Jonatha	Giddens	National Geographic Society Exploration Technology Lab	USA	Marine	In Situ		Marine BON, AP-MBON, Asia-Pacific BON
Masahiro	Nakaoka	Hokkaido University, Akkeshi Marine Station	Japan	Marine	In Situ		Marine BON, Asia-Pacific BON, AP-MBON
T. E. Angela	Quiros	Hokkaido University, Akkeshi Marine Station	Japan	Marine, Terrestrial	In Situ		AP-MBON, Marine BON, Asia-Pacific BON
Takehisa	Yamakita	Japan Agency for Marine-Earth Science and Technology	Japan	Marine	Remote Sensing, In Situ		Marine BON, AP-MBON, Asia-Pacific BON



A Global Collaboration: OBIS + GOOS (IOC) and MBON

GEO BON/MBON – GOOS BioEco – OBIS partnership
**Building a globally coherent, consistent and coordinated
sustained global ocean observing system to assess the state of
the ocean's biological resources and ecosystems**

Requirements



- Focus on sustained observations
- Bring selected EOVs from pilot to mature
- Link with platforms and observing systems of GOOS and GRAs

Observations



- R&D focus
- Bring new EOVs from concept to pilot
- Assist with the establishment of national and regional BONs

Data & Products



- Open data sharing
- Data integration
- Data quality control
- Data harmonization
- Tools for data exploration, visualization and analysis

Products,
Indicators,
Assessments

e.g.: <http://iobis.org/2016/12/15/goosgeobonobis/>

GRF-9
Ninth GOOS Regional Alliances
Forum 5 - 7 August 2019, Tokyo,
Japan



- **Key component of GOOS**
- **expert panels for physics, biogeochemistry, and biology and ecosystems** that synthesize across requirements and provide guidance on observing system design
- **the Observations Coordination Group and the GOOS Regional Alliances** that implement observing systems and ensure the flow of observations across the global networks and regional observing structures
- **GOOS Projects** that advance innovation and expand into **new areas for the observing system**
- Core coordination through the **GOOS Steering Committee and a distributed GOOS Office.**

Strategic objectives

- **Deepening Engagement and Impact**

Deepen engagement and partnership from observations to end users to advance the use and impact of the observations and demonstrate their benefits

- 1. Strengthen **partnerships** to improve delivery of forecasts, services, and scientific assessments.
- 2. Build **advocacy** and **visibility** with stakeholders through communicating with key users and national funders.
- 3. Regularly evaluate system impact to assess fit for purpose.
- 4. Strengthen knowledge and exchange around

- **System Integration and Delivery**

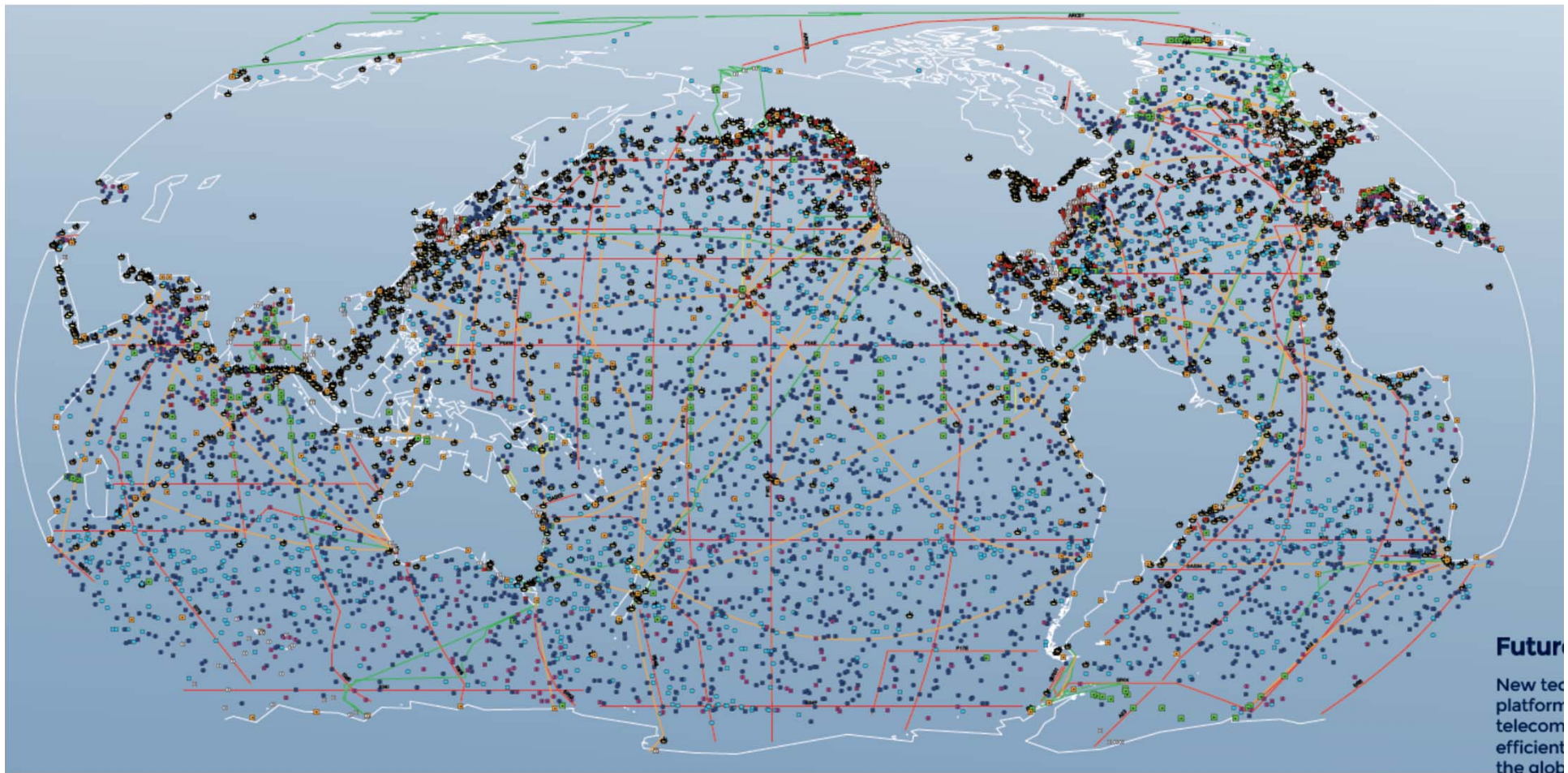
Deliver an integrated, 'fit-for-purpose' observing system built on the systems approach outlined in the Framework for Ocean Observing

- 5. Provide **authoritative guidance on integrated observing system design**, synthesizing across evolving requirements and identifying gaps.
- 6. **Sustain, strengthen and expand observing system** implementation through GOOS and partner communities, promoting standards and best practice, and developing metrics to measure success.
- 7. Ensure GOOS ocean observing data and information are **findable, accessible, interoperable, and reusable**, with appropriate quality and latency.

- **Building for the Future**

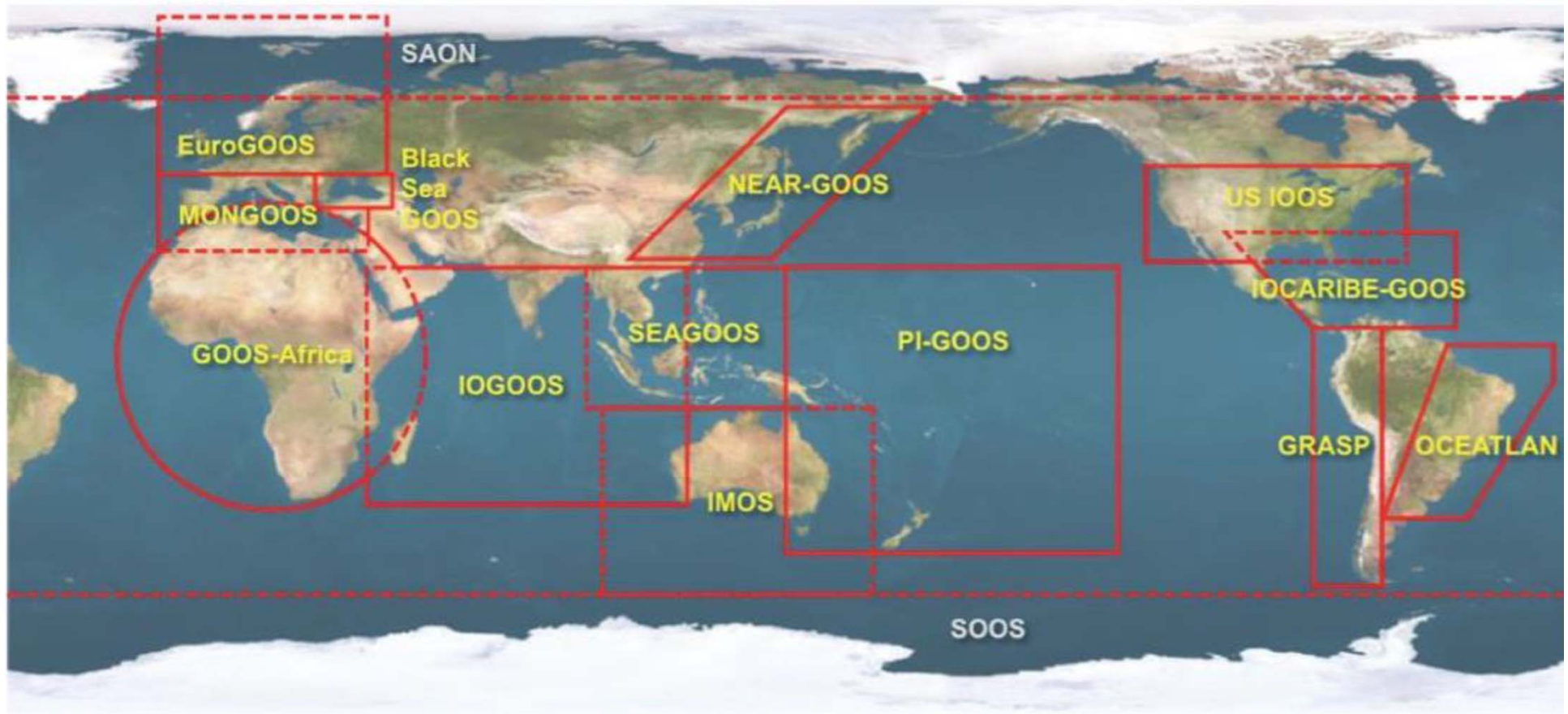
Building for the future through innovation, capacity development, and evolving good governance

- 8. **Support innovation** in observing technologies and networks.
- 9. Develop **capacity** to ensure a broader range of beneficial stakeholder participation.
- 10. **Extend systematic observations** to the ocean.
- 11. Champion **effective governance** for global in situ and satellite observing, together with partners and stakeholders



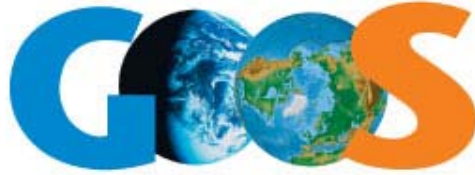
www.jcommops.org/reportcard2018

Regional GOOS



[Tanhua 2018 Frontier Mar Sci](https://www.researchgate.net/publication/335271650)

<https://www.researchgate.net/publication/335271650>



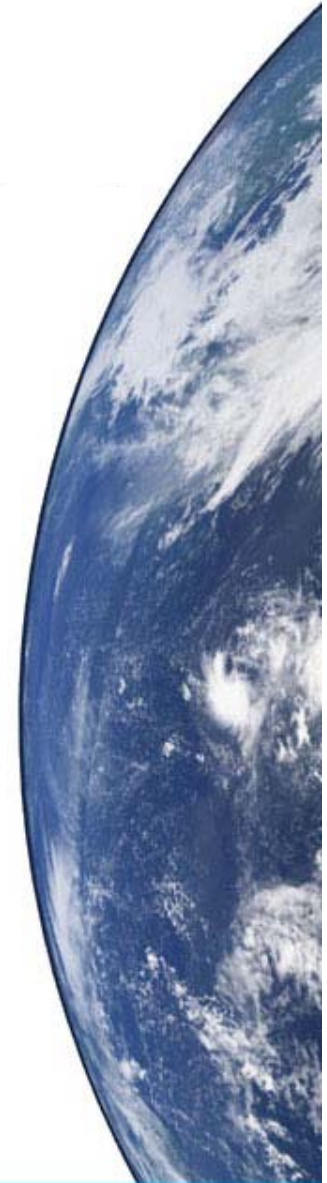
[Example from meeting documents](http://ioc-unesco.org/index.php?option=com_oe&task=viewEventDocs&eventID=2422)

http://ioc-unesco.org/index.php?option=com_oe&task=viewEventDocs&eventID=2422

GRA Background Report **NEAR-GOOS**

Masakazu HIGAKI
Chair, NEAR-GOOS
Japan Meteorological Agency

*GOOS Regional Forum-9,
5-7 August 2019, Tokyo, Japan*



General information

- Type: Intergovernmental network
- Funding characterization: Project funded
- GRA leadership (Chair/coordinator) and contact:
 - Chair: Masakazu HIGAKI (election: 2018, term: 2 years)
 - E-mail: higaki@met.kishou.go.jp
 - IOC/WESTPAC Coordinating Committee (CC) for NEAR-GOOS
 - 2 members from each country
- Secretariat:
 - Mr Wenxi Zhu, Technical Secretary, IOC/WESTPAC
 - E-mail: w.zhu@unesco.org
- Website: <http://iocwestpac.org/north-east-asian-regional-goos/172.html>
- Membership: 8 organizations in China, Japan, Korea, and Russia
- Terms of Reference: <http://iocwestpac.org/north-east-asian-regional-goos/173.html>
- Meetings: (NEAR-GOOS CC)
 - Past 2: 18th Session, 21-22 Nov. 2017, Fuchou, China
19th Session, 14-15 Nov. 2018, Bangkok, Thailand
 - Next: 20th Session, Nov. 2019, Busan, Korea

In what areas would the GRA like to be active?

Value chain element	What resource would be needed?
Observations implementation	Continuation of pilot projects
Data management	Continuation and enhancement of NEAR-GOOS Databases
Forecasting	Release of NEAR-GOOS Ocean Forecasting Systems (OFS)
Service / information delivery	Continuation and enhancement of NEAR-GOOS Databases
Capacity development of members	should be considered
Outreach / ocean literacy	should be considered (e.g. through sessions in WESTPAC Science Symposia)

NEAR-GOOS Databases

China

Japan (incl. Regional DB)

NRTDB

NDMDB

RRTDB

RDMDB

Rep. of Korea

Russia

NRTDB

NDMDB

NRTDB

NDMDB

Regional and National DBs

Country	Database	Responsible organization	URL
Japan	Regional RTDB	JMA	https://www.data.jma.go.jp/gmd/goos/data/database.html
	Regional DMDB	JODC	http://near-goos1.jodc.go.jp
China	National RTDB	NMEFC	http://neargoos.nmefc.cn:8080/exchange/index.jsp
	National DMDB	NMDIS	http://near-goos.nmdis.org.cn
Korea	National RTDB	KHOA	http://www.khoa.go.kr/neargoos/
	National DMDB	NIFS	http://www.nifs.go.kr/kodc/eng/01_about/02.jsp
Russia	National RTDB	FERHRI	http://ferhri.org/en/our-projects/near-goos.html
	National DMDB	POI	http://pacificinfo.ru/near-goos/

- Now 8 DBs work well.

MBON

Marine Biodiversity
Observation Network



Frank Muller-Karger
University of South
Florida



Isabel Sousa-Pinto
University of Porto



Mark Costello
University of Auckland

1. Developing an MBON Implementation Plan
2. Data Management
3. Developing EBVs



The Global Ocean Observing System



[Click on each EOVS for their respective spec sheets]

PHYSICS		BIOGEOCHEMISTRY	BIOLOGY AND ECOSYSTEMS
Sea state	Oxygen		Phytoplankton biomass and diversity
Ocean surface stress	Nutrients		Zooplankton biomass and diversity
Sea ice	Inorganic carbon		Fish abundance and distribution
Sea surface height	Transient tracers		Marine turtles, birds, mammals abundance and distribution
Sea surface temperature	Particulate matter		Hard coral cover and composition
Subsurface temperature	Nitrous oxide		Seagrass cover
Surface currents	Stable carbon isotopes		Macroalgal canopy cover
Subsurface currents	Dissolved organic carbon		Mangrove cover
Sea surface salinity	Ocean colour (<i>Spec Sheet under development</i>)		Microbe biomass and diversity (*emerging)
Subsurface salinity			Benthic invertebrate abundance and distribution (*emerging)
Ocean surface heat flux			

MBON Vision

MBON is a “coalition of the willing” who agree to share knowledge and know-how to evaluate changes of biodiversity in the ocean, including data, products, protocols and methods, data systems and software.

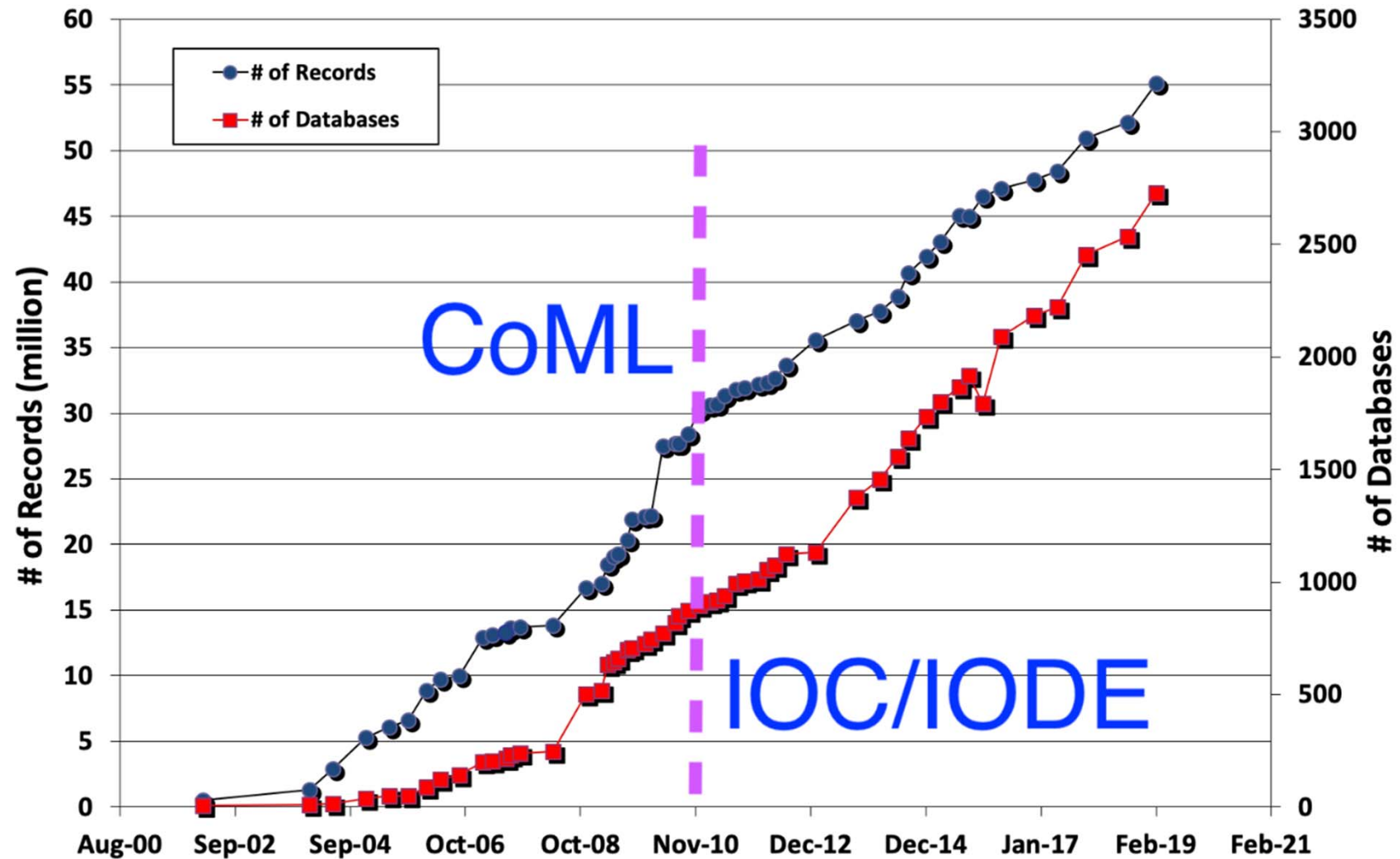
The MBON seeks to establish a process for sustained, operational measurements of biodiversity around the globe. These observations should be collected in standardized ways, and the information shared, in order to understand how biodiversity is changing.

The ultimate objective is to understand how and why life in the ocean is changing, how local changes relate to changes taking place over larger regions, and to provide information to help define options for government and intergovernmental policies relevant to the conservation and sustainable use of marine biodiversity.

KEY OBJECTIVES

- **Develop an implementation plan** that leads and coordinates institutions, organizations, existing networks, and people so as to build a community of practice to promote field, laboratory, statistical and reporting methods for the global community.
- **Networking with the biodiversity and marine science communities**, including within GEO, GEO BON, IOC, IABO, marine station networks, and national organizations;
- **Develop a common framework for Essential Biodiversity Variables (EBVs)** within GEO BON and GOOS Essential Ocean Variables (EOVs, developed jointly with the GOOS Bio-Eco panel);
- **Support work led by UNEP-WCMC on development of marine indicators** to support SDG 14 and Aichi Targets;
- **Foster the development of international and thematic MBON**, including development of marineGEO and expansion of USA MBON projects to an all-Americas MBON;
- **Promote best practice in data management**, including development of standards that aid interoperability and data integration, and publication of data through OBIS; including contributing to the GEO BON “BON in a Box” compendium of methodologies for biodiversity observations;
- **Support research that supports the development of MBON.**

Success data publication



MBON

Marine Biodiversity
Observation Network

- The [U.S. MBON projects](#) are integrating independent historical and current biology and ecosystem surveys with new observations, and expanding application of remote sensing methods, novel molecular (eDNA) technologies, traditional environmental research tools, and coordinated experiments.

U.S. MBON Contacts

[Gabrielle Canonico](#), U.S. MBON Program Manager

[Frank Muller-Karger](#), U.S. MBON Team Leader

[Enrique Montes](#), MBON Pole to Pole



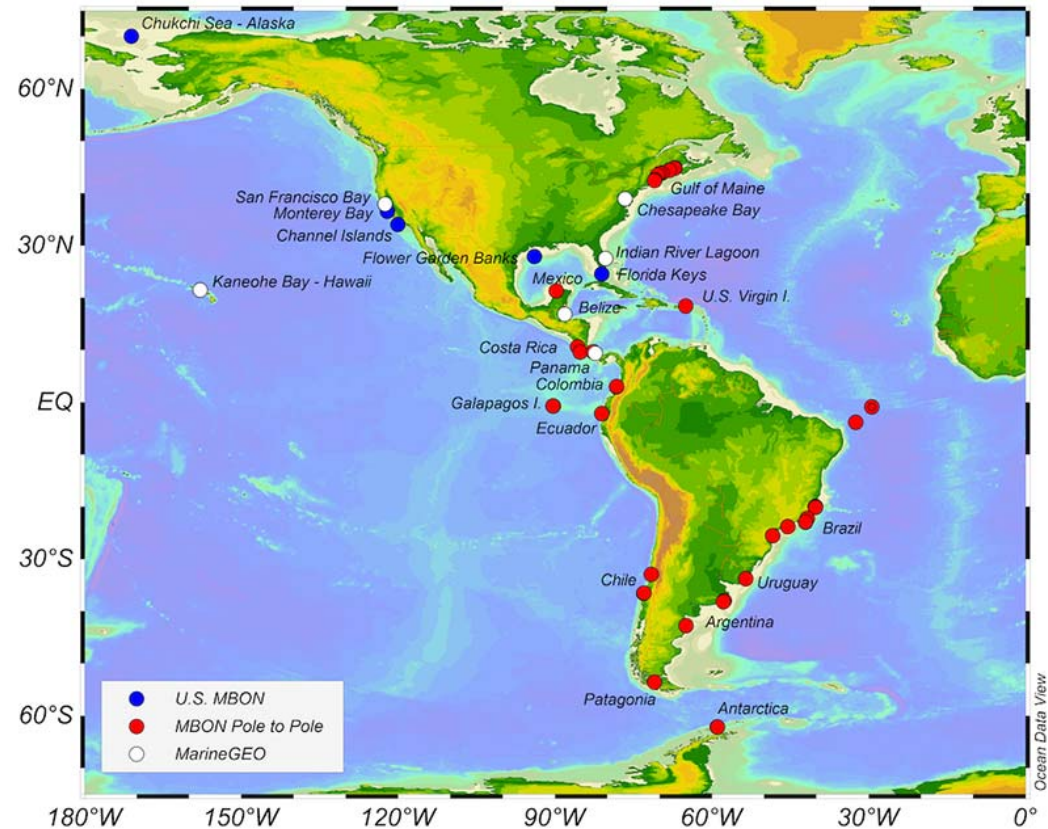
Sponsors

U.S. MBON projects have been funded since 2013 under the National Oceanographic Partnership Program (FY14 RFP NOAA-NOS-IOOS-2014-2003803 and FY19 ONR Announcement # N00014-18-S-B007). U.S. MBON represents a partnership among NOAA, NASA, BOEM, and ONR, with coordination provided by the U.S. Integrated Ocean Observing System (U.S. IOOS) Program Office.

MBON Pole to Pole Project

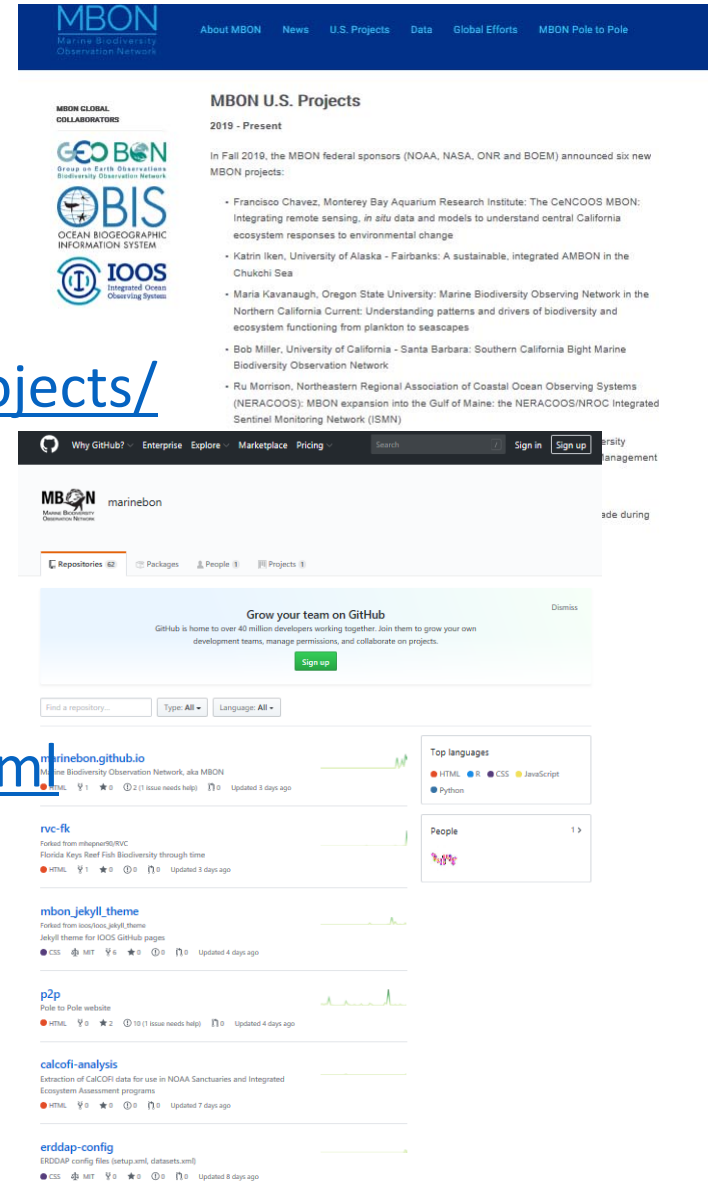
https://marinebon.org/pages/pole_to_pole/

- Members specialty (over 38)
 - Rocky shores
 - Sandy beaches
 - Environmental data
 - Data science
- Uploading to OBIS



Please see the website of MBON US project

- MBON
 - https://marinebon.org/pages/us_projects/
- MBON data portal
 - <https://mbon.ioos.us/>
- P2P
 - <https://marinebon.org/p2p/index.html>
- Data and website
 - <https://github.com/marinebon>



<https://mbon.ioos.us/>



Marine Biodiversity Observation Network

Catalog Map 0


All 34,850 Sensor Stations 33,547 Data Layers 767 Project data 19 More Advanced

Add to map + Downloads

Florida Artificial Reefs

Artificial Reefs of Florida


Florida has one of the most active artificial reef programs among the 14 Gulf and Atlantic coastal states involved in artificial reef development. The Florida artificial reef program is the only state program that is not exclusively run at a state agency level where the state holds all the reef area permits. Because of the extent of coastline and statewide involvement in reef activities, the FWC program continues a cooperative partnership with...

Add to map + Downloads

Atlas Study Area

Atlas Study Area


This layer contains information on the spatial extent of the project area

Add to map + Downloads

Bird Survey Effort

Bird Survey Effort (Number of Surveys at Location)

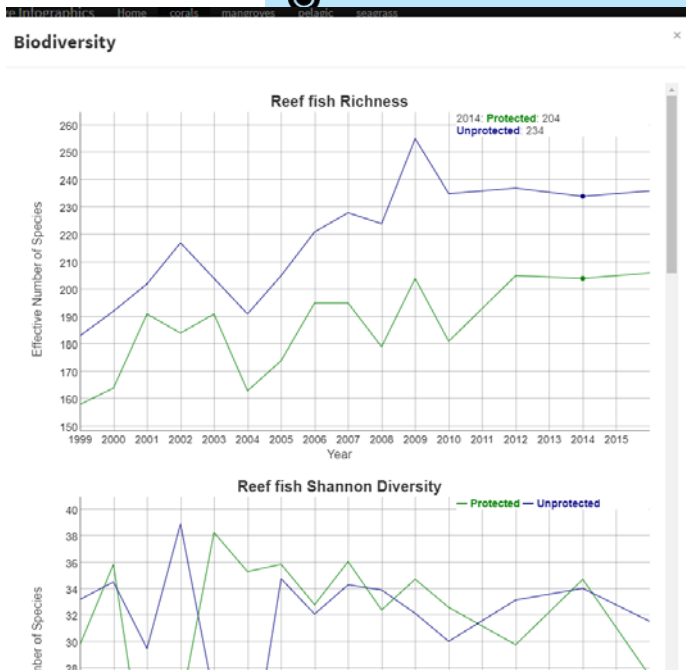
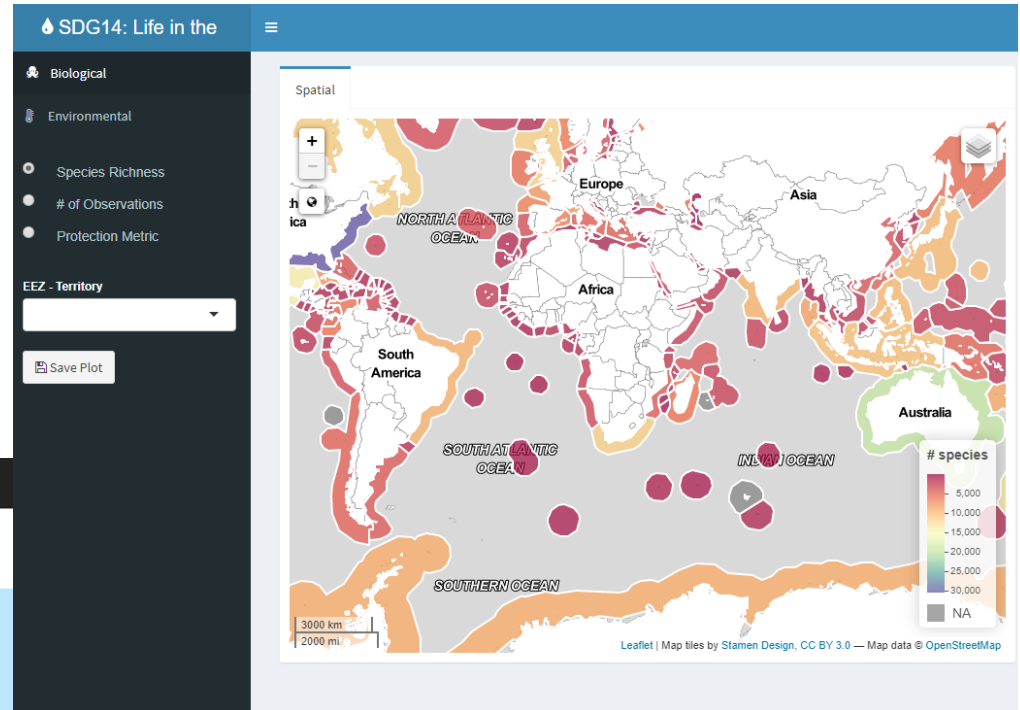
This dataset includes information on avian survey effort within the project area generated from Audubon Alaska's Geospatial Bird Database (AGBD, Audubon Alaska 2016), which combines and integrates data from available aerial and at-sea bird surveys conducted by the US Fish and Wildlife Service (USFWS), the National Park Service (NPS), and the Program for Regional and International Shorebird Monitoring (PRISM), as well as data from the North Pac...



<http://mbon.marine.usf.edu/>

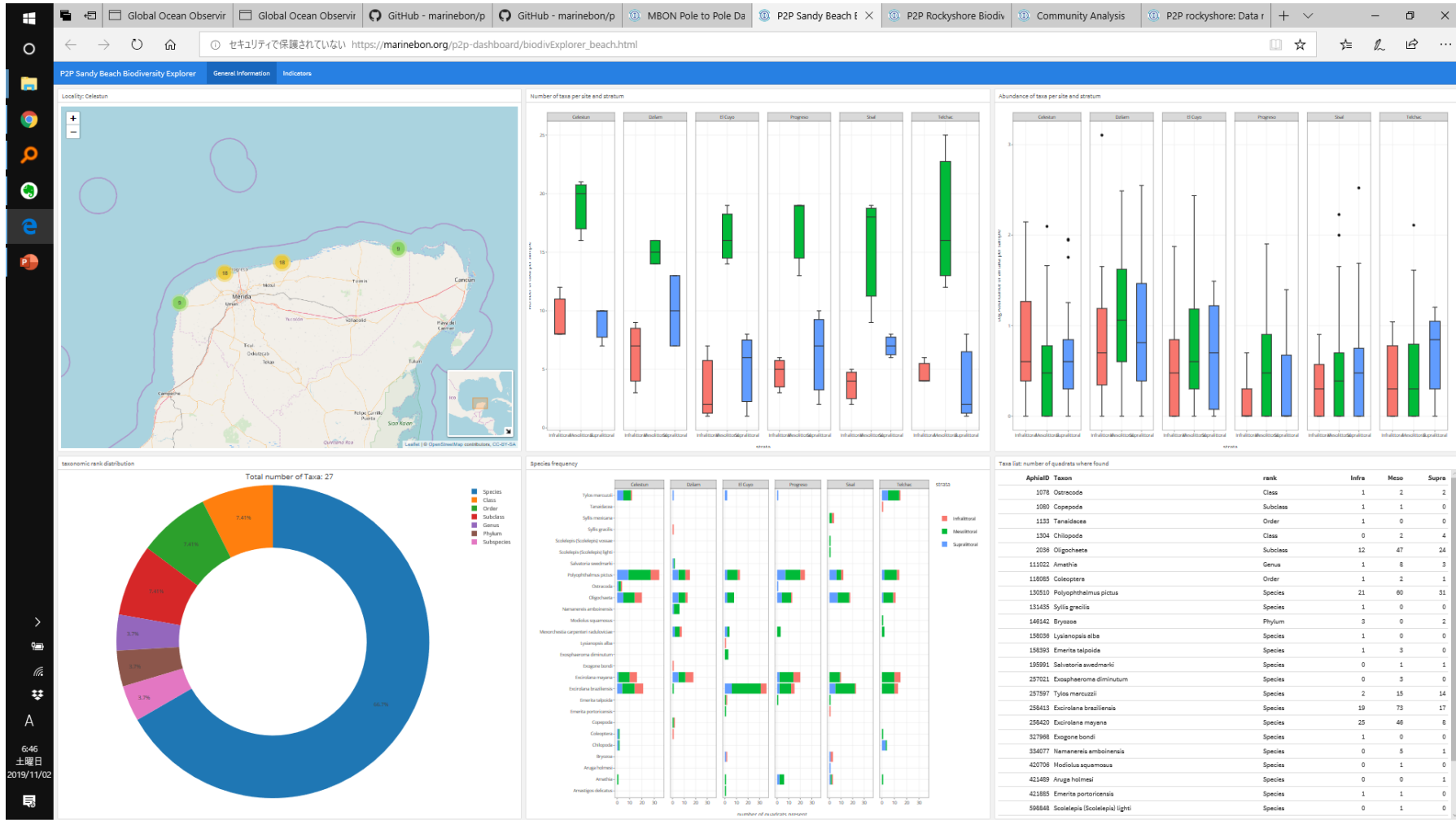
MBON Interactive Infographics Home corals mangroves pelagic seagrass

corals



- group)
- Black Sea Urchin (keystone)
- Exploited Reef Fish (focal)
- Forage Fish (trophic group)
- Grouper-Snapper Complex (trophic group)
- Grunt (trophic group)
- Jacks (trophic group)
- Lionfish (invasive)
- Macroalgae
- Parrotfish (trophic group)
- Queen Conch (focal)
- Rays (trophic group)
- Sharks (trophic group)
- Soft Corals (foundation)
- Sponges
- Stony Corals (foundation)
- Trophic Level Pyramid
- Zoanthids
- Sea Surface Temperature

<https://marinebon.org/p2p-dashboard/>



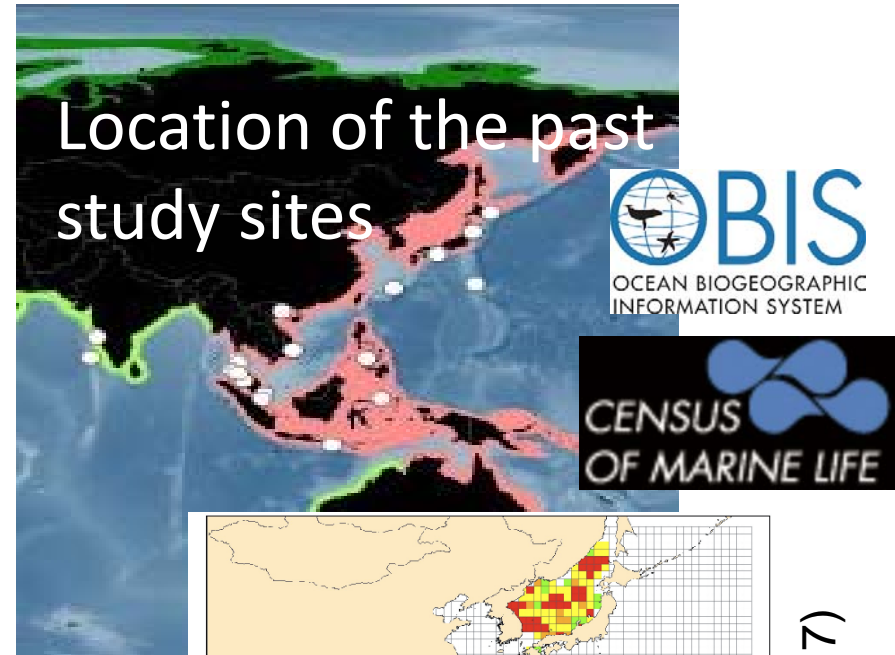
Project : Coastal biodiversity assessment

Revive past activities to observe
temporal changes
Over 10 years
since CoML...

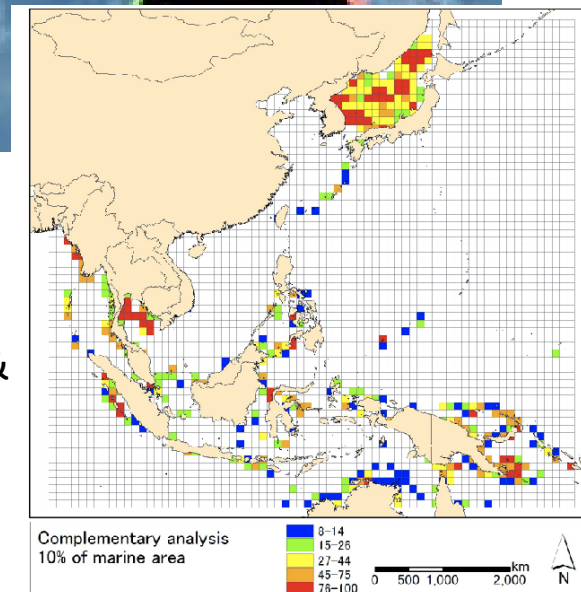
- temporal change?
- improve of the technique
(such as DNA & Camera)
- Pole to Pole
biodiversity pattern

Use of the information
such as

- ecosystem services
- EBSA
- indicator of the threat



Proposed
EBSA
using
existing &
literature
extracted
data



Yamakita et al. (2017)
Marine Policy

Project : Coastal biodiversity assessment

Facilitate broad scale researches and production of infrastructure

Present data...

- Some are still not good enough
- Some need temporal data

Ways to improve

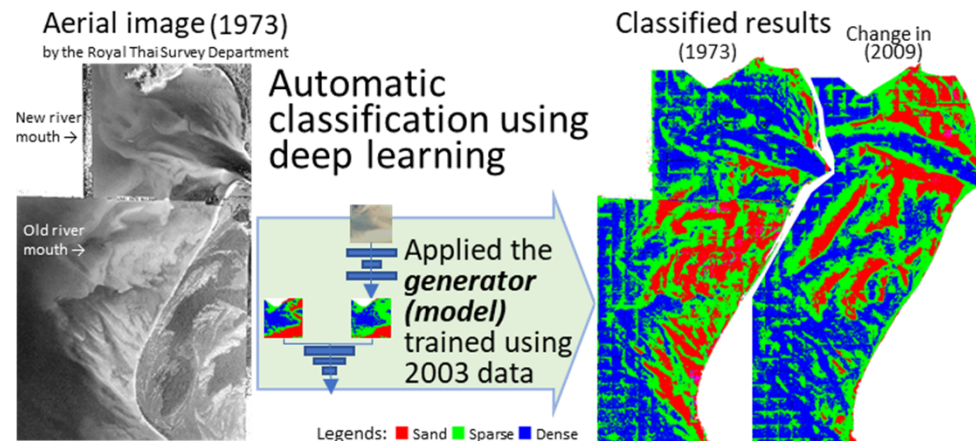
- image recognition
- eDNA
- survey using drone
- literature

... etc

- Update the maps of seagrasses, algae and coral reefs & build GIS database



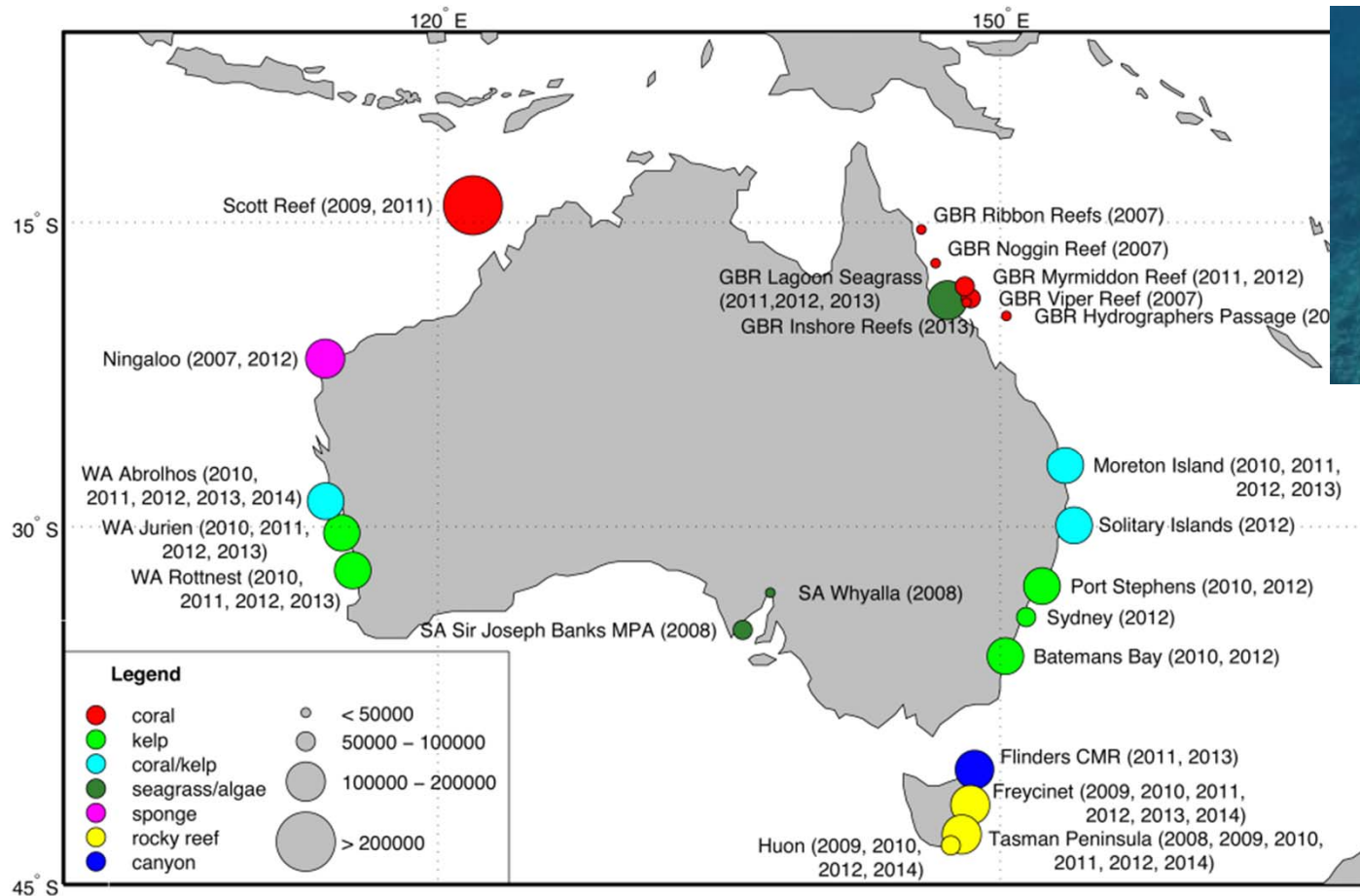
Coral reef habitat data in AP region using ALOS/AVNIR2 (National Institute for Environment Studies (NIES) and Asia Air Survey Co.,Ltd)



More accurate classification of seagrass Yamakita et al. 2019 Bot Mar

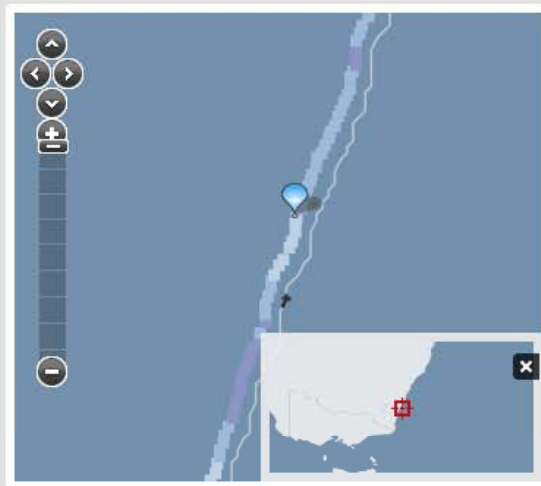
Topics in AO: What's happening in the Australia monitoring...marine Drone?

- <http://marine.acfr.usyd.edu.au/fieldwork/imos-auv-facility/>
- <https://www.sims.org.au/page/93/autonomous-underwater-vehicle>



<https://auv.aodn.org.au/auv/>

Autonomous Underwater Vehicle Images Viewer



5 m
10 ft

Legend Lon: 150.43874
Lat: -35.53251



Site1sz 16 Densegrids3

Please try again or zoom in. Nothing found at that click point

Current Viewing Images: 2 to 3 of: 3 near your click point



IMOS is a national collaborative research infrastructure, supported by Australian Government. It is operated by a consortium of institutions as an unincorporated joint venture, with the [University of Tasmania](#) as Lead Agent.

[Acknowledgement](#) | [Disclaimer](#)

<https://www.nespmarine.edu.au/>

<https://research.science.mq.edu.au/capstan/wp-content/uploads/sites/18/2016/01/NMSP-2015-2025-report.pdf>

<https://soe.environment.gov.au/theme/marine-environment/topic/2016/state-and-trends-marine-biodiversity-species-groups>



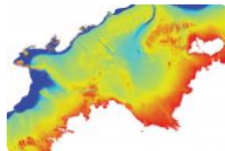
NESP Marine Biodiversity Hub

Research for understanding and managing Australia's marine biodiversity.

Research themes



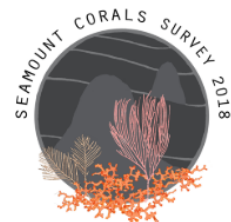
Threatened and migratory species



Supporting management decision making



Understanding pressures on the marine environment



BLOGGING THE SEAMOUNTS

Enter Keywords

Advanced Search

Quick links

Calendar of Events

National Marine Science | Plan Driving the development of Australia's blue economy 2015–2025

