AO GEO

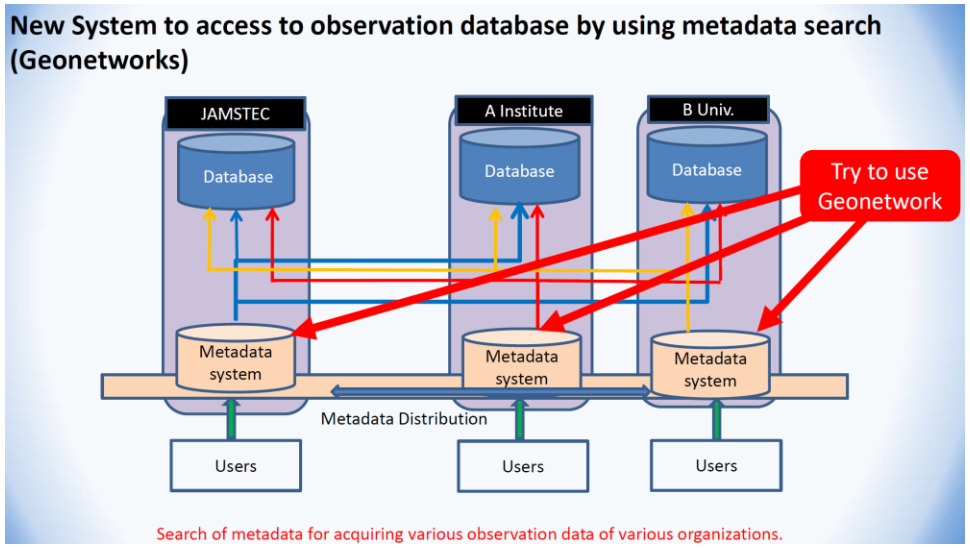
Earth Observations for Asia-Oceania

Task Group – 4: Oceans, Coasts, Islands (OCI)

Activity report

Genki Terauchi, *Northwest Pacific Region Environmental Cooperation Center*
Aletta Yniguez, *University of the Philippines*
Eko Siswanto, *Japan Agency for Marine-Earth Science and Technology*
Jonson Lumban-Gaol, *IPB University*
Anukul Buranaprathepprat, *Burapha University*
Sam Wouthuyzen, *National Research and Innovation Agency*
Nurul Hazrina Idris, *Universiti Teknologi Malaysia*
Aidy M Muslin, *Universiti Malaysia Terengganu*
Jutarak Luang-on, *Japan Agency for Marine-Earth Science and Technology*
Salem Ibrahim Salem, *Kyoto University of Advanced Science*
Victor Kuwahara, *Soka University*

TG4 pre-2025 achievements:
Data Inventory System (Geonetwork) enables access metadata from in situ observation database

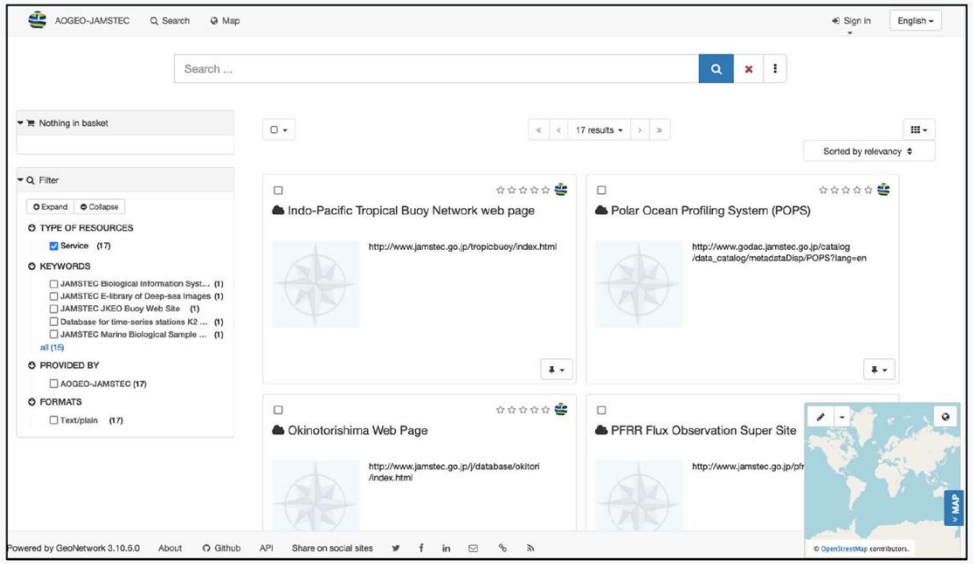


Australia IMOS: https://portal.aodn.org.au/
CSIRO: https://research.csiro.au/ncmi-idc/
Japan JAMSTEC Argo: (not available now, due to security issue in JAMSTEC)
JAMSTEC data base: http://www.jamstec.go.jp/e/database (not available)
Indonesia LIPI: http://pusdata.oseanografi.lipi.go.id/
http://gis.oseanografi.lipi.go.id/
Malaysia UMT: https://www.mynodc.gov.my/
Thailand GISDA: http://marinegiscenter.dmcr.go.th
OFS: http://ofs.dmcr.go.th/thailand/
Viet Nam IO: http://vodc.vnio.org.vn/

NEARGOOS: https://ds.data.jma.go.jp/gmd/goos/data/rrtdb/in-situ.html

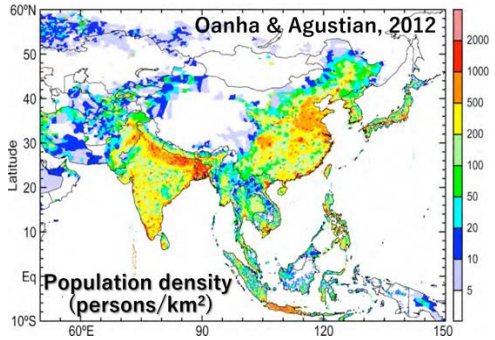
Demonstration site on Amazon Web Service (AWS)

http://3.112.1.116:8080/geonetwork/ on AWS

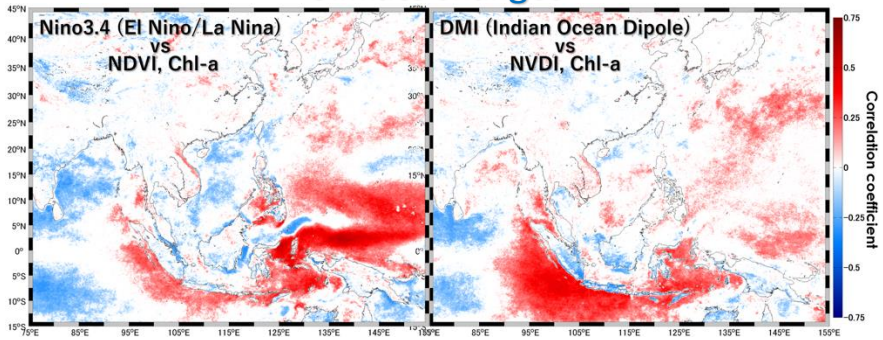


Threats and Environmental Issues in Asian Coastal Oceans

Human activities

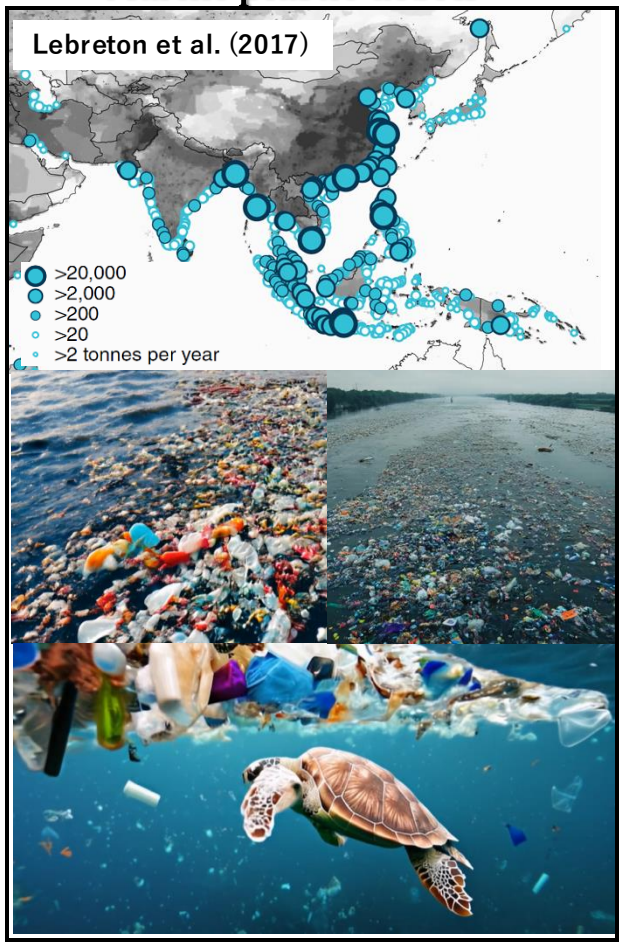


Climate changes

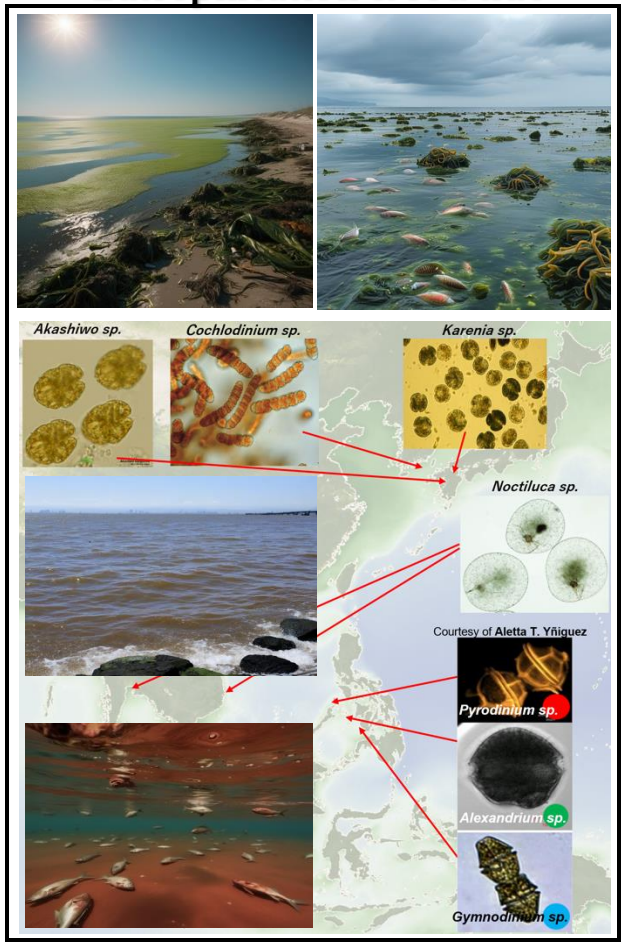


Global warming

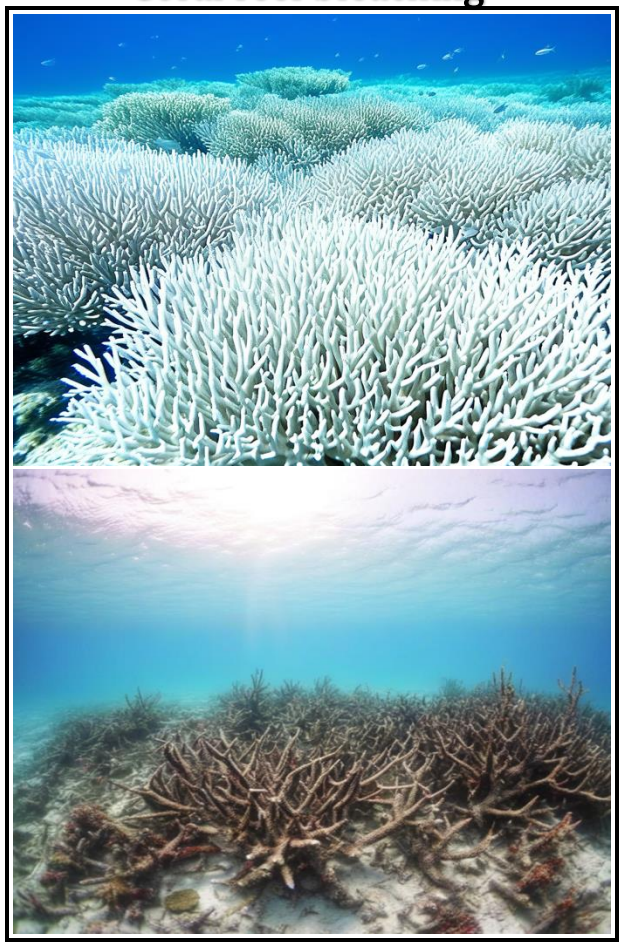
Marine plastic debris



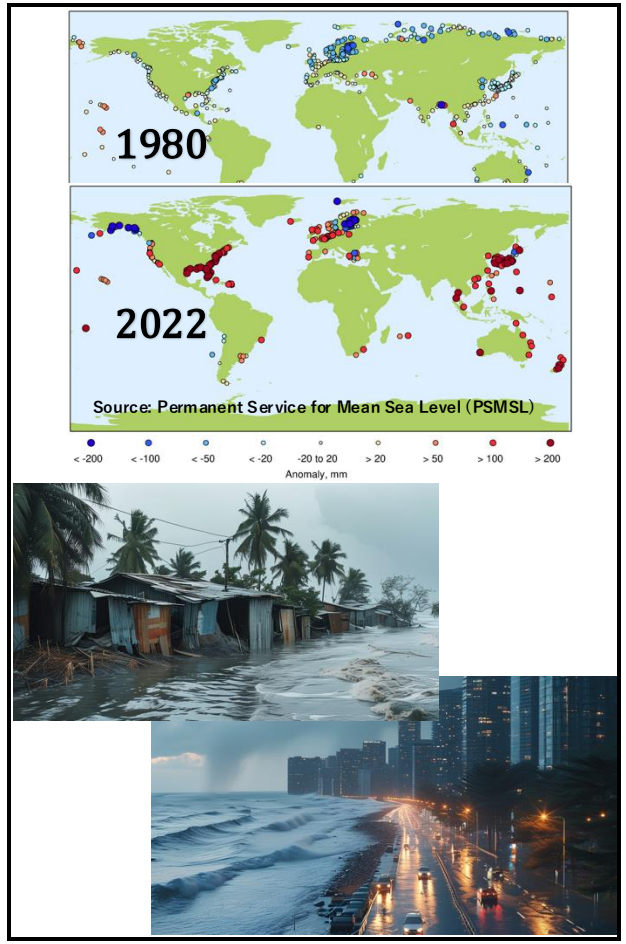
Eutrophication & red tide



Coral reef bleaching



Sea level rise



TG4 Session with new members

Time	Presentation Titles	Speakers
Day-1, Sep 3, 15:40 – 18:40, Moderator: Eko Siswanto		
15:40 – 16:00	Welcome remarks & Introduction to Task Group 4 Session	Aidy M. Shawal bin M. Muslim & Eko Siswanto
16:00 – 16:20	Understanding and managing harmful algal blooms in the Philippines	Aletta T. Yñiguez
16:20 – 16:40	Monitoring coastal ocean ecosystem climate change using GCOM-C and in situ bio-optical observations	Victor Kuwahara
16:40 – 16:50	**Short break**	
16:50 – 17:10	Seamless detection of harmful algal blooms with machine learning and satellite imagery	Salem Ibrahim Salem
17:10 – 17:30	Satellite-based observation of red tides in the eutrophic coastal waters	Jutarak Luang-on
17:30 – 17:50	Potential of SGLI-derived chlorophyll-a as an index of coastal eutrophication	Genki Terauchi
17:50 – 18:10	**Discussion**	
Day-2, Sep 4, 10:00 – 13:00, Moderator: Aletta T. Yñiguez		
10:00 – 10:20	Converting satellite-derived remote sensing reflectance to optical water quality for the entire Asian waters	Eko Siswanto
10:20 – 10:40	Integration of ocean color remote sensing and ocean modeling for understanding and predicting changes in coastal marine ecosystems	Anukul Buranapratheprat
10:40 – 11:00	Modelling and forecasting the effects of increasing sea surface temperature on coral bleaching in the Indo-Pacific region	Aidy M. Shawal bin M. Muslim
11:00 – 11:20	**Short break**	
11:20 – 11:40	Satellite radar altimeters for observing the sea level over the marginal sea in Southeast Asia	Nurul Hazrina binti Idris
11:40 – 12:00	Earth observation data for operational fisheries oceanography	Jonson Lumban Gaol
12:00 – 12:30	**Discussion for Task Group 4 activity reports**	

- **Optical sensors**
  - * Eutrophication
  - * Harmful algal blooms
  - * Fisheries
  - * Water quality
- **Infrared sensor**
  - * Coral reef bleaching
  - * Fisheries
- **Altimeter**
  - * Sea level
- **Coupled numerical model-marine ecosystem model**
  - * Ocean surface current
  - * Harmful algal blooms
- **In situ observers**
  - * Harmful algal blooms
  - * Fisheries

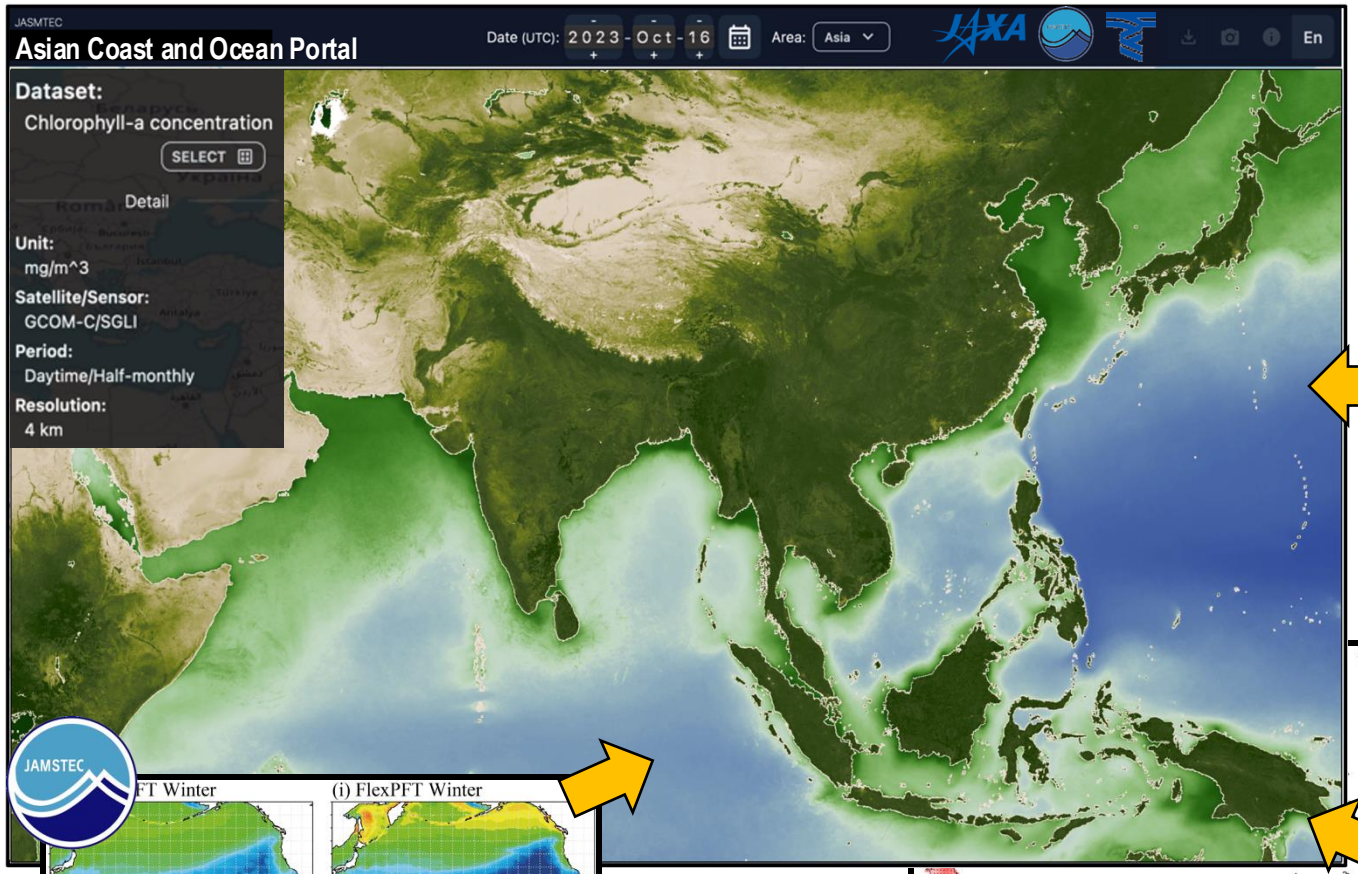
Asian Coast and Ocean Portal (A-COP)

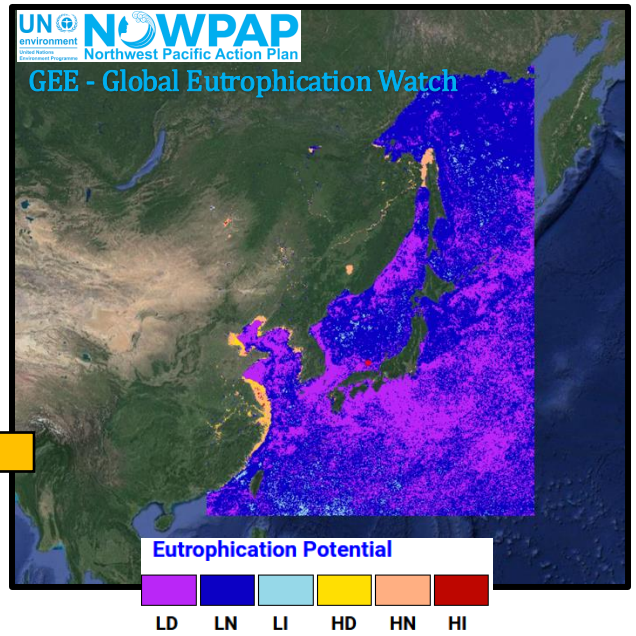
Products/maps

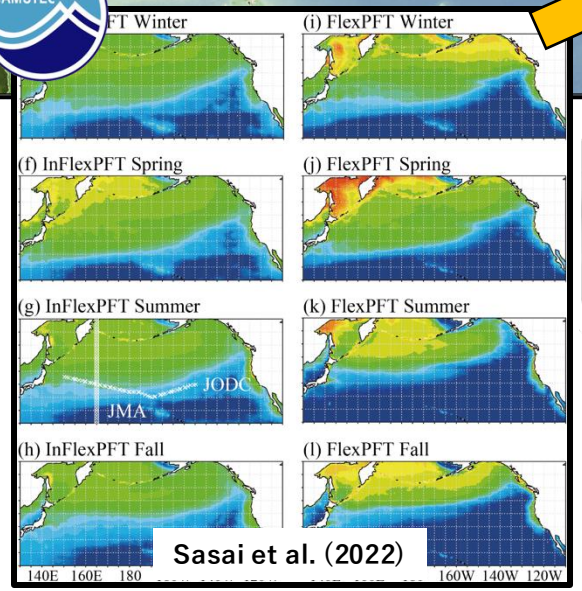
Optical/ocean color sensor
- Phytoplankton chlorophyll-a, CDOM, TSM
- Remote sensing reflectance (380 nm ~ 670 nm)
- Optically-based water quality
- Chlorophyll-a anomaly
- Red tide

Infrared sensor
- Sea surface temperature

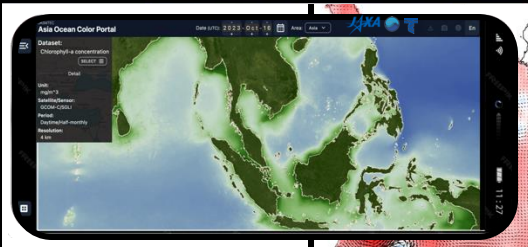
Other products/maps under consideration/discussion
- Eutrohication
- Bio-optical properties
- Phytoplankton functional types
- Net primary production (NPP)
- Sea leval anomaly/trend
- Surface ocean current
- Plastic debris
- Modeled chlorophyll-a / NPP
- Fisheries-related information
- etc.

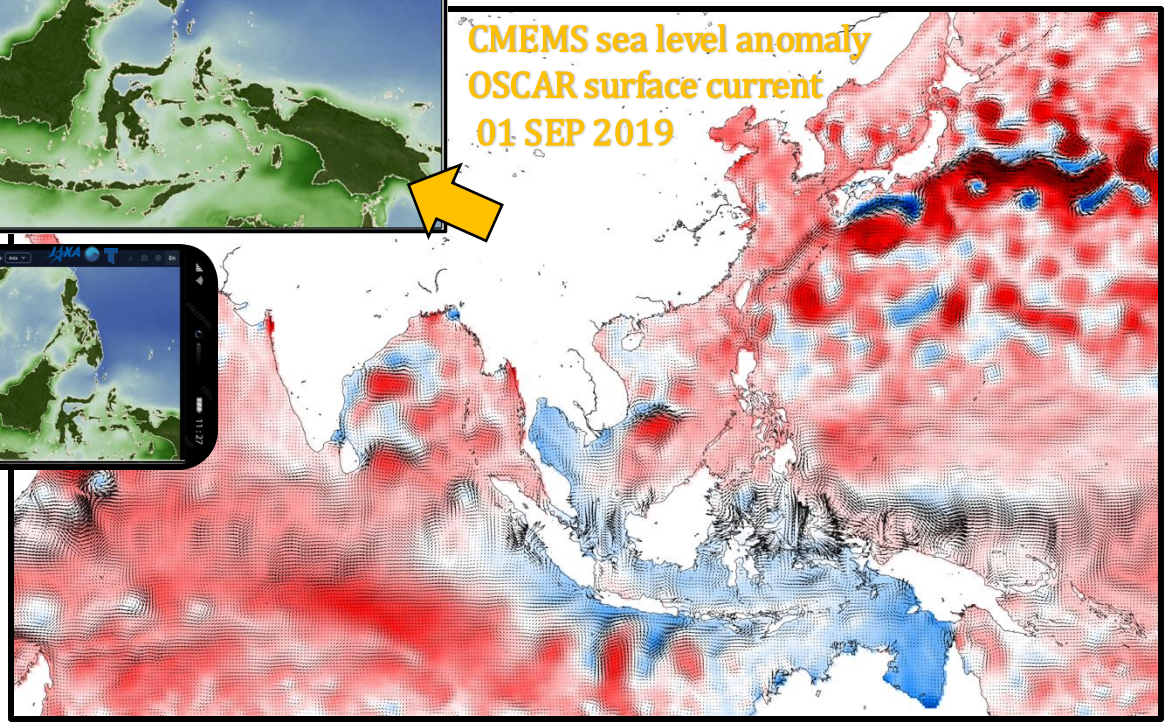


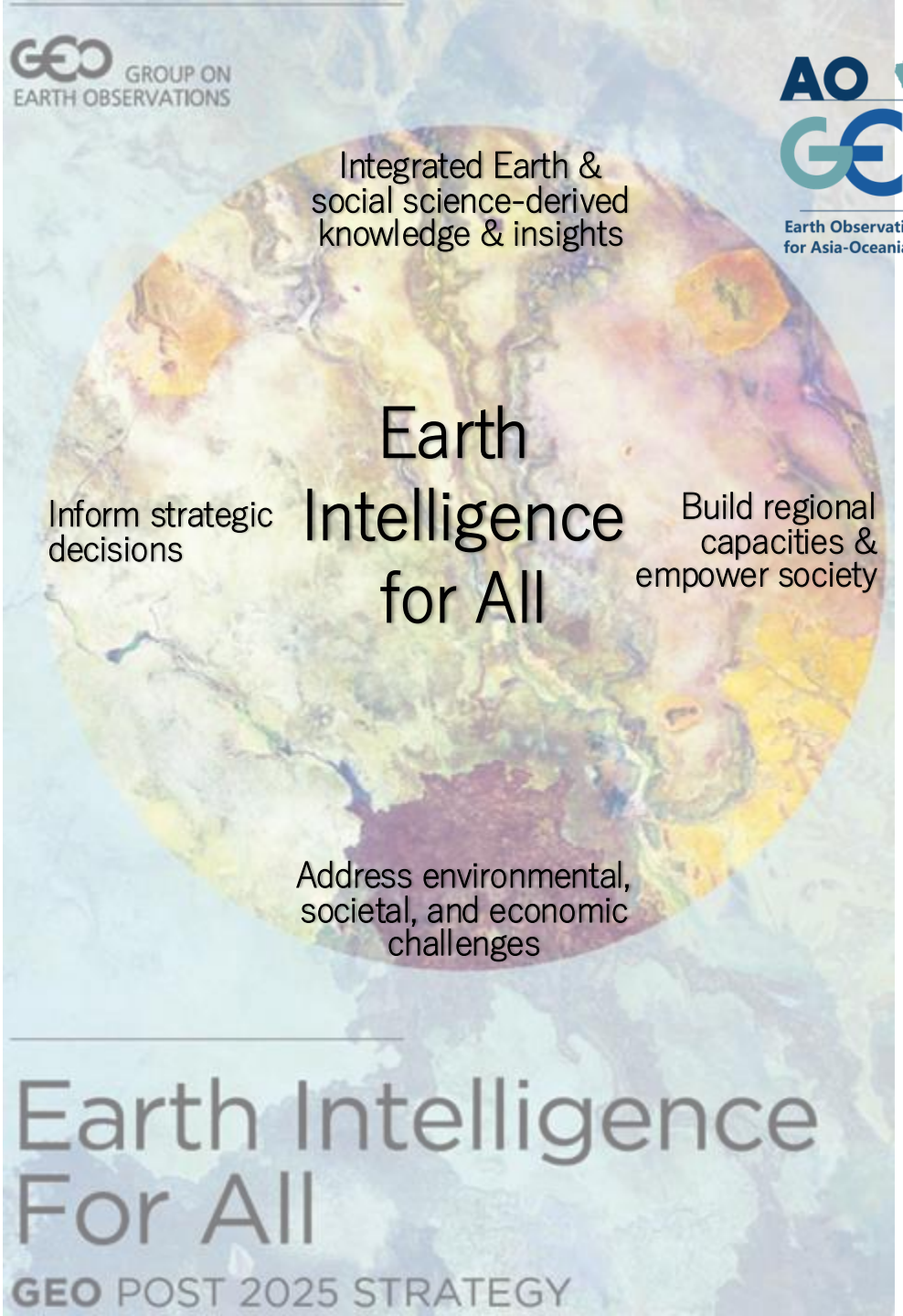




Sasai et al. (2022)







AO GEO
Earth Observations for Asia-Oceania

Objectives of the TG4 OCI Task

Harness Earth Observation (EO) to enhance coastal ocean environmental management by monitoring and assessing changes in key variables, informing evidence-based decision-making, and supporting Sustainable Development Goals (SDGs)

Strategies/Actions

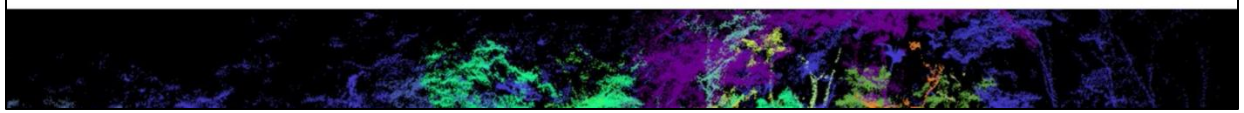
- Developing a portal to provide information mainly based on satellite observations (SGLI, Sentinel etc.)
- Promoting research collaborations (in situ data collections, algorithm and model developments, calibration/validation, etc.)
- Regional research capacity building (workshops, training, early-career scientist engagement, etc.)
- Linking with ongoing projects/programmes (e.g. Asia-Pacific Network for Global Change Research, CoastPredict) to strengthen the outputs/outcomes
- Promoting science-policy interfacing (e.g., UN Ocean Decade Action, stakeholder engagement)

Hiring early-career scientist

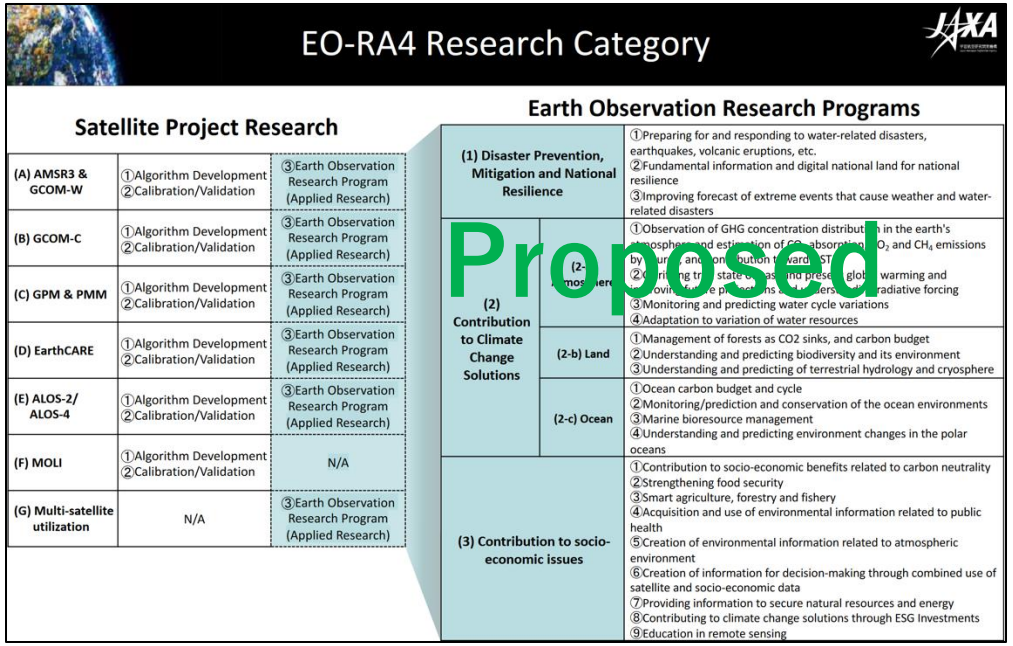
Digital biosphere
Integrated biospheric science for mitigating global environment change

Contact Us Japanese

Overview Member Achivement



Portal development



APN

Asia-Pacific Network for Global Change Research

APN Secretariat, East Building 4F, 1-5-2 Wakinohama Kaigan Dori, Chuo-ku, Kobe 651-0073, Japan.
Phone: +81-(0)78-230-8017 Fax: +81-(0)78-230-8018 Email: info@apn-gcr.org Website: www.apn-gcr.org

Portal development & in situ obs.

COLLABORATIVE REGIONAL RESEARCH PROGRAMME (CRRP)
AWARD LETTER

5 August 2024

Project Leader: Dr Eko Siswanto
Project Reference: CRRP2024-05MY-Siswanto
Project Title: Harnessing Earth Observation (EO) to Enhance Decision-Making for Eutrophication and Harmful Algal Bloom (EuHAB) Impact Mitigation and Adaptation

In situ observstions

MERF

Marine Environment and Resources Foundation, Inc.

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Velasquez St., U.P. Diliman,
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Telephone : (632) 3433 3645
Mobile : +63 920 681 5175
Website : www.merf.org.ph

BRIN
Indonesia National Research & Innovation Agency

lpdp
Indonesia Endowment Fund for Education

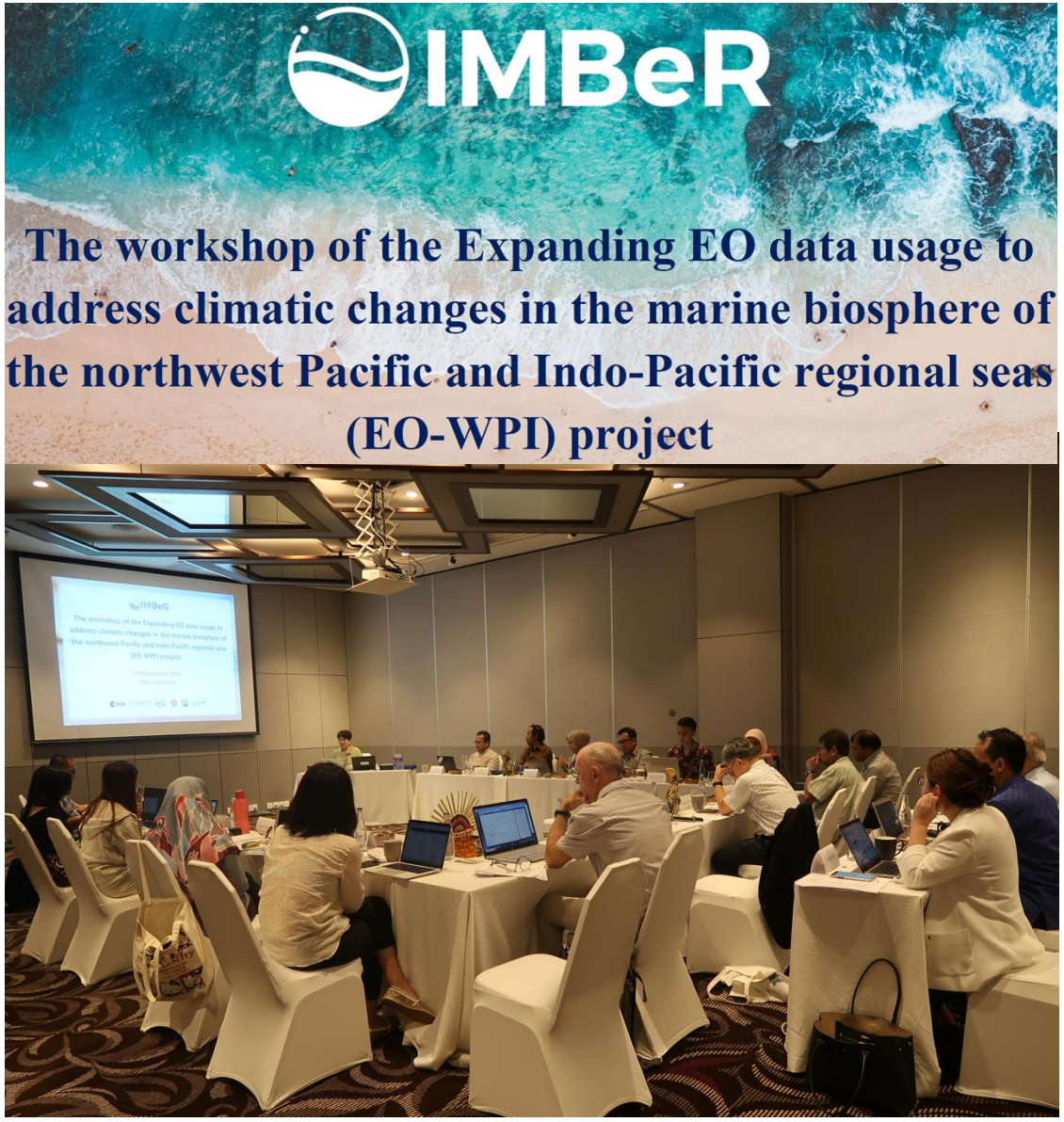
WPI TOHOKU UNIVERSITY & JAMSTEC AIMEC

wpi

Tohoku University & JAMSTEC
Advanced Institute for Marine Ecosystem Change (WPI-AIMEC)

Hiring early-career scientist

Improving regional research capacity in Earth Observation



Upcoming event

Current status & the way forward

- Task Group 4 (TG4) has redefined strategy to develop new Earth Observation-based platform, the Asian Coastal Ocean Portal (A-COP), aiming at providing data and information to the community to address environmental issues in Asian coastal oceans
- A-COP is currently in development phase. Initially, it will provide optical/ocean color products, with future plan to include other common biogeophysical variables. A-COP is expected to be launched within 2024
- Improving regional research capacity and early career scientist engagement
- The research and development of models/algorithms, along with A-COP improvement, and their implementation for socioeconomic benefits, will be the focus of the TG4's strategy post-2025