

## Project Endorsement Form

### 1. PROJECT TITLE

Full title	R/V Hakuho-Maru 2020 cruise
Acronym	Hakuho2020
Website	N/A
Keywords (up to 10, describing the project research)	Eastern Indian Ocean, Upwelling system, ocean dynamics, air-sea interactions, biogeochemical/ecological variations, Indonesian throughflow, meso/submeso-scale phenomena, biophysical interaction
New initiative or continuing programme?	The cruise itself is a new project, but this cruise is a follow-up of R/V Hakuho-Maru 2018 cruise and the research topics and objectives are basically the same.

### 2. APPLICANTS

#### Lead applicant / Project Leader / key research contact person:

First name	Yukio
Last name	Masumoto
Affiliation	Dept. of Earth and Planetary Science, The University of Tokyo
Postal address	Hongo 7-3-1, Bunkyo-ku, Tokyo, 113-0033, Japan
Country	Japan
Telephone	+81-3-5841-4297
Email address	masumoto@eps.s.u-tokyo.ac.jp
Institutional or personal website	<a href="http://www.eps.s.u-tokyo.ac.jp/index-en.html">http://www.eps.s.u-tokyo.ac.jp/index-en.html</a>

#### Other key participants / research team leaders: (repeat as needed)

First name	Hiroaki
Last name	Saito
Role in the project	Biological oceanography, Planktons
Affiliation	Atmosphere and Ocean Research Institute, The University of Tokyo
Country	Japan
Email address	hsaito@aori.u-tokyo.ac.jp
Institutional or personal website	<a href="https://www.aori.u-tokyo.ac.jp/english/index.html">https://www.aori.u-tokyo.ac.jp/english/index.html</a>

First name	Hajime
Last name	Obata
Role in the project	Chemical Oceanography, Trace Metals
Affiliation	Atmosphere and Ocean Research Institute, The University of Tokyo
Country	Japan
Email address	obata@aori.u-tokyo.ac.jp
Institutional or personal website	<a href="https://www.aori.u-tokyo.ac.jp/english/index.html">https://www.aori.u-tokyo.ac.jp/english/index.html</a>

First name	Iwao
Last name	Ueki
Role in the project	Ocean dynamics, Upwelling dynamics
Affiliation	Japan Agency for Marine-Earth Science and Technology
Country	Japan

### IIOE-2 Joint Project Office (JPO)

Email address	uekii@jamstec.go.jp
Institutional or personal website	<a href="http://www.jamstec.go.jp/rcgc/e/oairg/">http://www.jamstec.go.jp/rcgc/e/oairg/</a>

*N.B.: Please note that all these names and contact details will be added to the IIOE-2 membership database.*

### **3. ABSTRACT– Brief description of the project: (1/4 page maximum)**

*This will be placed on the IIOE-2 Website after endorsement.*

The current systems of the Eastern Indian Ocean show dynamic seasonal and interannual variations responding to seasonal monsoon and climate variability as well as climate regime shifts. The biogeochemical cycling and ecosystem of the Eastern Indian Ocean also change with physical oceanographic regime. Since the Eastern Indian Ocean is located at the most populated region of the world, the ecosystems there are also influenced by various anthropogenic perturbations such as pollutants, plastic debris, overfishing, etc. The Eastern Indian Ocean is, however, seriously understudied region relative to the Pacific Ocean and the Atlantic Ocean, due mainly to paucity of in situ observations, hence our knowledge on the physical, biological, and biogeochemical processes are limited. Understanding the mechanisms of biogeochemical cycle and ecosystem responses to natural and anthropogenic perturbations, as well as variability in physical conditions, is an emergent issue since increasing human activity is degrading the quality and quantity of marine ecosystem services, on which our society is dependent.

In order to tackle with the emergent issues, it is essential to take an interdisciplinary approach, under which physical oceanographers, biogeochemists, biological oceanographers, and atmospheric chemists work together to unveil physical-chemical-biological interactions in the Eastern Indian Ocean. This research cruise, using R/V Hakuho-Maru, provides one such opportunity and in situ data for better understanding of the above key issues.

### **4. LINKS TO IIOE-2 SCIENCE PLAN:(1/2 page maximum)**

How do you anticipate your project to contribute to the IIOE-2 strategy and science delivery, with reference to which (either one or more) of the six IIOE-2 Science Plan themes that your project responds. Please state the specific issues and questions addressed by your project in the context of the IIOE-2 Science Plan themes and key issues.

This cruise will contribute to IIOE-2 mainly through its science theme 2 (boundary current dynamics, upwelling variability and ecosystem impacts), theme 3 (monsoon variability and ecosystem response), theme 4 (circulation, climate variability and change), and theme 6 (unique geological, physical, biogeochemical, and ecological features of the IO), since understanding of physical and biogeochemical/ecological aspects in the eastern Indian Ocean is cross-cutting issue relevant to many important topics raised by the IIOE-2 Science Plan. We will participate as much as possible in conferences/symposiums/workshops of IIOE-2. The project leader will attend the IIOE-2 SC to report progresses of and scientific highlights obtained by the cruise.

### **5. REGION(S) OF STUDY**

#### **IIOE-2 Joint Project Office (JPO)**

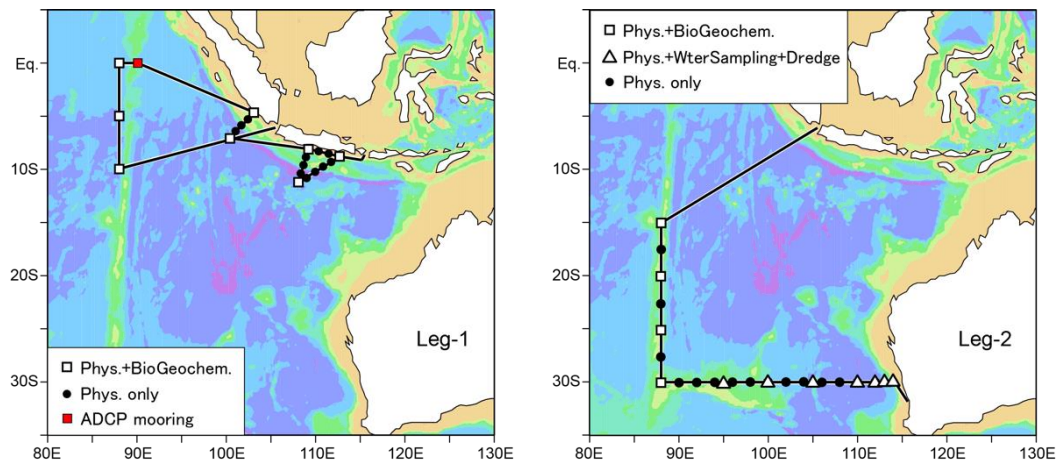
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Provide a description of ‘where’ the research is to be conducted (for field based activities) and/or the region or regions to which the research pertains (you are encouraged to consider providing a figure as an addendum to your proposal).

The target area of this cruise is the eastern Indian Ocean. There will be two legs in this cruise (Leg-1 and Leg-2). Leg-1 focuses on the upwelling system off the coast of Sumatra and Java, which we could not achieve during the R/V Hakuho-Maru 2018 cruise due to the EEZ permission issue. Leg-2 will observe a section along 88E from the equator down to 30S, which is a follow-on and extension of the R/V Hakuho 2018 cruise, and along 30S from 88E to the Australian coast, focusing on subduction region and meso-scale eddy structures. The following figures indicate the planned cruise tracks and locations of observation stations.



The planned cruise tracks of Leg-1 (left) and Leg-2 (right) of R/V Hakuho-Maru 2020 cruise.

## 6. TIMETABLE OF THE PROJECT

Start date:  
July, 2019

The cruise is planned for about 52 days from Aug.16, 2020 to Oct.6, 2020.

Before that period, preparations for the cruise will be done, including official procedures on the observations within the Indonesian and Australian EEZs. After the cruise, quality check and analyses of obtained data will be conducted.

End date:  
March, 2022

## 7. LINKAGES WITH OTHER PROJECTS / PROGRAMMES / INITIATIVES

Is the project part of a related national or multi-national activity?

If yes, provide the related activity title and website for reference, if available:

This research cruise is a part of EIOURI project, which is one of the IIOE-2 endorsed program. We also try to make a strong link to other programs/projects/cruises focusing on the eastern Indian Ocean, for example the Australian cruise using R/V Investigator along 110E.

Is your project part of, or affiliated to, another SCOR, IOC or IOGOOS activity or project?  
If “yes”, please indicate which activity or project:

No

## 8. DATA MANAGEMENT

1. Will new data be collected as part of this project (yes or no?)

Yes

2. Contact information if any, of the person in charge of the data management from whom the metadata can be accessed by interested IIOE-2 stakeholders.

*Please note that for all IIOE-2-endorsed projects, IIOE-2 will have developed its own metadata portal. Once the project is endorsed, the project leader will be asked to provide the metadata information of the project.*

Yukio Masumoto will manage data information, which will be collected during EIOURI.

Yukio Masumoto

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masumoto@eps.s.u-tokyo.ac.jp

## 9. FUNDING

*Please note that IIOE-2 strongly encourages funded/resourced projects. However, IIOE-2 may endorse projects yet to receive funding/resourcing if IIOE-2 endorsement can be clearly shown to significantly aid in prospects for funding/resourcing.*

Has funding and resources to successfully achieve and undertake the project been obtained? Indicate the sources of funding and resources that have been approached and/or secured.

R/V Hakuho-Marui ship-time was already assigned based on the application to Atmosphere and Ocean Research Institution, The University of Tokyo.

Associated scientific funding is partly secured from Japan Society for the Promotion of Science until March 2021. However, we will apply additional funding for research to continue analyses of the data.

## 10. BENEFITS FROM IIOE-2 ENDORSEMENT (1/4 page maximum)

Specify why you are seeking endorsement and how the activity would benefit from endorsement, and how the IIOE-2 SC could assist in the implementation of your project.

### IIOE-2 Joint Project Office (JPO)

The IIOE-2 endorsement to our planned Hakuho-Maru 2020 project would be very helpful and effective to appeal to a selection committee of research funding and to an evaluation committee on research ship utilization.

**11. OPTIONAL: OTHER COMMENTS/INFORMATION/MATERIAL** (*length and detail may be at the discretion of and as deemed necessary by the applicant*)

Please feel free to provide any other comments, information or materials that you feel relevant to your proposal for the IIOE-2 Steering Committee's information and benefit. You may provide this as general information or provide the additional comments/information/materials as relevant to any of the specific Sections above.

**IIOE-2 Joint Project Office (JPO)**