

## **2<sup>nd</sup> International Symposium “Ocean Mixing Processes: Impact on Biogeochemistry, Climate and Ecosystem”**

Date: November 4 (SUN), 2018

Venue: AORI Auditorium, Atmosphere and Ocean Research Institute, The University of Tokyo (Kashiwa Campus)

Access map: <http://www.aori.u-tokyo.ac.jp/english/access/index.html>

Campus map: <http://www.aori.u-tokyo.ac.jp/english/access/campusmap.html>

### **Background:**

Ocean diapycnal mixing is a fundamental physical process that regulates ocean vertical circulations of water, nutrients, carbon and heat; however, its distribution and generation mechanisms have not been known because of the difficulties of observations. In order to tackle this problem, a five-year project “Ocean Mixing Processes: Impact on Biogeochemistry, Climate and Ecosystem (OMIX)” was launched in Japan on 2015 under the funding framework of MEXT (Ministry of Education, Culture, Sports, Science and Technology, Japan) Grant-in-Aid for Scientific Research in Innovative Areas. This research project is developing efficient observing systems of ocean diapycnal mixing and next-generation numerical models, those of which are able to quantify the maintenance mechanism of deep and bio-geochemical circulations and to reproduce observed bi-decadal ocean and climate variability. This new interdisciplinary study on ocean mixing opens the integrated sciences from physical, chemical, biological oceanography to climate and fisheries sciences.

### **Purpose:**

In this international symposium, leading scientists are invited from overseas to present OMIX related research activities especially focusing on the North Pacific and discuss with scientists joining OMIX regarding on their progress under OMIX and future collaborations. Posters are also to be presented by OMIX members on individual research topics. Find more about OMIX at <http://omix.aori.u-tokyo.ac.jp/en/>

### **Speakers:**

#### Invited

John Barth, Oregon State University

Annalisa Bracco, Georgia Institute of Technology

Kristen Davis, University of California

Yign Noh, Yonsei University

Bo Qiu, University of Hawaii

#### OMIX PIs

Ichiro Yasuda, The University of Tokyo  
Shuhei Masuda, Japan Agency for Marine-Earth Science and Technology  
Jun Nishioka, Hokkaido University  
Xinyu Guo, Ehime University  
Naomi Harada, Japan Agency for Marine-Earth Science and Technology  
Shin-ichi Ito, The University of Tokyo  
Toshiyuki Hibiya, The University of Tokyo  
Hiroyasu Hasumi, The University of Tokyo

**Primary Sponsors:**



Atmosphere and Ocean Research Institute (AORI),  
the University of Tokyo



Ocean Mixing Processes:  
Impact on Biogeochemistry, Climate and Ecosystem  
OMIX  
Grant-in-Aid for Scientific Research in Innovative Areas  
(MEXT)

**Accommodation:**

For invited speakers, we booked a room for you at Mitsui Garden Hotel Kashiwa-no-ha (check-in 3rd Nov. & check-out 5th Nov.):

<https://www.gardenhotels.co.jp/kashiwanoha/eng/>

All rooms reserved are single, non-smoking, including breakfast. If you accompany your family and want change the room style or schedule, please contact to secretary Ms. Rie Goda ([riegoda0130@ori.u-tokyo.ac.jp](mailto:riegoda0130@ori.u-tokyo.ac.jp)).

Mitsui Garden Hotel Kashiwa-no-ha locates nearby the Kashiwanoha Campus Station on TX (Tsukuba Express). The transportation from Yokohama to Kashiwanoha Campus Station is take JR to Akihabara and change to TX to Kashiwanoha Campus Station. It takes about 100 minutes.

On the way back to your country, the distance to Narita and Haneda Airport is almost same. However, there are frequent direct bus connection to Haneda Airport.

## **Program**

### *November 3 (Sat)*

**09:30 Meet at Yokohama and go together to Kashiwanoha (for invited speakers)**

**18:00 Welcome reception at Kashiwanoha (only applicants will participate)**

### *November 4 (Sun)*

**9:00—9:30 Registration and coffee**

#### **9:30—10:00 Opening**

Shin-ichi Ito (The University of Tokyo): Welcome and logistics

Ichiro Yasuda (The University of Tokyo): Introduction on the OMIX project

#### **10:00—11:40 Session 1 (Chair: Sachihiko Itoh)**

John Barth (Oregon State University): Transport and mixing across the inner shelf: An overview of the 2017 Point Sal, California, Inner Shelf Dynamics Experiment

Ichiro Yasuda (The University of Tokyo), Yasutaka Goto, Maki Nagasawa, Shinya Kouketsu and Toshiya Nakano: Development of CTD-attached fast-thermistor measurements method and preliminary results

Annalisa Bracco (Georgia Institute of Technology): Multiscale impacts of submesoscale flows

Satoshi Osafune (Japan Agency for Marine-Earth Science and Technology), Shuhei Masuda, Nozomi Sugiura, Toshimasa Doi, Tadashi Hemmi: Ocean state estimation by using observed mixing data

#### **11:40—13:00 Group Photo, Lunch**

#### **13:00—14:00 Poster (with coffee)**

#### **14:00—15:40 Session 2 (Chair: Toshiyuki Hibiya)**

Yign Noh (Yonsei University): Parameterization of Langmuir Circulation in the Ocean Mixed Layer Model Using LES and its Application to the Climate Model

Toshiyuki Hibiya (The University of Tokyo): Improvement of the parameterization of ocean mixing processes in the surface, deep, and bottom layers

Kristen Davis (University of California): Fate of internal waves on a shallow shelf (tentative title)

Takao Kawasaki (The University of Tokyo): Effect of remote tidal mixing on the Pacific meridional overturning circulation

#### **15:40—16:10 Break and Poster (with coffee)**

**16:10—17:50 Session 3 (Chair: Hiroyasu Hasumi)**

Bo Qiu (University of Hawaii): Dynamical Links between the Decadal Oyashio and Kuroshio Extension Variability

Takeshi Matsuno (Kyushu University), Eisuke Tsutsumi, Takahiro Endoh, Yiing-Jang Yang, Sen Jan, Xinyu Guo: Intensified vertical mixing in the Kuroshio downstream of I-lan ridge east of Taiwan

Maki Aita Noguchi (Japan Agency for Marine-Earth Science and Technology): Modelling elucidates impacts of atmospheric and riverine nitrogen inputs on marine biogeochemistry

Shin-ichi Ito (The University of Tokyo): Challenges on elucidation of climate variability impacts on living marine resources and new findings

**17:50—18:00 Closing Remarks**

Ichiro Yasuda (The University of Tokyo)

**18:30—20:30 Night Session**

**Poster**

P01 Toshiya **Nakano**, Daisuke Sasano, Takahiro Kitagawa<sup>1</sup>, Naoki Nagai<sup>1</sup>, Yoshiteru Kitamura<sup>1</sup>, Michio Aoyama, and Masao Ishii  
Recent deoxygenation in the Japan Sea Proper Water in the northeastern Japan Basin

P02 Shinya **Kouketsu**, Satoshi Osafune, and Toshimasa Doi  
Estimation of oxygen utilization rate with vertical diffusivity distributions inferred from salinity budgets

P03 Toshimasa **Doi**, Satoshi Osafune, Shuhei Masuda and Nozomi Sugiura  
Representation of multi-decadal changes in dissolved inorganic substances in the Estimated Ocean State for Climate Research (ESTOC) which included the estimation of iron limitation

P04 Hung Wei **Chou**, Humio Mitsudera, Kaihe Yamazaki, Hatsumi Nishikawa  
Dynamic of Barotropic Water Exchange between the Sea of Okhotsk and Pacific through tidal effects

- P05 Taiga **Honma**, Toru Kobari, Takeru Kanayama, Fukutaro Karu, Naoki Yoshie, Daisuke Hasegawa, Ayako Nishina, Hirohiko Nakamura  
Response of plankton standing stocks and productivity to turbulent nitrate flux in the Kuroshio across the Tokara Strait
- P06 Tetsuichi **Fujiki**, Minoru Kitamura, Shigeki Hosoda, Naomi Harada, Masahide Wakita and Yoshihisa Mino  
Influence of physical and chemical processes on phytoplankton community in the western subarctic Pacific
- P07 Yoshihisa **Mino**, Chiho Sukigara, Makio C. Honda, Hajime Kawakami, Tetsuichi Fujiki, Minoru Kitamura, Naomi Harada and Masahide Wakita  
Seasonal and interannual variations in the upper layer nitrogen availability and particles export in the western subtropical North Pacific
- P08 Hiroaki **Tatebe**, Yuki Tanaka, Yoshiki Komuro and Hiroyasu Hasumi  
Impact of deep ocean mixing on the climatic mean state in the Southern Ocean
- P09 Tomihiko **Higuchi**, Toyoho Ishimura, Yasuhiro Kamimura, Kotaro Shirai, Hana Shindo, Kozue Nishida, Kosei Komatsu and Shin-ichi Ito  
Otolith oxygen isotope analysis and temperature history in early life stages of the chub mackerel *Scomber japonicas*
- P10 Takaaki **Yokoi**, Yoshimasa Matsumura, Shin-ichi Ito, Raphael Dussin and Enrique Curchitser  
Application of The Modified ROMS-NEMURO.FISH for understanding growth and migration processes of particular fish species the Western North Pacific
- P11 Chenying **Guo** and Shin-ichi Ito  
Evaluating the effects of environmental conditions on the growth and migration of Pacific chub mackerel *Scomber japonicus*
- P12 Megumi **Enomoto**, Shin-ichi Ito, Motomitsu Takahashi, Chiyuki Sassa, Tomihiko Higuchi and Kotaro Shirai  
Habitat layer change timing of Japanese jack mackerel (*Trachurus japonicus*) estimated by stable oxygen isotope ratios in fish otoliths
- P13 Akira **Kuwata**, Hiroshi Kuroda, Tsuyoshi Watanabe, Kazuaki Tadokoro and Jun Nishioka.

Mechanism of spring bloom of diatoms in the Oyashio region

- P14 Hitomi **Oyaizu**, Shin-ichi Ito and Sachihiko Itoh  
Modeling growth and migration processes of immature Pacific saury (*Cololabis saira*) using an individual-based, bioenergetics-migration model
- P15 Yohei **Onuki** and Toshiyuki Hibiya  
Decay rates of internal tides estimated by an improved wave-wave interaction analysis
- P16 Michio **Watanabe**, Hiroaki Tatebe, Tatsuo Suzuki, and Kaoru Tachiiri  
Impact of deep ocean mixing on transient climate response and steric sea level rise
- P17 Hatsumi **Nishikawa**, Humio MITSUDERA, Takuya NAKANOWATARI, Tomohiro NAKAMURA, Keisuke UCHIMOTO, Hiroyasu HASUMI  
High-resolution modeling of nutrient transport in the northwestern North Pacific
- P18 Elígio de Raús Maúre  
Triggers of the Spring Bloom Initiation in Mesoscale Eddies Revealed by One-Dimensional Turbulence-Ecosystem Model
- P19 Takuya Hara  
Study on the circulation process of neodymium in seawater in the North Pacific Ocean, the Bering Sea and the Chukchi Sea
- P20 Kazuki **Ogi**, Naoki Yoshie, Anri Kabe, Eisuke Tsutsumi, Toru Kobari, Takeru Kanayama, Fukutaro Karu, and Taiga Honma  
Effects of nutrient enrichment on lower-trophic level ecosystem in the Tokara Strait

**Local Organization Committee:**

- Shin-ichi Ito (AORI, the Univ. of Tokyo)  
Sachihiko Itoh (AORI, the Univ. of Tokyo)  
Ayuko Sakata (AORI, the Univ. of Tokyo)  
Rie Goda (AORI, the Univ. of Tokyo)  
Naomi Kobayashi (AORI, the Univ. of Tokyo)