3rd International Symposium "Ocean Mixing Processes: Impact on Biogeochemistry, Climate and Ecosystem"

Date: May 23 and 24, 2019
Venue: Sanjo Conference Hall, The University of Tokyo (Hongo Campus)

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 will develop efficient observing system 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 two-day workshop, the PIs of 8 core research groups of OMIX are to report their progress during 4 years. Leading scientists are invited from overseas to present related research activities and comment on the progress and direction of OMIX. Posters are also to be presented by OMIX members on individual research topics.

Learn more about OMIX at http://omix.aori.u-tokyo.ac.jp/en/

WiFi-SSID: WINAS_WiFi PW: winaswifi
No drink No eat in the conference room (only plastic bottle OK; Vending Machine: 1F)
Lunch: B1F: KADOYA http://www.kadoya-taimeshi.com/kadoyamanage/shoplist/kadoyasanjotei/#lg=1&slide=0
1F: CREDO: http://www.kadoya-taimeshi.com/kadoyamanage/shoplist/tloungecredo/#lg=1&slide=0

Program:

May 23 (Thu.)

9:30—10:00 Registration and coffee (put up posters)

10:00—10:30 Opening
Ichiro Yasuda (The University of Tokyo): Introduction to the OMIX project and logistics

10:30—12:30 Session 1 (Chair: host who introduces each invited speaker)

Eric Kunze (Northwest Research Associates): Internal-wave-driven dissipation, mixing and the meridional overturning circulation in the Pacific (invited)

Sylvia T. Cole (Woods Hole Oceanographic Institution): An update on eddy diffusivity from Argo observations and insights into vertical mixing (invited)

Ren-Chieh Lien (University of Washington): Storm-Driven Near-Inertial Waves and Turbulence Mixing (invited)

Enrique Curchitser (Rutgers University): Eddy-Mean Flow Energetics of Western Boundary Currents (invited)

12:30—13:30 Lunch
13:30—15:30 Poster with coffee

15:30—17:30 Session 2 (Chair: host with introduction for each invited speaker)

Qianjiang Xing (University of Tasmania/ Ocean University of China): The role of mixing and geothermal heating in AABW and NADW circulation (invited)

Reiner Schlitzer (Alfred Wegener Institute): Using helium data to track hydrothermal inputs (invited)

Seth Danielson (University of Alaska Fairbanks): Changing stratification over Alaska region continental shelves suggests altered diapycnal mixing and nutrient fluxes (invited)

Tetjana Ross (Institute of Ocean Sciences, Fisheries and Oceans Canada): A video-plankton and microstructure profiler for the exploration of in situ connections between zooplankton and turbulence (invited)

18:00—20:00 Reception Forest Hongo
http://www.forest-hongo.com/en/
https://www.forest-hongo.com/en/location/

May 24 (Fri.) **hall open 08:45**

09:00—11:00 Session 3 (Chair: Jun Nishioka)

Ichiro Yasuda (The University of Tokyo): Development of micro-temperature methods attached to CTD for vertical mixing and observations

Shuhei Masuda (Japan Agency for Marine-Earth Science and Technology): Ocean state estimation and climate analysis through data synthesis of global mixing observations

Toshiyuki Hibiya (The University of Tokyo): A new parameterization of tidal mixing enhanced over abyssal rough bathymetry

Hiroyasu Hasumi (The University of Tokyo): Control of the Pacific deep and intermediate circulation by mixing and its role in the climate

11:00—11:40 Poster with coffee

11:40—12:30 Lunch (remove posters)

12:30—14:30 Session 4 (Chair: Hiroyasu Hasumi)

Jun Nishioka (Hokkaido University): Sub-polar marginal seas fuel the North Pacific Ocean through the intermediate water

Naomi Harada (Japan Agency for Marine-Earth Science and Technology): Characteristics of transportation effect of biogenic particles associated with the different mixing pattern in the western North Pacific

Xinyu Guo (Ehime University): Mixing processes, nutrient transport, fundamental structure of ecosystem in the Kuroshio region

Shin-ichi Ito (The University of Tokyo): Behaviors of small pelagics inferred from oxygen stable isotope ratio in otolith

14:30—14:40 Break

14:40—16:00 Summary & Discussion (Chair: Ichiro Yasuda)

Ichiro Yasuda (The University of Tokyo): Overview of the 4-years OMIX progress

Discussion:
Comments from the invited speakers
Comments from the advisory board members of the OMIX project

Poster Presentation: May 23 13:30—15:30 & May 24 11:00—11:40

WG1 P01-P14: Mixing observation, physics and circulation (Chair: Yutaka Yoshikawa, Kyoto Univ.)
WG2 P15-P33: Mixing & biogeochemical processes to sustain productivity (Chair: Hajime Obata, AORI, Univ. Tokyo)
WG3 P34-P44: Long-term (period) variability & fisheries (Chair: Hiroaki Tatebe, JAMSTEC)

WG1

Poster#	Author	Title	Group
P01	Shino Kimura	Correction method of fast-response thermistors data	A01-1
P02	Keunjong Lee	Evaluation of nutrient flux enhanced by double diffusion in the Kuroshio using glider measurements	A01-1
P03	Takahiro Tanaka	Evaluation of the underwater glider flight model using the electromagnetic current sensor	A01-1
P04	Daisuke Hasegawa	The Oyashio-TWC front observed by a microstructure glider	A01-1
P05	Shuo Zhai	Study on turbulent mixing in the North Pacific using DeepNINJA float	A01-1
P06	Ryuichiro Inoue	Biogeochemical float observations in the Kuroshio recirculation gyre during the spring transition	A01-1
P07	Satoshi Osafune	A data synthesis experiment using tide-induced mixing parameterizations	A01-2
P08	Nozomi Sugiura	Estimating energy input rate from vertical profiles of energy dissipation rate	A01-2
P09	David Spencer	Summertime vertical mixing in the Great Australian Bight	A01-1
P10	Sachihiko Itoh	Enhanced vertical mixing along a shelf-offshore transition zone	SM
P11	Kim Yoojun	Estimating diffusivities from laboratory experiment of heated wastewater discharged from power plant using thermo-color dyes	A04-7
P12	Yohei Onuki	Instabilities of finite-amplitude internal wave beams	SM
P13	Yusuke Ushijima	The Verification of the Parameterization of the PressureStrain Correlations in the Ocean Surface Layer	A04-7
P14	Takao Kawasaki	A modeling study on the deep Pacific meridional overturning circulation	A04-8

WG2

P15	Yusuke Sasaki	Simulation of global distribution of 231Pa and 230Th and sediment 231Pa/230Th ratio by using an ocean general circulation model	A01-1
P16	Shinzo Fujio	Ocean circulation around the Kamchatka Strait	A01-1
P17	Hajime Obata	Surface neodymium isotopic composition in the North Pacific Ocean and the Bering Sea	A02-3
P18	Hirofumi Tazoe	Nd isotopic features in the western subarctic Pacific Ocean	A02-3
P19	Yoshiko Kondo	Surface distribution of natural organic Fe-binding ligands in the North Pacific	SM
P20	Tetsuichi Fujiki	Time-series observations of photosynthetic oxygen production in the subtropical western North Pacific by an underwater profiling buoy system	A03-5

P21	**Toru Hirawake**	**Understanding of nutrients cycle based on phenology of primary production in the subarctic North Pacific Ocean**	**A02-3**
P22	**Toshimasa Doi**	**Construct of the global oceanic iron distribution based on the data assimilation approach**	**A01-2**
P23	**Kazuhiro Misumi**	**Numerical simulation of iron cycle in the North Pacific**	**SM**
P24	**Humio Mitsudera**	**Modeling of material circulations that link the Sea of Okhotsk, the Bering Sea and the North Pacific Ocean**	**SM**
P25	**Michio Watanabe**	**Role of deep ocean mixing on global carbon uptake evaluated with an Earth system model**	**SM**
P26	**Eisuke Tsutsumi**	**Observation and numerical modeling of turbulent mixing over seamount within the Kuroshio**	**A02-4**
P27	**Takeyoshi Nagai**	**How the Kuroshio Current delivers nutrients to sunlit layers on the continental shelves with aid of near-inertial waves and turbulence**	**SM**
P28	**Joji Ishizaka**	**High Chlorophyll-a Eddies Induced by Kuroshio and Topography on Tokara Strait**	**SM**
P29	**Naoki Yoshie**	**Effects of strong turbulent mixing on phytoplankton around the Tokara strait**	**SM**
P30	**Kiyotaka Hidaka**	**Plankton distribution around the area of enhanced turbulent vertical mixing along the Kuroshio**	**SM**
P31	**Makio C. Honda**	**Impact of cyclonic eddies and typhoons on biogeochemistry in the oligotrophic ocean based on time-series observation at the western Pacific subtropical station KEO**	**A03-5**
P32	**Mamoru Tanaka**	**Zooplankton and turbulence: implications of turbulence avoidance**	**A01-1**
P33	**Tomonori Matsuura**	**Elucidation of causes of maximum concentration distribution of chlorophyll-a below sea surface in spring**	**A01-1**

WG3

P34	**Tomoki Tozuka**	**Effective Ekman pumping in the Kuroshio Extension region**	**SM**
P35	**Ichiro Yasuda**	**Impact of the astronomical lunar 18.6-yr tidal cycle on El-Niño and Southern Oscillation**	**A01-1**
P36	**Masaki Hamamoto**	**The effect of 18.6 year lunar nodal cycle on Pacific Decadal Oscillation**	**A01-1**
P37	**Yumi Abe**	**A comparison of ocean deoxygenation between CMIP5 models and observational data**	**SM**
P38	**Kazuaki Tadokoro**	**Seasonal and interannual variation of mesozooplankton community structure in the Oyashio and Kuroshio-Oyashio Transition waters, western North Pacific**	**A03-5**
P39	**Maki Noguchi Aita**	**Change in lower trophic level ecosystems to decadal scale variation of climate system in the North Pacific Ocean**	**A03-5**
P40	**Takeshi Okunishi**	**On the relationship between sea temperature and fishing ground formations of chub mackerel in the region off Sanriku, northwestern Pacific**	**A01-1**
P41	**Tatsuya Sakamoto**	**Spatial differences in nursery habitats and early growth of sardine Sardinops sagax around South Africa**	**A03-6**
P42	**Tomihiko Higuchi**	**Estimation of experienced environment of jack mackerel in the East China Sea**	**A03-6**
P43	**Chenying Guo**	**Evaluating the metabolism and swimming performance of Pacific chub mackerel *Scomber japonicus* in the Northwest Pacific**	**A03-6**
P44	**Shin-ichi Ito**	**Influence of tide on the growth and migration of walleye pollock (Gadus chalcogrammus) in the Oyashio region.**	**A03-6**