The 10th Anniversary
AMEA with ECOPs OCEAN LITERACY CONFERENCE 2025 JAPAN

ABSTRACT

5th-6th, August,2025

2025 AMEA ECOPs Conference Program

Date	Time	Content	Venue
Aug.3 (Sun)		Some delegates arrive hotel	Hotel:Toyoko-inn Shinagawa Konanguchi Tennozu Isle
Aug.4 (Mon)	1500-2400	All delegates register for accommodation at Toyoko-inn Shinagawa Konanguchi Tennozu Isle	Above
	1500-2000	Conference registration for delegates who will come to the Hotel	University Cafeteria
	1500-1700	AEMA board meeting and informal pre-conference meeting	
	1800-2000	Free Meeting TIME with "DONBURI" Japanese family Dinner	
Day 1 at SASAKAWA PEACE FOUNDATION(SPF)			
Aug.5 (Tue)	0830-1200	Conference registration	SPF
	0900-0920	Opening ceremony Welcome Greetings Tsuyoshi Sasaki, Ph.D., Professor of TUMSAT Mistutaku Makino, Ph.D., President of Ocean Research Institute Valentina Lovat, Associate Programme Specialist – Ocean Literacy, IOC Project office Raphaël Roman, Consultant—Ocean Literacy, UNOC3, IOC Project Office, UNESCO Regional Bureau for Science and Culture in Europe	SPF ROOM-1
		Photo Shoot	
	0925-1010	Keynote Speach Yutaka Michida, Ph.D., Chair man of UNESCO-IOC, Professor Emeretus and Assistant to the President of the Univerisity of Tokyo	

Aug.5 (Tue)	1020-1200	Youth Conference Y-1 Mira Kato (Houou High School, Kagoshima), Umaiyo ! Sugyoiyo ! Minamisatsuma's deep-sea fish ! Y-2 Aiko Tenka, Ogawa Kosuke (Wakasa High School, Fukui), Effective Use of Purple Sea Urchins Y-3 Mirai Terada(Otone Junior High School, Saitama), The situation of plastic on Japanese beaches and its impact on fish Y-4 Haruto Seida, Ayana Hirahara,Chiharu Kimura, Yuji Tabata, Minato Tateishi, Keiji Shimomura (Momoyama Gakuin High School), Water Purification Project in Osaka Bay Area Y-5 Shihoko Kurofuchi(Student,Tokai Univ.,Takanawadai High School), The Difference in Water Quality According to the Water Sampling Points in a River Y-6 Wakana Sawazaki, Nanoha Sawazaki(Morioka Daiichi high school & Iwate Uni.Middle school), For a well- being Future Y-7 Yua Suzuki, Riho Iida, Mirei Suzuki(Konan Ocean Town Community School), What if we could eat fish caught from the canal? Y-8 Jack Ching and Sam Chandler (Student, The Harbour School Hong Kong), Student research on Artificial Reefs and Fish recruitment	SPF ROOM-1
	1200-1330	Lunch, general poster presentations, and student poster presentations on marine-related science education in Japan	SPF Lunch room
Aug.5 (Tue)	1330-1350	Session 1 Ocean Expert Presentaiton/ Masahiko Fujii,Ph.D. (Professor, Otsuchi Coastal Center, University of Tokyo)	SPF ROOM-1
	1350-1510	Concurrent presentaion/Chair: Professor Masahiko Fujii S1-1 ○Chiou-hui Chou, Chin-Chan Huang, Chun-Chiao Yeh, Wen-Ko Chan (Professor, National Tsing Hua University), Engaging High School Students in Ocean Literacy through an Experiment on Ocean Acidification S1-2 Angelica M Baylon, Ph.D. (Professor,Maritime Academy of Asia and the Pacific), MAAP Initiatives in Enhancing Ocean Literacy in the Philippines: Strategies and Integration Across the Maritime Sector S1-3 Joella Marie Balinis(Student,The Institute of Marine Engineering, Science and Technology (IMarEST)), Blue Tourism: The power of sustainable marine tourism in Legazpi City S1-4 John Terenzini (PhD. Cndidate, University of Plymouth), Citizen science as a marine education and policy tool r. Wu-Ching-Hung (NTOU), Application of Ai Image Recognition in Rip Current Education	
	1510-1520	Concurrent session discussion /Chair: Professor Masahiko Fujii	
	1520-1540	Tea Break	SPF Tea Room
	1540-1600	Session 2 Ocean Expert Presentaiton/S4-3 Wee Cheah, Ph.D. (Lecturer, Universiti Malaya), Expanding ocean observing system with affordable, customisable and open-source ocean buoy	SPF ROOM-1

	1600-1720	Concurrent presentaion/Chair:Dr.Wee Cheah S2-1 Chen, Pin-Yan(Student, National Taiwan Ocean Univeristy(NTOU)), Research on the Impact of Fish Consumption Education Experience Courses on Nutritional Awareness, Dietary Behavior, and Consumption Behavior S2-2 Sarah Taylor(Marine Science Manager, The Harbour School Hong Kong), Infusing Marine Science into Current School Curriculums to Improve Ocean Literacy S2-3 Wang Yangsheng (National Museum of Marin Biology and Assistant Manager of Aquarium BOT Hi scene World Enterprise Co., Ltd), Aquarium Practices in Marine Education and Ocean Literacy: A Case Study of Taichung Aquarium's "The Magical Journey of Little Pebble" S2-4 Ruiqian Li, Ph.D.(Associate Professor,Ocean University of China), Cultivating Ocean Literacy through Curriculum Innovation in Public Administration: A Case from Ocean University of China	
	1720-1740	Concurrent session discussion /Chair: Dr.Wee Cheah	
Aug.5 (Tue)	1330-1350	Session 3 Ocean Expert Presentaiton/ Tsuyoshi Sasaki,Ph.D. (Professor, TUMSAT), Developing the "Aquaponics STEAM Program" :For aiming to foster a deeper understanding of the interconnectedness of food systems and marine conservation	SPF ROOM-2
	1350-1510	Concurrent presentaion/Chair: Prof. Tsuyoshi Sasaki (TUMSAT) S3-1 Ensephabolia Syabaniyah Asiadi, Ryosuke Kitano, Toshihiko Hatai (Student, TUMSAT), Blue-Classroom: Building Cross-National Ocean Literacy Modules Through Local Species And Student Action S3-2 Chen Dajie,Duan Zhiyue,Fukumoto Kazuma(Student, TUMSAT), Technical Development of Net Cages for Juvenile Bigeye Tuna Acclimation and Farming and Educationing S3-3 Simon Losepicho Clementinah and Takafoin Bradley(Student, TUMSAT), Impact of policy frameworks to sustainable utilization of Ocean resources S3-4 Raphaël Roman(Consultant, Ocean Literacy, UNOC3, IOC Project Office, UNESCO Regional Bureau for Science and Culture in Europe)	
	1510-1520	Concurrent session discussion /Chair: Prof. Tsuyoshi Sasaki (TUMSAT)	
	1520-1540	Tea Break	SPF Tea Room

	1540-1600	Session 4 Ocean Expert Presentaiton/ Ayumi Hirose, Ph.D. (JSPS Researcher, University of Science Tokyo), Between Air and Sea: Divergent Nasal Evolution in Toothed and Baleen Whales	
	1600-1720	Concurrent presentaion/Chair: Dr. Ayumi Hirose S4-1 Wendy Wu & Ms. Blaire Ho(Programme Lead & Programme Officer, Ednovators), SPARK the Future of Education for Sustainable Development: Building Educators' Capacity on Designing Interdisciplinary Curriculum and Cross-Sector Partnerships in Schools S4-2 Ninja Mueller (Ph.D.student, University of Vechta), Exploring the concept of Speciesism in academic marine education S4-3 Carlos Rius Errando(Marine Science Center Specialist, The Harbour School Hong Kong), Bridging Sectors for Ocean Sustainability: A School-Based Seaweed Initiative as a Model for Cross-Sector Collaboration S4-4 Hani Nusantari (Program Manager, Yayasan Juang Laut Lestari (JARI)), From Tentacles to Tomorrow: Promoting Sustainable Fisheries Education through Octopus Narratives	SPF ROOM-2
	1720-1740	Concurrent session discussion /Chair: Dr. Ayumi Hirose	
	1800-2000	Evening welcoming event	10F Dining Hall

Day 2 at Tokyo University fo Marine Science and Technology (TUMSAT)			
Aug.6 (Wed)	0900-1200	Conference registration	TUMSAT ROOM-1
	0900-0920	Session 5 Ocean Expert Presentaiton/ Chia-Dai (Ray) Yen , Ph.D.(Associate Professor,NTOU), Waves of Identity: A Multilevel Study on the Effects of the Ocean Science Sequence Curriculum on Teachers' and Students' Ocean Identity and Students' Ocean Science Learning Outcomes	TUMSAT ROOM-1
	0920-1040	Concurrent presentaion/Chair: Associate Professor Chia-Dai (Ray) Yen S5-1 Ciao Wei Tseng(Student, Educational research institute, National Taiwan Ocean University), Enhancing Marine Conservation Awareness: Evaluating High School Students' Comprehension of Sustainability Concepts S5-2 Yoshihiro Niwa, Ph.D. (Researcher of International Polar and Earth Environmental Research Center, National of Institute of Polar Research), Ocean education through simple scientific hydrodynamic experiments in elementary and junior high school classes S5-3 Charu G (EnviroVision2050), Green Leaders: Empowering Youth from Landlocked Regions for Ocean and Climate Action S5-4 Xunhua Liu, Ph.D. (Professor,Marine Education Research Center of Ningbo University), The Construction of China's Marine Education System: Connotations, Challenges, and Realization	
	1040-1100	Concurrent session discussion /Chair: Associate Professor Chia-Dai (Ray) Yen	
	1100-1200	Special Talk: Yasuyuki Kosaka, Ph.D. and Yumi Obata(Superintendent of Obama City Board of Education, Teacher at Wakasa High School), Ocean exploration activities that emphasize dialogue in school education	
	0900-0920	Session 6 Ocean Expert Presentaiton/ Kazuya Fukuhara,Ph.D. (Assistant Professor, TUMSAT), Marine Natural Product Research on Marine Sponges (*Porifera*) and Sea Cucumbers (*Holothuroidea*)	TUMSAT ROOM-2

	0920-1040	Concurrent presentaion/Chair: Assistant Professor Kazuya Fukuhara S6-1 Mo Chen (Researcher,Guangxi Academy of Sciences), Advancing Marine Education Through Self-Funded Nature Education Initiatives S6-2 ○Jong-Mun KIM, Ph.D., Yi-Young KWON, Ph.D. (Directer of National Marine Biodiversity Institute of Korea), The Effects of the National Marine Biodiversity Institute of Korea's Summer Camp on the Ocean Literacy of Korean Elementary Students S6-3 Professor, Meghan E. Marrero, Ph.D. (Mercy University), Wading In: Developing Ocean Literacy through Connection and Curriculum Integration S6-4 Mohammad Muslem Uddin, Ph.D. (Professor, Department of Oceanography, University of Chittagong), Advancing Ocean Literacy via Satellite Technology: Establishment of the First Ocean Satellite Ground Station at the University of Chittagong, Bangladesh	
	1040-1100	Concurrent session discussion /Chair:Assistant Professor Kazuya Fukuhara	
	1100-1200	Special Talk: Yasuyuki Kosaka, Ph.D. and Yumi Obata(Superintendent of Obama City Board of Education, Teacher at Wakasa High School), Ocean exploration activities that emphasize dialogue in school education	TUMSAT ROOM-1
	1200-1300	Lunch, poster presentation	TUMSAT
Aug.6 (Wed)	1300-1330	Announcement for Itoigawa field trip and free time in Tokyo	TUMSAT ROOM-1
	1330-1350	Session 7 Ocean Expert Presentaiton/ Associate Professor Daisuke Inazu (Tokyo University of Marine Science and Technology)	
	1350-1510	Concurrent presentaion/Chair: Associate Professor Daisuke Inazu S7-1 Binlan Liang(Assistan researcher,Guangxi Academy of Sciences), Marine education Curriculum Practice in the Primary school stage S7-2 Jose Marie A. Eslopor (University Extension Specialist I, Regional Research Center, University of the Philippines Visayas), Understanding ocean literacy through research and experience perspectives among Filipino and Indonesian youth S7-3 ○Sicon Li, Tsuyoshi Sasaki, Ph.D.(Ph.D. Student, TUMSAT), Exploring the Relational Values between Forest River Ocean Nexus and Watershed Residents—The Study in the Hei River Basin in Miyako City, Iwate Prefecture, Japan S7-4 ○Teresa Kennedy,Tsuyoshi Sasaki, Valentina Lovat, Meghan Marrero, Ninja Mueller, Ray Yen & Li Ying Lin (Professor, University of Texas at Tyler), Advancing the Vision of the Ocean Decade: Empowering Ocean Literacy through Global Collaboration and Innovation	
	1510-1530	Concurrent session discussion /Chair: Associate Professor Daisuke Inazu	
	1530-1550	Tea Break	TUMSAT

	1550-1610	Final session: Refrected presentation/ Prof. Tsuyoshi Sasaki	TUMSAT ROOM-1
	1610-1630	Refrected presentaion from S1-6 and Wrap Up/Chair: Prof. Tsuyoshi Sasaki	
	1630	Free time, E.g. Visiting to Waters Takeshiba Artificial Beach in Tokyo Bay	

DAY1 Poster Presentation

Aug.5 (Tue)	12:20-13:20	P-01 CHEN,HSIN-SHIH (Taiwan Marine Education Center, National Taiwan Ocean University), Place as Home: Reconstructing the Relationship Between Sustainability and the Self Through a Field-Based Course P-04 Wakana Sawazaki, Nanoha Sawazaki(Student, Morioka Daiichi high school & Iwate Uni.Middle school), For a well- being Future P-05 Asahi Shibahashi, Rio Matsuda, Kurumi Shimazu, Momone Tatsumoto, Aoi Tada(Student, Momoyama Gakuin High School), Water Purification P-06, Makoto Suzuki(Representative director, Japan Sustainable Seafood Association), Marine Education: Using Fish on the Dinner Table as a Starting Point - The Challenge at Osakana Elementary School P-08 Misaki Yoshioka,Hinata Fujimura,Lisa Grim(Student,Linden Hall School Junior and Senior High School), Macro Impacts of Microplastics: Investigating Coastal Plastic Pollution P-09 Eri Furuta(Art Instructor, Nozomi Nursery School), The problem of marine plastic waste at Yuigahama Beach: Expressing the sea of my hometown through clinical art P-10 Akira Nagano, Ph.D. (Senior Scientist, Japan Agency for Marine-Earth Science and Technology), International Kuroshio collaborative research programme – 2nd Cooperative Study of the Kuroshio and its Adjacent Region (CSK-2) P-11 Masakazu Shiraishi(City Council Member, Miyako City), Local Community Develpoment Engagement collaborating with University	SPF-ROOM2

DAY1 Poster Presentation of Pioneer School Program			
Aug.5 (Tue)	12:20-13:20	PSP-1 Kokoro HORIHATA, Misora SATO, Kohsuke SEKINE, and Manami OKUBO (Ritsumeikan Keisho Junior and Senior High School), Exploring Kombu's Strengths: A Local Approach to Global Potential PSP-2 Kosuke ISHIKAWA and Shuhei MIYATA (Mie Junior and Senior High School), "Umi no gakkou" (Marine School), an initiative of the Mie Junior High School PSP-3 Ryo MAEDA, Riku TAKEBAYASHI, and Masayuki YANAGI (Okayama Gakugeikan High School), Feasibility study of long-term storage of eelgrass seeds PSP-4 Miku EGUCHI, Sachiko SATO, and Tomohiro OOKUBO (Komatsushimanishi High School), Exploring the expanding network of eelgrass bed restoration: collaboration with companies outside the prefecture and high school students nationwide PSP-5 Joh OKADA, Taketo SHOJI, and Hidefumi HATASHIMA (Sasuna Elementary School, Tsushima City) Research and survey on the biodiversity of coastal areas in the Sasuna Elementary School area of Tsushima City PSP-6 Aira HIGA and Masumi OHSIRO (Toyomi Elementary School, Toyogusuku City), A program aimed at understanding, appreciating, and actively contributing to the preservation of Manko, a Ramsar-designated wetland and a treasured part of our hometown.	SPF-ROOM2

DAY2 Poster Presentation			
Aug.6 (Wed)	12:20- 12:50	P-02, Hiromi Inoue, Renhao Gao, Jina Ku, Ms. Mizuho Kato(Master student, Tokyo University of Marine Science and Technology), Why doesn't OLs penetrate society? P-03 Yiran Li, Tsuyoshi Sasaki, Ph.D.(Master student, Tokyo University of Marine Science and Technology), Branding Eco-Friendly Products: An Empirical Study Using Conjoint Analysis in Japan P-05 Asahi Shibahashi, Rio Matsuda, Kurumi Shimazu, Momone Tatsumoto, Aoi Tada(Student, Momoyama Gakuin High School), Water Purification P-07, Subaru Nakazato, Tadashi Nakazato(Student at Tokyo Metropolitan College of Industrial Technology, Head Teacher at Shibuya Municipal Uehara Junior High School), Developing a Simple Method for Investigating Plastic in Seawater in Inquiry-Based Learning P-11 Masakazu Shiraishi(City Council Member, Miyako City), Local Community Develpoment Engagement collaborating with University	TUMSAT Cafereria

Greetings

Tsuyoshi Sasaki, Ph.D. (President of AMEA, Professor, Tokyo University of Marine Science and Technology), Japan

ABSTRACT

Ladies and gentlemen, thank you very much for your participation today. The AMEA with UN Ocean Decade endorsed program for Early Career Ocean Professionals ECOPs Ocean Literacy Conference 2025 JAPAN, celebrating AMEA 10 years anniversary of dedicated efforts to promote Ocean Literacy. I serve as the President of the Asia Marine Educators Association. It is a great honor to gather with over 100 distinguished participants from UNESCO IOC headquarters, the United States, republic of Korea, Taiwan, Hong Kong, China, Philippines, Indonesia, Kenya,Papua New Guinea, Malaysia, Germany, Bangladesh, as well as elementary, middle, high school students, and university students and undergraduate students. This conference is a vital opportunity for us to share the UN Ocean DECADE, the global challenges facing our oceans, to foster the next generation of leaders, and to work together toward a sustainable future. The oceans are the lifeline of our planet, and international cooperation and partnership are essential. I encourage everyone to bring together your wisdom and passion to create ideas and build partnerships that will help protect our oceans. To the young participants, I hope you understand the importance of our oceans and actively participate as future leaders. Finally, I sincerely hope that this conference will deepen your learning and strengthen your connections, opening new doors for collaboration. I look forward to seeing the bright future of all participants. Thank you very much for your participation.

PROFILE

Tsuyoshi Sasaki, Ph.D., is professor at the Tokyo University of Marine Science and Technology, where he is dedicated to advancing marine education and fostering international collaboration. His career in education began in 1990 as a high school teacher at Iwate Prefectural Miyako Fisheries High School. In 2006, he joined Tokyo University of Marine Science and Technology as an Associate Professor and became a member of the National Marine Educators Association at the same year. A recognized leader in marine education

across Asia, Dr. Sasaki has served as President of the Aquatic Marine Environmental Educators Association since 2012 and the Asia Marine Educators Association since 2015. He was promoted to Professor in 2018. In 2023, he played a key role in establishing the Ocean Town Community School, a pioneering initiative to integrate Ocean Literacy into community-based learning.

CHALLENGE 10 of OCEAN DECADE

Challenge 9**Skills, Knowledge, and Technology for All**- Build capacity, share knowledge, and transfer marine technology to ensure equitable access to ocean science, particularly for developing countries.;Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.;

Keynote Speech

Towards Inspiring and Engaging Ocean

Yutaka Michida, Ph.D.(the Chair of Intergovernmental Oceanographic Commission of UNESCO (IOC) , Specially Appointed Professor, Special Presidential Envoy for UN Ocean Decade, The University of Tokyo), Japan

ABSTRACT

The United Nations Decade of Ocean Science for Sustainable Development (2021-2030) (UN Ocean Decade, hereafter) is now turning into its second half toward the 2030 goal. Among its seven societal outcomes, 'an Inspiring and Engaging Ocean' is particularly important in view of its long term perspective. After the conclusion of the UN Ocean Decade in 2030 associated with the target year of SDGs, the ocean will keep with no doubt its overall functions including moderation of climate change, major supplier of our foods, indispensable field in global economy such as for transportation and for resource exploitation, and most importantly, the ocean sustains global ecosystems not that in the ocean but land-based ones as it is a huge reservoir of water on the planet. It means that we human beings should keep our ocean as healthy as possible, and even in better conditions beyond 2030 for coming generations with consideration with hundreds years insight. Along this line 'an Inspiring and Engaging Ocean', one of the societal outcomes of UN Ocean Decade, is most essential in terms of log-lasting activities to save the ocean. As we see this outcome is closely related ocean literacy and marine education. Improving the public awareness and literacy of the ocean in one of the core initiatives of the UN Ocean Decade. The Intergovernmental Oceanographic Commission of UNESCO (IOC), established in 1960 as a competent UN body for ocean science and services, has been playing a leading role in promotion ow UN Ocean Decade since the preparatory stage. Some ongoing IOC activities related to ocean literacy and education will be shared for future actions to take.

PROFILE

Yutaka MICHDA, PhD., Special Presidential Envoy for UN Ocean Decade, The University of Tokyo since 2024. Graduated from The University of Tokyo in 1981 majored in Physical Oceanography, then completed its master course in 1983, then obtained PhD. in 1999. He joined Japan Coast Guard (JCG) as a technical and research officer in 1984 and worked until 2000, when he moved to The Ocean Research Institute of the University of Tokyo as an

associate professor, then promoted to be a professor in 2007. He was the Deputy Director of Japan Oceanographic Data Center from 1997 to 1999 during his service in JCG, and from 2015 to 2019 he was a vice Director of Atmosphere and Ocean Research Institute (AORI) of the University of Tokyo. He is the first Japanese to have been elected to the Chair of Intergovernmental Oceanographic Commission of UNESCO (IOC) in 2023, and presently in his second term as the Chair of IOC until the end of June 2027. His academic major is physical oceanography with an expansion to cover ocean policy over the last 20 years. Currently he is the president of Japan Society of Ocean Surveys and Technology since 2017, and Japan Driftological Society since 2021. H has been awarded several academic and national awards including a Prime Minister's prize for promotion of oceanic nation in 2015.

CHALLENGE 10 of OCEAN DECADE

Challenge 9**Skills, Knowledge, and Technology for All**- Build capacity, share knowledge, and transfer marine technology to ensure equitable access to ocean science, particularly for developing countries.;Challenge 10**Change Humanity’s Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.;

Youth Conference

Y-1

Umaiyo ! Sugyoiyo ! Minamisatsuma's deep-sea fish !

Mira Kato(Student, Houou Highschool), Japan

ABSTRACT

Utilizing Deep-Sea Fish Bycatch in Minamisatsuma City

This initiative aims to find sustainable uses for deep-sea fish that are currently caught as bycatch and discarded during Jack-knife prawn fishing at Kasasa Nomaike Fishing Port in Minamisatsuma City.

Background and Problem

Jack-knife prawn (scientific name: Haliporoides sibogae) fishing has been a prominent industry in Minamisatsuma City since the 1960s. However, deep-sea trawling nets frequently catch deep-sea fish as bycatch. Historically, these non-marketable deep-sea fish have been discarded as "underutilized fish." Recognizing this waste, we decided to explore methods for utilizing these deep-sea fish, focusing on their potential as both food and educational materials.

Our Activities and Progress

Our practical efforts began in May 2023. In 2023, we concentrated on food utilization, developing original deep-sea fish recipes. We also conducted community engagement activities, such as tasting events and outreach classes at local nurseries and elementary schools, to connect the community with deep-sea fish.

In 2024, our focus shifted to educational materials. We created cards featuring anatomical charts of deep-sea fish. We then held events for local elementary and junior high school students, where they could use these to learn about and become more familiar with deep-sea fish.

Future Plans

Looking ahead, we plan to conduct more specialized research. Our goal is to examine the internal organs of deep-sea fish, investigating how the coloration of organs varies with their ecology and exploring their feeding habits based on stomach contents.

PROFILE

Houou High School Science Club

Introduction

The Houou High School Science Club, established in 2016, is an active group of 26 members based in Minamisatsuma City, Kagoshima Prefecture. We are passionate about making science accessible and exciting for everyone in our local community.

Club Overview

The Houou High School Science Club, based in Minamisatsuma City, Kagoshima Prefecture, is dedicated to science. We plan and conduct hands-on activities like experimental classes, dissection classes, and various workshops to share the joy of science with local children. We believe in empowering each member to use their unique interests and strengths to deepen their spirit of inquiry. Our focus areas are deep-sea fish and XR (Cross Reality), and we're committed to showcasing the wonders of science through community-rooted activities.

Activity Highlights

・Since 2021: Deepened activities related to deep-sea fish.
・Since 2024: Initiated activities related to XR (Cross Reality).
・Recent Key Activities:
  ・Designed the wrapping for Minamisatsuma City's autonomous driving bus using XR.
  ・Held deep-sea fish dissection classes in collaboration with Kyushu University.
  ・Set up workshops at local events.

Strengths and Features

・Community-Oriented: We conduct activities with a strong focus on contributing to the local community in Minamisatsuma City.
・Practical Learning: We provide practical science experiences for local children through our experimental and dissection classes and workshops.
・Specialized Focus: Our dedicated teams for deep-sea fish research and XR technology inquiry allow us to deepen our specialized knowledge and skills.
・Fostering Inquiry: We offer an environment where members can connect their interests and strengths to their activities, fostering an independent spirit of inquiry.
・Diverse Collaborations: Our partnerships with external organizations, such as Kyushu University, help expand the scope of our activities.

Future Outlook

As a community-rooted science club, we're dedicated to sharing the fascination and depth of

science with even more people in Minamisatsuma City and beyond.

CHALLENGE 10 of OCEAN DECADE

Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.;Challenge 3**Sustainably Feed the Global Population**- Develop innovative and sustainable ways to use marine resources for food production, ensuring food security while maintaining healthy ecosystems.;Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

Y-2

Effective Use of Purple Sea Urchins

Aiko Tenka, Ogawa Kosuke(Student,　Wakasa High Schol), Japan

ABSTRACT

In our coastal areaYasiro,too many purple sea urchins are causing a serious problem. They eat seaweed and destroy seaweed beds, we call this problem “isoyake” (barren rocky seafloors). This is bad for the marine environment and for the local fishing industry.

At Wakasa High School, we are studying how to use these purple sea urchins in a useful and sustainable way. Usually, only the meat inside the sea urchin is used for food.It is valuable But we are also thinking about how to use the shells, such as for crafts,fertilizer and chalk.This helps reduce waste and adds value.

Our project is closely connected to the local community. We work with local people, learn from fishermen, and think about solutions together. We received a lot of help from Mr.Kadono,a fisherman in Yashiro.

Next, we plan to do joint research with students in Himi City, Toyama Prefecture, where similar activities are happening. By working together, we can share ideas and learn more about the sea and sustainable use of marine resources.

Through this project, we hope to help both nature and our community. We also want more people to know about the problem of isoyake and think about ways to protect the ocean.

PROFILE

We are second-year students in the Department of Marine Science at Wakasa High School. Our studies focus on understanding the ocean, marine life, fish,ships,and environment At school, we actively participate in hands-on activities such as fieldwork and research using our training ship Unryu-maru. These experiences make me more interested in marine science.

We also join school projects about how to use purple sea urchins. We enjoy learning how to protect and use the ocean for the future.

We are motivated and work hard. We want to learn more about marine science. We believe that working in a marine-related job will let me help the environment and society.

CHALLENGE 10 of OCEAN DECADE

Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.;Challenge 3**Sustainably Feed the Global Population**- Develop innovative and sustainable ways to use marine resources for food production, ensuring food security while maintaining healthy ecosystems.;Challenge 4**Develop a Sustainable Ocean Economy** - Promote sustainable economic activities in the ocean, such as fisheries, renewable energy, and tourism, while minimizing environmental impacts.;Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

Y-3

The situation of plastic on Japanese beaches and its impact on fish

Terada Mirai(Student, Kazo Middle School), Japan

ABSTRACT

The reason why I did this research was because I saw a special feature on the plastic problem on TV and wondered what was actually going on.

PROFILE

Mirai Terada studied the problem of plastics in Japan and won the best prize at the "Morikawa Umimachi Children's Summit" in Japan.

CHALLENGE 10 of OCEAN DECADE

Challenge1 **Understand and Beat Marine Pollution- Identify and eliminate sources of pollution in the ocean, including plastics, chemicals, and other pollutants, to protect marine ecosystems and human health.

Y-4

Water Purification

Haruto Seida, Ayana Hirahara,Chiharu Kimura, Yuji Tabata, Minato Tateishi, Keiji Shimomura (Student, Momoyama Gakuin High School), Japan

ABSTRACT

We are engaged in an activity that purifies water in rivers and other bodies using recycled disposable hand warmers, which would normally be thrown away. This project began when our club advisor learned through an acquaintance that used hand warmers could be utilized to purify water. Inspired by this idea, we considered whether a similar initiative could be carried out at our school.

We conduct this project in cooperation with a Japanese company called Go Green Japan, which is also the origin of our project's name. The company collects used hand warmers from across Japan and produces the cubes we use. As part of our activities, we also collect used hand warmers within our school every winter and send them to the company for reuse.

Specifically, we use cubes made from the powder inside used hand warmers and place them in bodies of water such as the moat of Minegazuka Kofun—part of the Mozu-Furuichi Kofun Group, a UNESCO World Heritage Site—and the Dotonbori River, a famous tourist destination in Osaka. Through approximately four years of continuous effort, we have confirmed visible improvements in water clarity.

Moving forward, we hope to spread awareness of this activity and carry out water purification efforts in various locations. By promoting sustainable practices and rethinking waste, we aim to contribute to solving environmental issues through student-led initiatives.

PROFILE

We are "Momoyama Go Green Project," a student group from Momoyama Gakuin High School (St.Andrew's school)　in Osaka that mainly focuses on environmental activities related to the SDGs. This is our fifth year of activity, and we currently have around 30 members.

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carried out at our school.

CHALLENGE 10 of OCEAN DECADE

Challenge1 **Understand and Beat Marine Pollution- Identify and eliminate sources of pollution in the ocean, including plastics, chemicals, and other pollutants, to protect marine ecosystems and human health.

Y-5

The Difference in Water Quality According to the Water Sampling Points in a River

Shihoko Kurofuchi(Student,Tokai Univ.,Takanawadai High School), Japan

ABSTRACT

I participated in the “Morikawa Umimachi Kodomo Summit” held in December last year, and gave a presentation titled “Survey on Water Quality around Takeshiba”. Although I would like to give a presentation on the same topic in the future, in addition, I will survey the water quality of the sea and the river in Okinawa, and the Arakawa River in Kumagaya City. After that, I will give a presentation on the differences between the different samples.

PROFILE

CHALLENGE 10 of OCEAN DECADE

Challenge1 **Understand and Beat Marine Pollution- Identify and eliminate sources of pollution in the ocean, including plastics, chemicals, and other pollutants, to protect marine ecosystems and human health.

Y-6, P-4

For a well- being Future

Wakana Sawazaki, Nanoha Sawazaki(Student, Morioka Daiichi high school & Iwate Uni.Middle school), Japan

ABSTRACT

We are sisters who organize the “Great Crayfish Fishing Tournament” in the pond at Morioka Castle Ruins Park. The impetus for this event came from our realization during our favorite dragonfly fishing.We started surveying dragonflies in 2018 and went out every week to survey dragonflies. By visiting the same locations over and over again, we noticed changes in the natural environment and noticed a decrease in dragonflies and an increase in American crayfish. Since we started our dragonfly survey six years ago, the number of American crayfish has increased overwhelmingly, and the number and variety of dragonflies we can catch has decreased. Around the same time, I learned that the people living around the pond had held a meeting because of the bad odor of the pond. I realized that one of the causes of these problems was the large proliferation of American crayfish. Therefore, I started this activity in 2021 to exterminate American crayfish with the aim of restoring the pond's original ecosystem. By continuing to hold this event, we began to see small changes in the pond. (1) Crayfish in the pond have become smaller and their numbers have decreased. (2) The number of small fish in the pond has increased. (iii) The number of fireflies flying around the pond has increased. (iv) The number of people looking into the pond and fishing for crawfish has increased.

PROFILE

We are sisters who love dragonflies. We fell in love with the beauty of dragonflies, and my father and I continued our dragonfly surveys and created a dragonfly map. In our surveys, we also observe the nature around us. After four years of these surveys, we noticed a large population of American crayfish in the pond, and since 2021, we have been holding a “big crayfish fishing contest” at Morioka Castle Ruins Park. In the beginning, my mother and the three of us planned and prepared for the event, but we have continued it for the past five years by recruiting members to run it every year. Everyone gets involved and enjoys the American Crayfish Extermination Activity.

In 2022, we won the Minister of the Environment Award at the Green Blue Education Forum

(GBEF); in 2023, we won the Special Jury Award at the GBEF and the Grand Prize at the Morikawa Sea Town Children's Summit; in 2024, we participated on the secretariat side as a judge and discussion panelist at the GBEF; and we participated in the Morikawa Sea Town Children's Summit exhibition. This year's GBEF will be held at Expo '70 in Osaka/Kansai, and we will participate as a publicity ambassador, moderator of this competition, activity presenter, and panelist to share our crawfishing competition activities to the world.

CHALLENGE 10 of OCEAN DECADE

Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.

Y-7

What if we could eat fish caught from the canal?

Yua Suzuki, Riho Iida, Mirei Suzuki(Konan Ocean Town Community School), Japan

ABSTRACT

As part of our efforts to achieve the Sustainable Development Goals (SDGs), we investigated the potential of utilizing the marine resources of the Takahama Canal, which is in close proximity to us, as a food source.We wanted to try eating the mullet caught in the canal, so we researched whether it was safe to do so. We wanted to enjoy the mullet caught in the nearby Takahama Canal, so we explored ways to make that happen. First, we examined the water quality of Takahama Canal using a method known as Chemical Oxygen Demand (COD) to assess its quality. We compiled the results and conducted interviews with individuals who have consumed fish from the canal. After that, we considered how we could raise awareness among more people.

PROFILE

CHALLENGE 10 of OCEAN DECADE

Challenge1 **Understand and Beat Marine Pollution- Identify and eliminate sources of pollution in the ocean, including plastics, chemicals, and other pollutants, to protect marine ecosystems and human health.

Y-8

Student research on Artificial Reefs and Fish recruitment

Jack Ching and Sam Chandler (Student, The Harbour School Hong Kong), China

ABSTRACT

At the Harbour School, we have conducted research on coral restoration and Artificial reef development. Sam Chandler has studied coral growth affected by light and researched seaweed growth, while Jack Ching interest in Artificial Reefs was sparked by a school field trip to the AR development company D-Shape. This experiment aims to expand existing knowledge of ocean restoration and its effects, providing us with valuable experience and real-world insights.

Coral reefs cover less than 0.1% of the ocean surface but support over 25% of marine species and provide ecosystem services benefiting more than one billion people worldwide. Despite their importance, reefs are rapidly declining due to climate change, ocean acidification, and human impacts, with projections estimating a 70–90% loss by 2050, threatening biodiversity and livelihoods. Artificial reefs (ARs) have emerged as a conservation tool to mitigate biodiversity loss by providing habitat structures that mimic natural reefs, promoting marine species settlement and breeding. Pre-seeding ARs with live coral may accelerate ecosystem development by increasing recruitment rates of sessile organisms and attracting fish sooner; however, comparative studies on fish recruitment remain limited.

Our research investigates whether attaching live corals to ARs accelerates fish recruitment in a controlled aquarium environment over two weeks. At the Marine Science Center, we have a 500L salt water tank that we used for our study. We deployed two identical AR that we build using clay, one that is attach with 4 spices of coral and one without. Using Go Pro cameras, we record, observe, and analysis fish interaction with each AR.

We hope the results clarify the role of live coral in enhancing early fish recruitment on ARs, offering valuable insights for reef restoration strategies. This research supports coral-enhanced ARs as a promising approach to accelerate marine biodiversity recovery in degraded habitats.

PROFILE

Jack Ching was born in Hong Kong, a 17 year old high school student in the Harbour School. He is passionate about Artificial reefs development and its potential effect in enhancing marine conservation. He participated in many sustainable conference Hong Kong where he shared his ideas and learn knowledge to other people who are also passionate about sustainability. He is also the TASS ambassador in our school, where he leads in many school's sustainable development projects. He is a active participant of the Model United Nations club where he won a Best Speaker award in a conference.

Sam is a 16 year old student born in Hong Kong who is currently in grade 10 at The Harbour School. He is passionate about marine conservation, ocean literacy, and learning more about the many unexplored world that covers most of our planet. In previous years, he has conducted research projects on seaweed growth, coral growth, and now on artificial reefs alongside my peer Jack. Aside from marine science, he is passionate out sustainability, and Model United Nations team, and have won 1 best delegate award, and had well over 7 honourable mentions!

CHALLENGE 10 of OCEAN DECADE

Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.;Challenge 3**Sustainably Feed the Global Population**- Develop innovative and sustainable ways to use marine resources for food production, ensuring food security while maintaining healthy ecosystems.;Challenge 4**Develop a Sustainable Ocean Economy** - Promote sustainable economic activities in the ocean, such as fisheries, renewable energy, and tourism, while minimizing environmental impacts.;Challenge 5**Unlock Ocean-Based Solutions to Climate Change** - Advance research and solutions to address the ocean's role in mitigating climate change, including carbon storage, ocean renewable energy, and coastal protection.;Challenge 7**Expand the Global Ocean Observing System**- Enhance the global system for ocean observations, ensuring better data collection, sharing, and application to support science and decision-making.;Challenge 9**Skills, Knowledge, and Technology for All**- Build capacity, share knowledge, and transfer marine technology to ensure equitable access to ocean science, particularly for developing countries.;Challenge 10**Change Humanity’s Relationship with the Ocean** - Foster awareness, education, and behavioral

change to inspire a more sustainable and respectful relationship with the ocean.

Oral Presentation

S1-1

Engaging High School Students in Ocean Literacy through an Experiment on Ocean Acidification

○Chiou-hui Chou, Chin-Chan Huang, Chun-Chiao Yeh, Wen-Ko Chan(Professor, National Tsing Hua University), Taiwan

ABSTRACT

Ocean literacy is an understanding of the ocean's influence on you—and your influence on the ocean. As the Ocean Literacy Principle #5 states, the ocean supports a great diversity of life and ecosystems. To further advocate and enhance ocean literacy, this paper presents a science module in a high school course to implement ocean sciences to inspire early career ocean professionals in developing marine inquiry research. This module engaged students in a hands-on experiment to explore about how rising atmospheric carbon dioxide (CO_2) concentration, causing decreased pH, leads to ocean acidification, which is a threat to coastal and marine ecosystems and organisms. While conducting the experiment, students were able to understand the process of marine calcification and to explain why calcifying organism such as corals, mollusks, echinoderms, and plankton have shown negative impacts from increased oceanic CO_2 concentrations. The class module was structured in three phases (a) the conceptual introduction section, covering the roles of carbonate chemistry and carbonic anhydrase in biological calcification, (b) the experimental manipulation section, where students built a simple photometer and used phenolphthalein and lime water to simulate CO_2 uptake, observed color changes, and recorded turbidity and pH shifts, and (c) the results and discussion section, where students analyzed how decreasing pH reduced carbonate saturation and hindered $CaCO_3$ precipitation or caused shell dissolution. Through guided observation, students visualized the dynamic equilibrium between CO_2, bicarbonate, and carbonate ions, which helped them relate these chemical principles to real-world phenomena of ocean acidification. The module facilitated students in an extended discussion on the ecological impacts of acidification, mitigation strategies for CO_2 emissions, and the importance of sustainable marine resource management. This module helped deepen students' conceptual understanding of ocean acidification, cultivate ocean literacy with scientific inquiry skills, making it suitable for ocean scientific inquiry and marine education.

PROFILE

Chiou-hui Chou is an associate professor at the department of English Instruction, National

Tsing Hua University, Taiwan. Her research interests are in bilingual education, TESOL, reading education, and teachers' professional development.

Chin-Chan Huang is a high school science teacher at National Chutung Senior High School, Taiwan. He teaches Chemistry and science inquiry projects. He holds a master's degree in chemistry.

Chun-Chiao Yeh is a high school science teacher at National Chutung Senior High School, Taiwan. He teaches earth science and science inquiry projects. He holds a master's degree in hydrological and oceanic sciences. He is a member of Taiwan Marine Education Center.

Wen-Ko Chan is the principal at National Chutung Senior High School, Taiwan. He holds a doctorate in education.

CHALLENGE 10 of OCEAN DECADE

Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.

S1-2

MAAP Initiatives in Enhancing Ocean Literacy in the Philippines: Strategies and Integration Across the Maritime Sector

Angelica M Baylon, Ph.D. (Professor, Maritime Academy of Asia and Pacific), Philippines

ABSTRACT

This paper examines the multifaceted approach undertaken by maritime educational institutions in the Philippines, like the Maritime Academy of Asia and the Pacific (MAAP), to promote ocean literacy across diverse regional contexts and sectors of the maritime industry. It highlights region-specific initiatives in Luzon, Visayas, and Mindanao, emphasizing tailored strategies that address local environmental and socio-economic conditions. The study highlights the integration of ocean literacy into curricula, experiential learning activities, community outreach programs, and sectoral practices, including sustainable shipping, fisheries management, renewable energy, and eco-tourism. Furthermore, it examines the crucial role of multi-sectoral collaborations, which involve government agencies, non-governmental organizations, industry stakeholders, and local communities, in advancing these initiatives. The deployment of digital tools and online platforms is also discussed as a means to expand reach and engagement. The outcomes demonstrate increased awareness, community participation, and the development of environmentally conscious maritime professionals, contributing to sustainable ocean management. The paper concludes with recommendations for scaling these efforts, particularly in remote and indigenous communities, and integrating climate resilience education to strengthen the Philippines' maritime sustainability and industry resilience in the face of climate change.

PROFILE

Dr Angelica Baylon is the MAAP External Relations Director, PAEPI Global Chair, and President Emeritus, and a member of the Board of the AMEA.

CHALLENGE 10 of OCEAN DECADE

Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S1-3

Blue Tourism: The power of sustainable marine tourism in Legazpi City

Joella Marie Balinis (Student, University of Santo Tomas- Legazpi), Philippines

ABSTRACT

Legazpi is teeming with opportunities. From port resilience and sustainable shipping, the city has it all.

As a coastal community, it has long relied on fishing as one of its livelihood. Unfortunately, as the city industrialized, the jobs and habitats of the people were shattered. What used to be a teeming place of fisheries is now an almost dead coastal village. We used to call it Victory Village. Now it's nothing more than a stinking village filled with garbage and oil slick.

Additionally, the tourism industry also is gaining ground as the new local government is pushing for a more robust policies to attract foreign investors and tourists.

Coastal tourism hotspots like Boracay and Palawan face water quality degradation from chemical effluents in spas, hotels, and unregulated waste systems. In April 2018, Boracay needed a complete closure crashing our country's tourism.

Legazpi City must be able to protect our beaches and bays to prevent the same thing happening to us. This is a great opportunity for sustainable and regenerative marine tourism to be at the heart of this industrialization.

This presentation will focus on three key thematic areas:
1. My thesis on the Legazpi City Convention Center and its SWOT Analysis as a case study

2. The Legazpi City as a the "City of Fun and Adventure" putting sustainability in its economic agenda

3. How youth, through the AMEA and its networks, catalyze ocean literacy for policy reforms.

This will ensure that there's a balance of local and regional perspective on my oral

presentation.

PROFILE

• International

1. Member of the Royal Institute of Navigation - Younger Members' Group, I advocated for wider inclusion of the RIN outside of the UK to be globalized. It's during my time in RIN-YMG that the first Filipino awardee of the prestigious WGP Lamb Award, and the first chairperson of a committee.

2. Student-member of the Institute of Marine Engineering, Science and Technology (IMarEST), I lobbied for sustainable tourism to be included in the works of the IMarEST.

• Regional

3. Youth committee member, Asia Marine Educators Association (AMEA), empowered by the IMarEST

• Local

4. President of the Tourism Society. During my times, we conducted outreach programs in the far-flung areas of Legazpi. The club also organized several seminars and capacity-strengthening activities for the future tourism professionals

CHALLENGE 10 of OCEAN DECADE

Challenge 4**Develop a Sustainable Ocean Economy** - Promote sustainable economic activities in the ocean, such as fisheries, renewable energy, and tourism, while minimizing environmental impacts.;Challenge 10**Change Humanity’s Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S1-4

Citizen science as a marine education and policy tool

John Terenzini (PhD student, University of Plymouth), Hong Kong

ABSTRACT

The United Nations has declared 2021-2030 as the Decade for Ocean Science for Sustainable Development and recognizes the contributions that citizen science can make towards ocean research and education. There are gaps in knowledge about the marine biodiversity in Hong Kong and the Hong Kong Jellyfish Project (HKJP) was launched in 2021 to explore the presence of jellyfish locally and educate the general public about these poorly understood and frequently feared animals. My talk showcases the Hong Kong Jellyfish Project as a case study using marine citizen science to engage and educate participants about jellyfish. The HKJP encompasses a bilingual website, iNaturalist project, print media, newsletters, and social media platforms to promote participation in the citizen science project and to disseminate jellyfish educational materials to participants and the general public. Project results are also promoted through public presentations and published materials to diverse audiences from the general public, swim and dive groups to academic audiences, requiring different communication styles to connect with the varied audiences. A survey, conducted in 2021 and 2022, examined the motivations and barriers to participation in the HKJP, finding that many participants wanted to contribute to science and to learn more about jellyfish. By contributing to scientific research, citizen science participants gain experience in scientific processes, species identification, and foster a greater understanding overall of marine ecosystems. To increase understanding of Hong Kong's marine biodiversity and promote the use of citizen science for policy-making, a key goal of the HKJP is to promote the monitoring of jellyfish in Hong Kong to inform biodiversity and conservation policy, as the next iteration of the Hong Kong Biodiversity Strategy Action Plan is being assembled this year.

PROFILE

My 20+ year career in outdoor education and adventure guiding, leading participants in marine environments through snorkelling and kayaking, inspired me to pivot to a research-focused career path by completing a Masters in Environmental Management from The University of Hong Kong. Soon after I created the Hong Kong Jellyfish Project (HKJP) to engage the public in marine science and gather data on jellyfish, a much overlooked part of

Hong Kong's biodiversity. My current PhD with the University of Plymouth is building upon my HKJP work, from which I have published 6 articles. As a research assistant at the State Key Laboratory of Marine Pollution at the City University of Hong Kong, I was in charge of a project installing subtidal oyster reefs in a local bay to investigate their effects on biodiversity. I also led a remote monitoring project of a mangrove plantation, examining the success of the plantation and changes to intertidal biodiversity from installed shoreline features. I have expanded my experience doing citizen science as a Programme Manager for the first-ever City Nature Challenge (CNC) in the city of York, UK, where I've co-authored a paper summarizing research into the experiences of U.K. CNC organisers.

CHALLENGE 10 of OCEAN DECADE

Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S1-E

Continuous monitoring of ocean acidification and global warming parameters in Otsuchi Bay, Iwate Prefecture, Japan: a collaborative study with a local high school

Masahiko Fujii, Ph.D. (Professor, International Coastal Research Center, Atmosphere and Ocean Research Institute, The Univesity of Tokyo), Japan

ABSTRACT

In the Sanriku region of Japan where fishing and aquaculture are important local industries, there has been a conspicuous rise in sea water temperatures in recent years due to global warming and the Kuroshio Current meandering. And whether this relates to the decrease in cold-water fish species, recruitment of warm-water fish species, frequent mortality of cultivated shellfish species, and shellfish poisoning has been an active topic of discussion. There is also concern about the future impact of ocean acidification caused by global anthropogenic CO2 emissions on shellfish aquaculture species. Under these circumstances, there is an urgent need to understand the current status of global warming and ocean acidification indices and to predict future trends, which will provide a scientific basis for determining adaptive measures that coastal communities should take. Therefore, water temperature, salinity, and pH were continuously monitored with local high school students. A marked seasonal variation in water temperature and sharp decreases in salinity were observed in Otsuchi Bay. One possible factor contributing to the decreases in seawater salinity could be the inflow of seafloor spring water as well as rainwater. As for the high water temperatures detected during the monitoring period, one possible contributing factor was the inflow of warm water associated with the Kuroshio Meander, but continued monitoring is needed for a more accurate and quantitative assessment. As climate change progresses, the frequency and intensity of local extreme events such as storms and ocean heat waves will likely increase in coastal areas, and there are concerns about the combined effects of global warming and ocean acidification on a global scale, requiring the establishment of stable monitoring systems.

PROFILE

Masahiko Fujii is Professor of Atmosphere and Ocean Research Institute, the University of Tokyo, Japan. He has been involved in research and education on assessment, future projection, and mitigation and adaptation measures for the impacts of global warming, ocean acidification, and deoxygenation on coastal ecosystems and local societies. Recently, he has

also been investigating the impacts of ocean acidification on coastal ecosystems by examining in detail the marine environment of shallow-water CO2 seeps existing in the seas around Japan.

CHALLENGE 10 of OCEAN DECADE

Challenge 2 ハ**Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.;Challenge 5**Unlock Ocean-Based Solutions to Climate Change** - Advance research and solutions to address the ocean's role in mitigating climate change, including carbon storage, ocean renewable energy, and coastal protection.;Challenge ハ 6**Increase Community Resilience to Ocean Hazards**- Strengthen the ability of communities to prepare for, respond to, and recover from ocean-related hazards such as tsunamis, hurricanes, and sea-level rise.;Challenge 7**Expand the Global Ocean Observing System**- Enhance the global system for ocean observations, ensuring better data collection, sharing, and application to support science and decision-making.

S2-1

Research on the Impact of Fish Consumption Education Experience Courses on Nutritional Awareness, Dietary Behavior, and Consumption Behavior

CHEN, PIN-YAN(Master Student, National Taiwan Ocean Univeristy), Taiwan

ABSTRACT

As public health awareness rises, understanding nutrition and adopting healthy dietary behaviors become increasingly crucial. Aquatic foods serve as a significant global protein source, with their consumption also influencing environmental sustainability. This study investigates the effects of fish consumption education experience courses on nutritional awareness, healthy eating, and consumption behaviors among participants.

Employing a non-equivalent groups pretest-posttest quasi-experimental design, the research features an experimental group that participates in the fish consumption education course and a control group that does not. The course content integrates local fisheries characteristics and food education through six aspects, enhancing participants' understanding and support for healthy diets and fish products. This is achieved through explanations of fish nutrition, hands-on experiences, and sustainable consumption concepts.

Data analysis will utilize one-way ANCOVA, along with feedback gathered from learning sheets. The course design incorporates practical activities and real-life experiences, covering essential topics such as fish nutrition knowledge, proper purchasing methods, and healthy cooking practices.

The study collects data on participants' nutritional awareness, dietary habits, and consumption behavior through surveys and feedback from learning sheets. The aim is to understand how fish consumption education courses influence healthy eating behaviors among the public, thereby offering valuable insights for future curriculum design and educational promotion. The findings are expected to help assess the impact of these courses and serve as a reference for improving future educational programs.

PROFILE

Ms. CHEN, PIN-YAN graduated from the Department of Nutrition and Health Sciences at Chang Gung University of Science and Technology. Growing up near coastal sand dunes sparked her early interest in marine and seafood-related topics, leading to a strong interest in seafood education. To combine her nutrition background with education, she will begin graduate studies at the Institute of Education, National Taiwan Ocean University in July. She

hopes to strengthen her understanding of educational theory and curriculum design and apply it to seafood and nutrition education. With experience in nutrition research and volunteer service, she aims to promote public awareness of seafood nutrition and sustainable eating through integrated nutrition and marine education.

CHALLENGE 10 of OCEAN DECADE

Challenge 3**Sustainably Feed the Global Population**- Develop innovative and sustainable ways to use marine resources for food production, ensuring food security while maintaining healthy ecosystems.;Challenge1 **Understand and Beat Marine Pollution- Identify and eliminate sources of pollution in the ocean, including plastics, chemicals, and other pollutants, to protect marine ecosystems and human health.

S2-2

Infusing Marine Science into Current School Curriculums to Improve Ocean Literacy.

Sarah Taylor(Marine Science Manager, The Harbour School Hong Kong), Hong Kong

ABSTRACT

In Hong Kong, The Harbour School (THS) has proactively enhanced Ocean Literacy by establishing a Marine Science Center (MSC) that integrates ocean sciences into the curriculum through aquaria, research equipment, and a 50-foot wooden ketch serving as an "outdoor classroom." The Asia Pacific Region contributes nearly half of the world's fishery production, making the ocean and marine ecosystem health vital to millions. Consequently, there is a growing need to deepen ocean literacy and understanding of marine ecosystems among youth. This initiative evaluates the impact of a marine science facility and the incorporation of Ocean Literacy Principles across all grade levels to enrich learning.

Educators often face rigid curricula and lengthy processes to implement changes. However, THS has found a more effective approach to rapidly expand ocean literacy while adhering to curriculum standards. The MSC functions as an aquarium and laboratory dedicated to education and outreach, equipped with modern touch tanks and aquaria supported by a high-tech life support system that facilitates research.

THS has embedded ocean literacy education across all grades by linking it with one or more existing subjects and collaborating with teachers to develop cross-curricular lessons. Each term, students dedicate a week to projects or activities involving scientific observations and ocean studies. This approach has significantly increased students' engagement with marine life, environmental issues, and science overall. Improvements in science grades have been noted, alongside a rise in students expressing interest in scientific careers. Through its education and outreach efforts, the MSC offers students of all ages a scientific perspective on the world, fostering a deeper connection to the ocean and its ecosystems.

PROFILE

- Marine Science Manager / Lead Aquarist at The Harbour School Marine Science Center since 2017
- Operational Director at Ecological Marine Adventures in North Carolina USA
- BSc in Oceanography from University of Brighton (UK)

- Degree in Marine Technology from Cape Fear College (USA)

CHALLENGE 10 of OCEAN DECADE

Challenge1 **Understand and Beat Marine Pollution- Identify and eliminate sources of pollution in the ocean, including plastics, chemicals, and other pollutants, to protect marine ecosystems and human health.;Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.;Challenge 3**Sustainably Feed the Global Population**- Develop innovative and sustainable ways to use marine resources for food production, ensuring food security while maintaining healthy ecosystems.;Challenge 9**Skills, Knowledge, and Technology for All**- Build capacity, share knowledge, and transfer marine technology to ensure equitable access to ocean science, particularly for developing countries.;Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S2-3

Aquarium Practices in Marine Education and Ocean Literacy: A Case Study of Taichung Aquarium's "The Magical Journey of Little Pebble"

Wang Yangsheng (National Museum of Marin Biology and Assistant Manager, Aquarium BOT Hi scene World Enterprise Co., Ltd), Taiwan

ABSTRACT

The Taichung Aquarium, Taiwan's first social education facility operated under a local government led Operation and Transfer (OT) model, is managed by the private entity JADE SEA Co., Ltd. Responding to increasing societal expectations for marine conservation education, the aquarium has taken an active role in promoting ocean literacy. Prior to its official opening, the institution developed a specialized outreach program targeting remote schools in Taichung City. The curriculum, centered around a narrative-based picture book, guides students through Taiwan's ecological and marine environments via characters such as the Formosan landlocked salmon (Oncorhynchus masou formosanus), Indo-Pacific humpback dolphin (Sousa chinensis), and jellyfish. The program integrates interactive activities, including quizzes, jellyfish feeding, and tactile experiences to enhance students' understanding of marine biodiversity and the impacts of human activities. Reflective exercises are incorporated to foster critical thinking regarding human-nature coexistence. Through the combination of environmental education, conservation advocacy, and experiential learning, the Taichung Aquarium exemplifies a comprehensive model for marine education in social education facilities.

Keywords: marine education, ocean literacy, environmental education, Corporate Social Responsibility

PROFILE

WANG Yang-sheng
Assistant Manager / Hi Scene World Enterprise Co., Ltd.
Profile
Marine education advocate with over 15 years of practical experience promoting marine awareness across schools, communities on the Hengchun Peninsula, and various institutions. Committed to delivering educational content that goes beyond typical exhibition spaces.

Professional Experience

National Museum of Marine Biology & Aquarium BOT Hi Scene World Enterprise Co., Ltd. 2010-Present

1. Conducted over 800 on-site interpretation sessions in NMMBA
2. Training more than 100 interpreters in the NMMBA.
3. Designed and implemented diverse marine-themed courses since 2012, delivering 50+ campus sessions to over 6,000 students.
4. Organized the museum's "World Oceans Day" event from 2012, boosting public engagement with marine issues.
5. Consulter of Environment Education courses of Taichung Aquarium, since 2022.

Key Skills

☒ Marine education curriculum development

☒ Public interpretation and presentation

☒ Event planning and community outreach

CHALLENGE 10 of OCEAN DECADE

Challenge1 **Understand and Beat Marine Pollution- Identify and eliminate sources of pollution in the ocean, including plastics, chemicals, and other pollutants, to protect marine ecosystems and human health.;Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.;Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.

S2-4

Cultivating Ocean Literacy through Curriculum Innovation in Public Administration: A Case from Ocean University of China

Ruiqian Li, Ph.D.(Associate Professor,Ocean University of China), China

ABSTRACT

Since 2012, under the guidance of China's national strategies including "Maritime Power," "Coordinated Land-Sea Development," and "Developing marine economy, protecting marine ecological environment, and accelerating the construction of a maritime power," China's marine undertakings and marine education have developed rapidly. Chinese universities have advanced and innovated curriculum construction with the core of cultivating China's ocean literacy and the value orientation of "harmonious development between humanity and the sea."

Taking the curriculum of the public administration discipline at Ocean University of China as an example, this study analyzes issues in previous courses, such as insufficient interdisciplinary integration in cultivating ocean literacy competencies, barriers between teaching and research, and limitations of traditional teaching methods. It introduces innovative curriculum practices in terms of objectives, content, methods, and assessment:①Aiming to enhance two key ocean literacy competencies—scientific exploration and ecological sharing. ②Constructing interdisciplinary content across "nature-institution-culture" dimensions. ③Supplemented by in-class resource banks (case studies, literature, policies, and exercises) and extracurricular platforms (skills competitions, academic conferences, and internship bases). ④Employing AI technologies to empower teaching, improving course engagement. These innovations address disciplinary gaps and leverage technological integration, providing a practical model for cultivating ocean literacy in non-marine technical/STEM disciplines.

PROFILE

Ruiqian Li is an Associate Professor at Ocean University of China. She received her Ph.D from University of Groningen in 2017 and is affiliated with the Administrative Management Group and Land Resource Management Group at the School of International Affairs and Public Administration. Her research focus is marine spatial planning and coastal spatial governance, particularly with regards to the institutional evaluation and spatial governance improvement by integrating ecological thinking and resilient thinking. She has also conducted

research on the evaluation of coastal land use quality by using the qualitative and quantitative evaluation methods. Her work has been published in the Land Use Policy, Marine Policy, Ocean & Coastal Management, Ecosystem Services, Acta Ecologica Sinica, Resources Science and Acta Geographica Sinica among other academic journals. Her teaching work involves Marine Spatial Planning and Management, Marine Resource Management, Qualitative Methods, and Environmental Policy and Management.

CHALLENGE 10 of OCEAN DECADE

Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.;Challenge 9**Skills, Knowledge, and Technology for All**- Build capacity, share knowledge, and transfer marine technology to ensure equitable access to ocean science, particularly for developing countries.;Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S2-E

Expanding ocean observing system with affordable, customisable and open-source ocean buoy

Wee Cheah, Ph.D.(Senior Lecturer, Universiti Malaya), Malaysia

ABSTRACT

Malaysia, with approximately 4,800 km of coastline and located within the Indo-Pacific Warm Pool, is a global marine biodiversity hotspot. However, its rich marine ecosystems are increasingly threatened by climate change and human activities. A major limitation in understanding and managing these impacts is the lack of long-term in situ ocean observations, particularly essential variables such as seawater temperature, ocean currents, and wave dynamics. High costs and limited accessibility of conventional oceanographic instruments remain significant barriers to sustained ocean monitoring in the region. To address this gap, we have developed an affordable, open-source, and highly customisable ocean buoy inspired by the OpenMetBuoy concept. Our buoy integrates a range of sensors, including GPS, temperature, significant wave height, and PAR. A key feature of our buoy is the real time data transmission via WiFi, 5G mobile network, or satellite, depending on deployment needs. The system includes cloud-based data storage, flexible data visualisation via web browsers, and a built-in notification system to alert users of operational issues. With a cost ranging from USD 200 to 1,000, this platform offers a scalable and accessible solution for expanding Malaysia's ocean capacity and is ideal for hands-on learning and classroom demonstration.

PROFILE

Dr.Wee Cheah is a Senior Lecturer and Head of Earth Observation and Climate Change Unit at the Institute of Ocean and Earth Sciences, Universiti Malaya. He holds a PhD in Oceanography from the University of Tasmania, funded by the Australian Government's Antarctic Climate & Ecosystems CRC. He completed six years of postdoctoral research serving at the Alfred Wegener Institute (AWI) Helmholtz Centre for Polar and Marine Research (Germany) and Academia Sinica (Taiwan), supported by the Academia Sinica Postdoctoral Fellowship. He was awarded Best Oral Presentation (Asia Region) at the 2016 SCAR Open Science Conference and was the first Malaysian to be appointed as a co-opted member of the Executive Committee of the Scientific Committee on Oceanic Research (SCOR). He helped establish and currently chair of SCOR Malaysia, and serve on the steering committee of ECOP Malaysia. My research focuses on ocean-atmosphere interactions and their influences on

marine ecosystems, using field observations, satellite remote sensing, and numerical modelling. He is currently developing a low-cost ocean buoy for deployment in Malaysian waters.

CHALLENGE 10 of OCEAN DECADE

Challenge 7**Expand the Global Ocean Observing System**- Enhance the global system for ocean observations, ensuring better data collection, sharing, and application to support science and decision-making.

S3-1

BLUE-CLASSROOM: BUILDING CROSS-NATIONAL OCEAN LITERACY MODULES THROUGH LOCAL SPECIES AND STUDENT ACTION

Ensephabolia Syabaniyah Asiadi, Ryosuke Kitano, Toshihiko Hatai(Master student, Tokyo University of Marine Science and Technology), Indonesia, Japan

ABSTRACT

Ocean literacy is a foundational tool to cultivate an informed, responsible generation in facing marine challenges. This study presents a transnational collaboration between young researchers from Indonesia and Japan to design an interdisciplinary education model that leverages local marine species as educational entry points. We propose a comparative framework to develop elementary school learning modules focused on three case studies: (1) the whale shark (Rhincodon typus) conservation narrative in Saleh Bay, Indonesia, as a means of introducing marine megafauna, traditional ecological knowledge, and ocean stewardship; (2) aquaculture innovation in sustainable fish feed in Japan, adapted into classroom scenarios that blend marine science with social studies; and (3) environmental education initiatives involving active participation in marine conservation activities, focusing on macrofauna and community engagement in Tokyo Bay and Zushi. This species-based educational model aims to integrate ocean literacy principles with localized content, thereby enhancing relevance and student engagement. It further explores how narrative storytelling, experiential observation, and cultural values can be harmonized across borders to support the Ocean Decade's goals. We offer a preliminary educational toolkit and framework for bilateral collaboration between schools in both countries. This project exemplifies how grassroots academic cooperation can contribute to advancing foundational ocean literacy and inspire interdisciplinary learning from the ocean.

Keywords: Ocean literacy, whale shark, aquaculture, environmental education, cross-national collaboration.

PROFILE

Ensephabolia Sya'baniyah Asiadi is a first-year Master's student of Marine Science from Indonesia, currently studying at IPB University and participating in an academic exchange program at Tokyo University of Marine Science and Technology. She has a strong background

and extensive experience in the fields of environmental science and education.

Ryosuke Kitano is affiliated with the Department of Ocean Policy and Culture, bringing insights into the sociocultural dimensions of marine science, particularly in relation to ocean education and interdisciplinary collaboration.

Toshihiko Hatai is a first-year Master's student of TUMSAT. He was an elementary school teacher in Kanagawa prefecture. He studies Environmental education to revaluate our way of life. At school, he was interested in science education and environmental education. And put them into practice. In the local area, he was also involved in environmental protection.

CHALLENGE 10 of OCEAN DECADE

Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.;Challenge 3**Sustainably Feed the Global Population**- Develop innovative and sustainable ways to use marine resources for food production, ensuring food security while maintaining healthy ecosystems.;Challenge 4**Develop a Sustainable Ocean Economy** - Promote sustainable economic activities in the ocean, such as fisheries, renewable energy, and tourism, while minimizing environmental impacts.;Challenge 9**Skills, Knowledge, and Technology for All**- Build capacity, share knowledge, and transfer marine technology to ensure equitable access to ocean science, particularly for developing countries.;Challenge 10**Change Humanity’s Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S3-2

Technical Development of Net Cages for Juvenile Bigeye Tuna Acclimation and Farming and Educationing

Chen Dajie, Duan Zhiyue, Fukumoto Kazuma(Master student, Tokyo University of Marine Science and Technology), China,Japan

ABSTRACT

This study aims to develop a specialized offshore net cage system for juvenile bigeye tuna (Thunnus obesus), addressing the challenges posed by their fast swimming behavior, strong stress response, and reliance on wild-caught juveniles. Current sea cages often result in collisions, escapes, and high mortality, limiting the potential for sustainable aquaculture.

The proposed cage design focuses on structural stability, environmental adaptability, and behavioral compatibility. It also integrates environmental monitoring and feeding systems to improve operational efficiency and long-term viability, contributing to a scalable model for bigeye tuna aquaculture.

In addition to the engineering focus, this project includes an educational component that promotes ocean literacy. The Integrated Tuna Aquaculture Education Program combines on-site visits, research-based learning, and hands-on experiences. It targets students from middle school to university level and encourages collaboration with local fisheries and academic institutions.

This research aligns with Challenge 10 of the UN Decade of Ocean Science for Sustainable Development, aiming to restore humanity's relationship with the ocean through both technological innovation and education.

PROFILE

Fukumoto Kazuma

I am currently conducting research in the Laboratory of Aquatic Environmental Education, where I focus on promoting marine education through the development of educational tools. My main project involves designing a board game based on the principles of ocean literacy. By integrating key ocean concepts into interactive gameplay, I seek to foster awareness and understanding of marine environments and sustainability. This interdisciplinary approach

combines environmental science, pedagogy, and game design to support the goals of the UN Ocean Decade, particularly in reconnecting people with the ocean.

CHALLENGE 10 of OCEAN DECADE

Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.;Challenge 4**Develop a Sustainable Ocean Economy** - Promote sustainable economic activities in the ocean, such as fisheries, renewable energy, and tourism, while minimizing environmental impacts.;Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S3-3

Impact of inadequate policy frameworks to sustainable utilization of Ocean resources

Simon Losepicho Clementinah and Takafoin Bradley (Master student, Tokyo University of Marine Science and Technology), Kenya and Papua New Guinea

ABSTRACT

The Global agenda of the UN Ocean decade recommends to policy makers at national and international levels that by 2030, comprehensive policies and governance frameworks such as sustainable ocean plans are implemented, promoting sustainable management of ocean resources, and ensuring equitable access and benefits distribution among all stakeholders, particularly marginalized and indigenous communities.

Governments play a pivotal role in shaping ocean policies and regulations, necessitating effective governance structures and policy frameworks and thereby creating a supportive, enabling, and equitable environment for public and private sector finance and investment in the sustainable development of the sector. These policies should ensure that the multiple values and services of the ocean for human wellbeing, culture, and sustainable development are widely understood, that society-ocean connections are strengthened, and that there is increased motivation, capability, and opportunity for people across all sectors of society, to make decisions and behave in ways that ensure a healthy ocean.

However, majority of developing nations have been found to either lack or have inadequate clear policies frameworks targeting the development of the ocean economy. In other instances, several government institutions have policies that are conflicting or overlapping therefore impeding or slowing down the implementation of developmental interventions for the utilization of the ocean resources. Therefore, there is a need for a multisectoral collaborative approach among the different key actors for the development of an effective and inclusive policy to cater for the sustainable development and utilization of ocean resources.

Additionally, during the development and implementation of key ocean related policies and governance frameworks, it's critical for all stakeholders to be engaged in the entire process. Historically, we have communities that have been living along the ocean and using ocean resources for their livelihoods. However, these communities are usually left out during the development of policies that guide the sustainable utilization of ocean resources. Therefore, it's recommended that there should be enhanced collaboration and engagement among stakeholders ensuring equitable benefit sharing while acknowledging and prioritizing the

culture, identity, and rights of these indigenous communities that have historically depended on and thrived alongside ocean resources.

PROFILE

1.Name: Simon Losepicho Clementinah

Country: Kenya

Status : Graduate student pursuing a Master's Degree in Marine Policy and Management at the Tokyo

University of Marine Science and Technology

2. Name: Takafoin Bradley

Country: Papua New Guinea

Status: Graduate Student (Master 1), 2025 at Tokyo University of Marine Science and Technology.

Major: Marine Policy and Management

CHALLENGE 10 of OCEAN DECADE

Challenge 4**Develop a Sustainable Ocean Economy** - Promote sustainable economic activities in the ocean, such as fisheries, renewable energy, and tourism, while minimizing environmental impacts.;Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S3-E

Developing the "Aquaponics STEAM Program" : For aiming to foster a deeper understanding of the interconnectedness of food systems and marine conservation

Tsuyoshi Sasaki, Ph.D.(Professor, Tokyo University of Marine Science and Technology), Japan

ABSTRACT

Proposed solutions to Ocean-related issues are linked to social values, environmental behavior, and marine governance, all of which necessitate individuals to possess Ocean Literacy (OL). The different frameworks and approaches to OL have been proposed. However, this diversity can cause ambiguity and complexity, and a comprehensive synthesis of the progress made is needed. Therefore, it is essential to provide specific examples that illustrate the relationship between OL and particular fields. This study examines an Aquaponics STEAM Program that cultivates plants and fish in a sustainable circular model for middle school students aged 13-14, aiming to enhance scientific inquiry skills and relational values (RVs) related to the OL components based on the theory of change. Results show significant differences in scientific inquiry skills between Group A, engaged in aquaponics activities, and Group B, which was not. Pre-survey analyses revealed a conflation of intrinsic and instrumental values, while post-survey results indicated that Group A could distinguish RVs, instrumental values, and intrinsic values, suggesting that hands-on experiences fostered this differentiation. Aquaponics activities can effectively cultivate OL frameworks and competencies aligned with school curriculum goals.

PROFILE

Tsuyoshi Sasaki, Ph.D., is professor at the Tokyo University of Marine Science and Technology, where he is dedicated to advancing marine education and fostering international collaboration. His career in education began in 1990 as a high school teacher at Iwate Prefectural Miyako Fisheries High School. In 2006, he joined Tokyo University of Marine Science and Technology as an Associate Professor and became a member of the National Marine Educators Association at the same year. A recognized leader in marine education across Asia, Dr. Sasaki has served as President of the Aquatic Marine Environmental Educators Association since 2012 and the Asia Marine Educators Association since 2015. He was promoted to Professor in 2018. In 2023, he played a key role in establishing the Ocean

Town Community School, a pioneering initiative to integrate Ocean Literacy into community-based learning.

CHALLENGE 10 of OCEAN DECADE

Challenge 3**Sustainably Feed the Global Population**- Develop innovative and sustainable ways to use marine resources for food production, ensuring food security while maintaining healthy ecosystems.;Challenge1 **Understand and Beat Marine Pollution- Identify and eliminate sources of pollution in the ocean, including plastics, chemicals, and other pollutants, to protect marine ecosystems and human health.

S4-1

SPARK the Future of Education for Sustainable Development: Building Educators' Capacity on Designing Interdisciplinary Curriculum and Cross-Sector Partnerships in Schools

Wendy Wu & Blaire Ho(Programme Leader and Programme Officer of Ednovators),
Hong Kong, China

ABSTRACT

SPARK the Future of Education for Sustainable Development is a Hong Kong-based programme led by Ednovators that aims to strengthen the capacity of primary and secondary school educators to design and implement interdisciplinary curricula focused on education for sustainable development (ESD) and SDG 14: Life Below Water. Recognizing the critical role of teachers in shaping sustainable mindsets, SPARK empowers educators through professional development, collaborative design processes, and hands-on support to localize education for sustainable development within their own school contexts. As part of this work, Ednovators aims to create experiential learning opportunities that engage students' Head (intellectual understanding), Heart (emotional intelligence), and Hands (practical implementation). This holistic approach is designed to deepen students' awareness of sustainable development, nurture global citizenship, and enhance their readiness to respond to marine threats in their communities and beyond.

The programme, running from 2024 to 2026, also fosters cross-sector partnerships between schools, marine experts, and education for sustainable development focused organizations. These partnerships enrich curriculum development and provide real-world relevance and scientific grounding for student learning. By facilitating long-term collaboration between educators and the marine science community, SPARK supports the co-creation of school-based initiatives that connect students with ocean-related challenges through project-based learning.

This presentation will share the SPARK programme's approach, progress, and early outcomes from its first cycle of implementation. It will highlight how interdisciplinary learning, teacher leadership, and external partnerships can work together to advance ESD in formal education systems.

PROFILE

As the Programme Lead at Ednovators, a Hong Kong-based charity dedicated to transforming education, Wendy Wu is a dedicated contributor of educational innovation in Hong Kong. Since 2017, she has empowered over 300 educators from more than 100 schools, fostering new pedagogical approaches within the elementary, secondary & special school context.

From 2024 on, Wendy leads the "Spark the Future of Education for Sustainable Development" initiative. This forward-thinking program cultivates crucial collaborations between teachers and NGOs for developing interdisciplinary curriculum centered on Sustainable Development Goal 14: Life Below Water. This involves developing educational strategies to conserve and sustainably utilize the oceans, seas, and marine resources, as well as an advanced practice of ESD in traditional school context.

Meanwhile, Blaire Ho is the Programme Officer at Ednovators and plays a key role in the design and delivery of the SPARK initiative. With a Master of Climate Change from the University of Waterloo, Blaire brings a global perspective and technical expertise in climate adaptation, climate justice, and education for sustainability. Her work focuses on creating experiential learning opportunities that empower both teachers and students to respond meaningfully to the climate emergency.

In addition to her role at Ednovators, Blaire is an inaugural member of the Northeast Asian Youth Climate Council, established under the United Nations Department of Political and Peacebuilding Affairs. Blaire is dedicated to bridge grassroots education efforts with global climate advocacy and empowerment, helping to promote Hong Kong's education system as a driving force for sustainability, equity, and resilience in the Asia-Pacific region.

CHALLENGE 10 of OCEAN DECADE

Challenge1 **Understand and Beat Marine Pollution- Identify and eliminate sources of pollution in the ocean, including plastics, chemicals, and other pollutants, to protect marine ecosystems and human health.;Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.;Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S4-2

Exploring the concept of Speciesism in academic marine education

Ninja Mueller (PhD.student, University of Vechta), Germany

ABSTRACT

The Ocean is crucial for a healthy planetary ecosystem, however, throughout the last decades, the commodification of the Ocean for human use led to a polluted and overexploited marine ecosystem. Frameworks to systematically ensure a sustainable use of the Ocean have been deployed, such as the UN Sustainable Development Goals or the UN Ocean Decade. While Challenge number 10, to restore society's relationship with the Ocean, calls for taking new perspectives and responsible human-Ocean-interaction, the prevalent paradigm in sustainable marine development and education remains human-centred. However, in order to change society's relationship with the Ocean, the anthropocentric lens of instrumentalising the Ocean and its inhabitants, and defining the Ocean's value based on its utility for humanity needs to change too. Therefore, the concept of Speciesism as an underlying paradigm representing the justification of a commodification of marine animals is an important aspect to address when exploring the restoration of society's relationship with the Ocean and tackle the last of the UN Ocean Decade's challenges.

Marine animals are disadvantaged on an intersectional level of Speciesism and terrestrialism, making them particularly vulnerable for systematic anthropogenic exploitation. One possible path to address marine speciesism on a broad scale is the incorporation of critical marine animal studies in academic marine education.

In this research project, the role of marine animals in human society, and the resulting human-Ocean-relationship are explored and discussed. Furthermore, the incorporation of the concepts of speciesism and critical animal studies in academic marine education as possible approaches to restore society's relationship with the Ocean are investigated. A special focus lies on the role of marine education programmes as strong levers to impact the understanding and mind-sets of tomorrow's marine decision-makers who will shape future marine developments.

PROFILE

Ninja Mueller is a PhD student at the University of Vechta, Germany, investigating decolonising the marine curriculum and applying a critical Ocean pedagogy at the intersection of Ocean Literacy and critical animal studies. Ninja holds a M.Sc. in marine biological resources, a M.Sc. in education for sustainable development, and a B.Sc. in environmental sciences. During her first master's, she co-founded the XR production company Cyan Planet, creating immersive media experiences for marine protection in collaboration with marine NGOs. Currently, she teaches sustainability management at Leuphana University, Germany, and leads the development of a school community focusing on education for sustainable development. Furthermore, she is a member of the Asian Marine Educators Association (AMEA) Youth Board and member of the Critical Animal Studies group of Gothenburg University (GU-CAS).

CHALLENGE 10 of OCEAN DECADE

Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S4-3

Bridging Sectors for Ocean Sustainability: A School-Based Seaweed Initiative as a Model for Cross-Sector Collaboration

Carlos Rius Errando(Marine Science Center Specialist, The Harbour School Hong Kong), Hong Kong

ABSTRACT

This presentation showcases a Hong Kong secondary school's Ulva lactuca seaweed farming initiative as a model for multidisciplinary collaboration in support of the UN Ocean Decade's goals. By bringing together educators, students, marine scientists, and fish farmers, the project illustrates how cross-sector partnerships can turn isolated efforts into scalable, impactful solutions. Students designed and built seaweed rafts using recycled materials, deploying them by boat after gaining hands-on knowledge of seaweed biology. Once in place, high school students led experiments on biomass growth, nutrient uptake, and carbon sequestration, while also conducting biodiversity surveys that revealed juvenile fish and invertebrates thriving on the rafts. Collaboration with local fish farms enhanced sustainable aquaculture practices, as farmers contributed traditional ecological knowledge that students validated through fieldwork. Through this process, students saw firsthand how small-scale actions—like deploying a single 1 m^2 raft—can help mitigate climate change (via CO_2 absorption), reduce water pollution (through nutrient filtration), and create vital nursery habitats for marine life within just a few months. Students emerged as "knowledge ambassadors," connecting sectors and raising awareness—exemplified by one student's independent study project, which educated peers on the ecological value of seaweed through school-wide campaigns. This initiative directly contributes to Ocean Decade Challenges 2 (sustainable seafood) and 10 (transforming humanity's relationship with the ocean), with the aim of inspiring other schools locally and internationally.

PROFILE

Carlos Rius Errando is a marine biologist with a BSc in Biology and an MSc in Nature Management, specializing in seaweed ecology, marine invertebrates, and conservation. His work integrates scientific research, environmental action, and education, with a strong emphasis on sustainable marine practices and experiential learning. He currently works at a school in Hong Kong where ocean literacy is embedded in the curriculum for all ages. He

teaches marine science across all grade levels and serve as the aquarist for our Marine Science Center, where he cares for a diverse range of marine life—from corals and seaweeds to stingrays and reef fish. This hands-on environment allows students to learn directly from living systems and develop a deeper connection with the ocean. Through international fieldwork, mentorship, and community collaboration, he helps students and stakeholders engage with marine ecosystems beyond textbooks—blending science with storytelling, diving, and underwater photography. Passionate about ocean stewardship, he collaborates with local fish farms and environmental startups to highlight the ecological and economic value of marine resources. Driven by curiosity and a commitment to ocean health, he believes science flourishes when paired with adventure, creativity, and real-world impact.

CHALLENGE 10 of OCEAN DECADE

Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.;Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.;Challenge 3**Sustainably Feed the Global Population**- Develop innovative and sustainable ways to use marine resources for food production, ensuring food security while maintaining healthy ecosystems.;Challenge1 **Understand and Beat Marine Pollution- Identify and eliminate sources of pollution in the ocean, including plastics, chemicals, and other pollutants, to protect marine ecosystems and human health.;Challenge 5**Unlock Ocean-Based Solutions to Climate Change** - Advance research and solutions to address the ocean's role in mitigating climate change, including carbon storage, ocean renewable energy, and coastal protection.

S4-4

“From Tentacles to Tomorrow: Promoting Sustainable Fisheries Education through Octopus Narratives"

Hani Nusantari (Program Manager, Yayasan Juang Laut Lestari (JARI)), Indonesia

ABSTRACT

Octopus are fascinating creatures, known for their intelligence, rapid growth, and unique biology. They are not only ecologically significant but also deeply tied to the livelihoods of many coastal communities. However, octopus population are under threat due to overfishing, mismanagement and environmental change.

Sustainable fisheries education with a focus on octopus as biological, cultural and sustainable symbol is very important to enhance understanding among children – particularly those schools located in coastal areas where fishing is a way of life. Educational materials particularly children’s book and community-based literature can serve as powerful tool to connect children with marine science and sustainable resources management.
“Guri, The Octopus” is written to educate the children about biology of octopus and “Pelita, The Octopus Fishermen Brotherhood” is designed to present fishermen life and sustainable fishing practices. That information is in engaging, age-appropriate way, blending scientific facts with storytelling in local wisdom and traditions.

By integrating local ecological knowledge, fishing practices, and cultural values into those books, it will equip children with knowledge and understanding to take pride in and protect their marine environment.

PROFILE

Hani Nusantari is a co-founder of Yayasan Juang Laut Lestari (JARI). Passionate and result-driven person with strong background and marine education and conservation. Proven expertise in developing and leading environmental education program, community outreach and sustainable marine resources management. Skilled in marine educational resources development, children book writing, stakeholders’ collaboration and project implementation. Dedicated to advancing marine biodiversity protection and sustainable resource management.

CHALLENGE 10 of OCEAN DECADE

Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S4-E

Between Air and Sea: Divergent Nasal Evolution in Toothed and Baleen Whales

Ayumi Hirose, Ph.D.(JSPS Researcher, Institute of Science Tokyo), Japan

ABSTRACT

This presentation focuses on the research on cetacean nose including our studies from Japan. Whales, dolphins, and porpoises are popular in Japan. The country's wide range of climate—from subtropical to subarctic regions—and its geography surrounded by the ocean supported richness in marine biodiversity. Marine mammals are no exception. Around 40 species of cetaceans, nearly half of all species found worldwide, inhabit the waters around Japan. It is therefore not surprising that the Japanese people have developed a deep connection with these animals.

The structure of the cetacean nose reflects their adaptation to an aquatic lifestyle. Toothed whales and baleen whales have followed different evolutionary paths, resulting in notable differences in nasal anatomy. The nasal complex of toothed whales has been extensively modified compared to their terrestrial ancestors. For instance, they possess specialized nasal sacs within the nasal cavity, which are essential for sound production and play a critical role in their sophisticated echolocation system. In contrast, baleen whales retain nasal features more similar to those of terrestrial mammals. Their sounds are produced in the throat, as in most of other mammals, but they also possess a unique structure known as the laryngeal sac, which may enhance the resonance or quality of their vocalizations.

Interestingly, while toothed whales have lost their sense of smell—likely as a trade-off for echolocation—baleen whales still retain this sensory ability. In my research, I investigated the nasal mucosa of common minke whales (Balaenoptera acutorostrata) to better understand this function. Through histological and gene expression analyses, I found that the mucosa shows features resembling olfactory epithelium, and genes related to smell were locally expressed. This work bridges anatomical and genomic approaches to better understand the sense of smell in baleen whales.

PROFILE

Ayumi Hirose is a Japan Society for the Promotion of Science (JSPS) researcher at Institute of Science Tokyo, investigating sense of smell in cetaceans through both morphological and

genomic approaches. She hold a Ph.D. in ocean science from Tokyo University of Marine Science and Technology, and have employed various approaches to investigate this lineage, including vessel-based sighting surveys, morphological measurements and skeletal specimen preparation. These experiences have fostered me a vivid appreciation of cetaceans as living aquatic mammal. She is skilled in dissection, histology, and transcriptomic analysis. She is passionate about exploring the evolutionary history of cetaceans, unique mammals that have remarkably adapted from life on land to a fully aquatic existence.

CHALLENGE 10 of OCEAN DECADE

Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.;Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S5-1

Enhancing Marine Conservation Awareness: Evaluating High School Students' Comprehension of Sustainability Concepts

Chiao-Wei Tseng (Master Student, National Taiwan Ocean Univeristy), Taiwan

ABSTRACT

This study evaluates the understanding of marine resource conservation and sustainability among Taiwanese high school students by developing the Chinese Marine Resources Conservation and Sustainability Scale (CMRCSC-H). Anchored in the cognitive, socio-emotional, and behavioral learning objectives outlined in UNESCO's Education for Sustainable Development Goals (ESDGs), this scale is specifically designed for students aged 16 to 18. It aims to investigate gender differences in marine knowledge and conservation concepts. The scale consists of 31 items organized into four dimensions: the first dimension assesses marine knowledge through 10 multiple-choice questions, while the other three dimensions employ a four-point Likert scale to evaluate cognitive, socio-emotional, and behavioral learning objectives with 10, 6, and 5 items, respectively. A total of 582 valid responses were collected for analysis. The findings reveal that the scale exhibits strong reliability and validity, with female students outperforming their male counterparts in socio-emotional and behavioral learning objectives. This newly developed scale serves as a reliable instrument for assessing students' comprehension of marine knowledge and conservation concepts, which are crucial for effectively addressing contemporary marine environmental challenges and fostering a sustainable future.

PROFILE

Name: Chiao-Wei Tseng
Gender: Female
School: National Taiwan Ocean University
Department: Graduate Institute of Education

CHALLENGE 10 of OCEAN DECADE

Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S5-2

Ocean education through simple scientific hydrodynamic experiments in elementary and junior high school classes

Yoshihiro Niwa, Ph.D. (Researcher, International Polar and Earth Environmental Research Center, National of Institute of Polar Research), Japan

ABSTRACT

In Japan's elementary and junior high schools, ocean education is conducted mainly in social studies rather than science classes. As a result, students tend to only memorize facts about the ocean passively without developing scientific understanding. To introduce a scientific perspective into ocean education, we conducted simple hydrodynamic experiments aligned with the Japanese Courses of Study for Science, aiming to help students actively think and understand the fundamental mechanisms of the ocean system. This presentation reports on several examples of classroom activities using these experiments, which were conducted in elementary and junior high schools in Kesennuma City of Miyagi Prefecture, located on the Sanriku coast in northeastern Japan. We addressed the following themes in these classroom activities: (1) the rich biological productivity of the Sanriku coastal sea, (2) global warming and its effect on the ocean, and (3) the travel time of tsunami waves reaching the Sanriku coast.

PROFILE

Yoshihiro Niwa

Current Affiliation: International Polar and Earth Environmental Research Center, National Institute of Polar Research

Educational and Professional Experience

•1998: Ph.D. (Science) Physical Oceanography, Hokkaido University

•2002–2011: Department of Earth and Planetary Science, Graduate School of Science, The University of Tokyo

•2011–2016: Research Center for Marine Education, Ocean Alliance, The University of Tokyo

•2016–2019: Mega Tsunami Project, Ocean Alliance, The University of Tokyo

•2019–2022: Center for Ocean Literacy Education, Graduate School of Education, The University of Tokyo

•2022–present: International Polar and Earth Environmental Research Center, National Institute of Polar Research

CHALLENGE 10 of OCEAN DECADE

Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S5-3

Green Leaders: Empowering Youth from Landlocked Regions for Ocean and Climate Action

Charu G (Director, EnviroVision2050), India

ABSTRACT

The Green Leaders Programme by EnviroVision2050 is a youth-driven initiative endorsed by the UN Ocean Decade, designed to empower young changemakers—especially those in landlocked and underserved areas—to take meaningful action for ocean and climate health. Recognizing that environmental education often overlooks inland communities, the program bridges this gap through an innovative, transdisciplinary model that blends science, art, advocacy, and hands-on restoration work.

Through a mix of workshops, field projects, research, and creative campaigns, youth explore critical environmental challenges and co-create localized solutions. The programme nurtures leadership, communication, and collaboration skills, enabling youth to transform knowledge into impact. Participants have conducted wetland restoration, led plastic audits, presented at international conferences, and engaged thousands through awareness events, demonstrating how inland youth can contribute to ocean literacy and sustainability.

Our work shows that contextualizing ocean issues and providing platforms for expression—such as art, technology, and storytelling—leads to deeper engagement and sustained action. A core lesson learned is the value of peer leadership and community-driven models, which foster ownership and build capacity from the ground up. By connecting youth to global challenges through local relevance, Green Leaders not only shifts perspectives but also shapes the next generation of environmental leaders ready to act for a healthier planet.

PROFILE

Charu is an environmental enthusiast, a certified NATGEO educator, and curator of EnviroVision2050. She has worked as a policy advocacy & media strategist, with over 15 years of experience in sectors across govt, corporates, NGOs & international organizations. She is passionate about bringing about a tangible change in the environment and to leave this planet as a better place for next generations.

CHALLENGE 10 of OCEAN DECADE

Challenge1 **Understand and Beat Marine Pollution- Identify and eliminate sources of pollution in the ocean, including plastics, chemicals, and other pollutants, to protect marine ecosystems and human health.

S5-4

The Construction of China's Marine Education System: Connotations, Challenges, and Realization

LIU XUNHUA, Ph.D. (Professor,Marine Education Research Center of Ningbo University), CHINA

ABSTRACT

The Chinese marine education system is a general term for all kinds of marine education practice activities at all levels in our country. The construction of this system is of great significance for comprehensively improving marine literacy and skills in the new era. It plays a positive role in bridging the gap in marine literacy between China and foreign countries and promoting the transformation and upgrading of marine education.

The construction of the system is manifested in five major connotations: the combined efforts of "school marine education, social marine education, and family marine education" in terms of content; the progressive development of "basic marine education, professional marine education, and marine science and technology education" at different levels; the multi-dimensional coordination of "marine cultural education, marine economic education, and marine ecological education" in terms of scope; the systematic cultivation of people across "kindergartens, primary schools, middle schools, universities, and society" among the audiences; and the collaborative mechanism of "government leadership, social participation, expert guidance, school hosting, and citizen support" in terms of guarantee. The aim is to enhance the marine literacy of the public and cultivate marine talents.The construction of the Chinese marine education system reflects the top-down top-level design and the bottom-up practical promotion, and achieves strategic implementation in aspects such as culture, technology, and mechanism. Currently, there are some bottlenecks in the construction of the system. The primary issues in promoting marine education practice are related to culture, ideology, and concepts, involving marine philosophy, marine thinking, and values, etc. It is necessary to actively build a vertical cycle covering kindergartens, primary schools, middle schools, universities, and society and a horizontal cycle with content as the core. Technologically, it is required to coordinate marine data and artificial intelligence to achieve the interconnection of marine education technologies. In terms of organizational construction, the realization of literacy, especially talent cultivation, relevant mechanism guarantees should be established.

PROFILE

Liu Xunhua is a Doctor of History and a Postdoctoral Fellow in Education. He currently serves as Executive Vice President of the National Marine Education Research Alliance, Director of the Education Supervision and Teaching Evaluation Center at Ningbo University, Director of the Marine Education Research Center, Professor and Doctoral Supervisor at the College of Teacher Education, and Editor-in-Chief of the journal Marine Education Research. As the chief expert of a key research project of the Ministry of Education's Philosophy and Social Sciences Research, he has long been dedicated to marine education research and is an active advocate for constructing the disciplinary system of "marine pedagogy". He has presided over more than 40 research projects, published over 100 academic papers in journals such as Educational Research, and authored six academic monographs. He has won the first prize and Youth Award of the Ministry of Education's University Scientific Research Achievements Award, as well as the second and third prizes of the Zhejiang Provincial Philosophy and Social Sciences Excellent Achievements Award. He proposed new concepts such as "national marine education" and "Chinese marine literacy", and took the lead in establishing Introduction to Marine Education, the first undergraduate general education course on marine education in Chinese universities.

CHALLENGE 10 of OCEAN DECADE

Challenge 5**Unlock Ocean-Based Solutions to Climate Change** - Advance research and solutions to address the ocean's role in mitigating climate change, including carbon storage, ocean renewable energy, and coastal protection.

S5-E

Waves of Identity: A Multilevel Study on the Effects of the Ocean Science Sequence Curriculum on Teachers' and Students' Ocean Identity and Students' Ocean Science Learning Outcomes

Chia-Dai (Ray) Yen, Ph.D. (Associate Professor,National Taiwan Ocean Univeristy), Taiwan

ABSTRACT

Since 2018, the United Nations' emphasis on ocean literacy has spurred global efforts toward sustainable ocean development. In the United States, the National Marine Educators Association identified a lack of structured marine education in 2002, leading to the release of the Ocean Literacy Framework and Scope and Sequence in 2010. Building upon this, the University of California, Berkeley's Lawrence Hall of Science developed the Ocean Sciences Sequence (OSS), now a globally recognized curriculum. Taiwan initiated marine education policies in 2007 and 2017 but lacked a systematic curriculum until the National Academy of Marine Research (NAMR) secured authorization to implement OSS in 2022. While OSS fills critical policy gaps, its impacts on students' learning outcomes and teachers' ocean identity require further investigation. This two-year study will examine three elementary schools and three junior high schools in Keelung, involving a total of 647 students across Grades 6 and 7. Through mixed-methods research, we aim to assess the effects of OSS 3-5 and OSS 6-8 modules on participants' ocean identity and science learning. Findings will inform the advancement of ocean literacy policies in Taiwan and contribute to international research on effective ocean education practices.

PROFILE

Dr. Chia-Dai(Ray) Yen is the Director of the Center for Integrated Planning and Training at the National Academy of Marine Research (NAMR) and an Associate Professor at National Taiwan Ocean University. She earned her Ph.D. in Human Resource Management from National Central University and her M.A. in Tourism Management from Chinese Culture University. Dr. Yen serves as Secretary-General of the Asia Marine Educators Association and Convener of the Talent Development Committee of the Taiwan International Cruise Association. Her research focuses on marine education, professional talent development, and human resource management. She has led national projects on marine and energy education and mentors students in regional revitalization and entrepreneurship, achieving outstanding

results in national competitions.

CHALLENGE 10 of OCEAN DECADE

Challenge 5**Unlock Ocean-Based Solutions to Climate Change** - Advance research and solutions to address the ocean's role in mitigating climate change, including carbon storage, ocean renewable energy, and coastal protection.;Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.

S6-1

Advancing Marine Education Through Self-Funded Nature Education Initiatives

Mo Chen (Associate Researcher, Guangxi Academy of Sciences), China

ABSTRACT

Marine ecosystems face unprecedented threats, underscoring the critical role of marine education in fostering conservation awareness. Our organization has dedicated years to delivering impactful marine education programs, engaging communities through workshops, school outreach, and public events. These initiatives have reached thousands, cultivating a deeper understanding of ocean health and biodiversity. However, sustaining and expanding these efforts is challenged by limited funding, with costs for materials, staff, and outreach often exceeding available resources. To address this, we have launched self-funded nature education initiatives, including eco-tours, wildlife observation workshops, and citizen science projects. These programs generate revenue while aligning with our mission to promote marine conservation. By offering hands-on experiences, we connect participants directly with marine environments, reinforcing the value of protecting our oceans. This self-funded model not only supports financial independence but also amplifies community engagement, creating a sustainable framework for long-term marine education. Our presentation at the Marine Education Forum will showcase the successes and challenges of our programs, highlighting how self-funded initiatives bridge funding gaps while advancing conservation goals. We will share practical insights into designing revenue-generating nature education programs and discuss their broader impact on marine awareness. We invite collaboration and dialogue to explore innovative funding models, emphasizing the collective responsibility to educate and protect our oceans. Through these efforts, we aim to inspire a future where marine education thrives, empowering communities to safeguard marine ecosystems for generations to come.

PROFILE

Mo Chen
Associate researcher,
Deputy Director of the Science Education and Promotion Center, Guangxi Academy of Sciences,
Deputy Drector of Guangxi Key Laboratory of Marine Environmental Science,
PI of the Marine Mammal Research and Science Education Team.

Chen Mo is primarily engaged in research on marine mammals, particularly the study and conservation of Bryde's whales in the Beibu Gulf, as well as science education and marine education initiatives.

Since 2016, he has led a team in conducting research and conservation efforts for Bryde's whales on Weizhou Island in Southern China earning widespread recognition from various sectors of society. In 2024, he was profiled in a feature article by the internationally renowned academic journal Nature. His work has been featured multiple times by national and provincial media outlets, He has also served as a scientific consultant for documentaries and popular science programs.

CHALLENGE 10 of OCEAN DECADE

Challenge 9**Skills, Knowledge, and Technology for All**- Build capacity, share knowledge, and transfer marine technology to ensure equitable access to ocean science, particularly for developing countries.;Challenge 10**Change Humanity’s Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.;Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.

S6-2

The Effects of the National Marine Biodiversity Institute of Korea's Summer Camp on the Ocean Literacy of Korean Elementary Students

Jong-Mun KIM,Ph.D., Yi-Young KWON, Ph.D. (Director of Management Division, Education Team Leader at National Marine Biodiversity Institute of Korea), Republic of Korea

ABSTRACT

The purpose of this research is to examine the effects of the National Marine Biodiversity Institute of Korea's summer camp on the ocean literacy of Korean elementary students, focusing on knowledge and attitudes. Regarding the knowledge component of the ocean, there was a significant increase in the understanding of the following aspects: "The ocean and marine life shape the characteristics of the Earth," "The ocean makes the Earth habitable for living organisms," and "The ocean and humans are interconnected." Additionally, the overall ocean literacy score revealed a significant increase, indicating an improved understanding of the principles of ocean literacy. Students' attitudes toward the ocean also showed a significant changes from both a naturalistic and utilitarian perspective, likely reflecting the program's emphasis on marine biodiversity and its value.

Although research on ocean literacy remains limited, making it difficult to generalize the findings of this study, continuous research and the development of diverse programs are necessary in the future.

PROFILE

Dr. Jong-Mun KIM: As an elementary school teacher in Korea, he contributed to the field of formal marine education for about 20 years. After moving to the National Marine Biodiversity Institute of Korea in 2015, I have worked in the field of informal marine education. Also he has joined Asia Marine Educators

Association as one of the board members from 2016.

He has published both academic articles and several books themed around marine science education. He received his doctoral degree at the University of British Columbia, Canada. His dissertation focuses on elementary students' changes in ocean literacy during marine aquarium experiences.

Dr. Yi-Young KWON:

She is currently working as the Education Team Leader at the Exhibition and Education Center of the National Marine Biodiversity Institute of Korea (MABIK).

CHALLENGE 10 of OCEAN DECADE

Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S6-3

Wading In: Developing Ocean Literacy through Connection and Curriculum Integration

Meghan E. Marrero, Ph.D.(Professor, Mercy University), USA

ABSTRACT

In response to global efforts like the United Nations Decade of Ocean Science for Sustainable Development, this qualitative case study explores how teachers participating in a grant-funded ocean literacy (OL) initiative incorporated ocean content into their classrooms. Drawing on data from interviews, project reports, student symposium presentations, and field notes, the study identifies two emergent themes: the importance of fostering student connections to local waterways and the use of interdisciplinary approaches to integrate OL across subjects. Anchored in McKinley, Burdon, and Shellock's (2023) ten-dimensional framework of ocean literacy, findings show that teachers, many with little prior marine science background, developed their own OL while creatively embedding ocean content into social studies, math, and literacy instruction. These practices not only advanced student learning but also promoted environmental awareness, cultural understanding, and community engagement. The study offers implications for teacher professional development and curriculum design that emphasize place-based, integrated approaches to sustainability education in elementary schools.

PROFILE

Dr. Meghan E. Marrero is a Professor of Secondary Science Education and Co-Director of the Center for STEM Education at Mercy University. With a doctorate in Science Education from Teachers College, Columbia University, she brings over two decades of experience in science education, teacher development, and curriculum innovation. Dr. Marrero is a nationally recognized leader in STEM and ocean literacy, serving as Principal Investigator on more than $8 million in external funding from NSF, EPA, and other major organizations.

Her scholarship includes dozens of peer-reviewed publications and conference presentations focused on STEM teacher preparation, community-based environmental education, and the integration of engineering and computer science into K–12 classrooms. A former Fulbright Scholar and award-winning marine educator, Dr. Marrero is deeply committed to supporting teachers in high-need schools and fostering equitable STEM learning opportunities for

diverse student populations.

In addition to her university role, she provides science education consulting and professional development to schools and districts across the region. Dr. Marrero holds leadership roles in national organizations, including the National Marine Educators Association and the National Sea Grant Advisory Board, reflecting her dedication to advancing science education and sustainability on both local and global scales.

CHALLENGE 10 of OCEAN DECADE

Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S6-4

Advancing Ocean Literacy via Satellite Technology: Establishment of the First Ocean Satellite Ground Station at the University of Chittagong, Bangladesh

Mohammad Muslem Uddin, Ph.D. (Professor, Department of Oceanography, University of Chittagong), Bangladesh

ABSTRACT

Ocean literacy is critical for sustainable development, yet access to real-time oceanographic data remains limited in developing regions like Bangladesh. This paper presents the pioneering initiative of installing the first ocean satellite ground station at the University of Chittagong, enabling direct reception and analysis of satellite-derived ocean data (e.g., sea surface temperature, salinity, and chlorophyll concentrations). As part of a broader effort to integrate Ocean Observing Systems (OOS) into education, this project bridges the gap between scientific research and public awareness by empowering students, researchers, and coastal communities with actionable marine data. The station not only supports climate resilience and blue economy initiatives but also serves as a hub for capacity building in satellite oceanography and data literacy. Aligned with the conference theme "Promotion for OCEAN LITERACY WITH ALL," this work demonstrates how localized technological infrastructure can democratize ocean knowledge, foster interdisciplinary learning, and inspire stewardship of marine ecosystems. Lessons from Bangladesh's experience offer a scalable model for Global South nations seeking to enhance ocean education through affordable satellite-based solutions.

PROFILE

Dr. Mohammad Muslem Uddin is a Professor (Former & 1st Regular Chairman) of the Department of Oceanography at the University of Chittagong, Bangladesh. He joined the Institute of Marine Sciences and Fisheries as a lecturer in 2005 and was subsequently promoted to Assistant Professor and Associate professor in 2007 and 2016 respectively. In 2019 he joined the Department of Oceanography of the same University and served as the first regular Chairman of the department from July 2020 to July 2023. He was promoted to Professor on 31st January 2023.　Along with teaching and research at the university, he has been leading and involved with several professionals and voluntary organizations working for society, the environment, and education development. The teaching and research fields of Dr.

Uddin include Ocean Literacy, Coastal Oceanography and Geomorphology, Marine Ecology and Hydrography, Meteorology and Climate Science, etc. He is a proud member of Nippon Foundation (NF)- General Bathymetric Charts of the Ocean (GEBCO).

Dr. Uddin has been working as a visiting professor at the Asian University for Women, Bangladesh Marine Academy, the Noakhali Science and Technological University, Chittagong Veterinary and Animal Science University etc. He is the founder and Chairman of Blue Green Foundation Bangladesh; a non-profit volunteering organization working towards a blue economy-based green Bangladesh through developing an Ocean and Environment literate society since 2015. He is one of the initial organizers and board members of the Asia Marine Educators' Association (AMEA). He was also an elected Vice president of the IOCINDIO, the Intergovernmental Oceanographic Commission's Committee for the Indian Ocean. He is the Treasurer of the newly formed Oceanographic Society of Bangladesh (OSB). Dr. Uddin has been working as a resource person for NOAMI, the National Oceanographic and Maritime Institute in Bangladesh. He has been appointed as a member of the Pool of Experts (PoE) of the United Nations Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects (Regular Process).

He participated in a 26 days long research cruise onboard RV Oceanus' for the Across Atlantic Cruise for Ocean Acidification sampling and data collection project of the Woods Hole Oceanographic Institute, USA in 2011 and was a visiting scholar at Cornell University, USA in June-July 2016 working on Ocean Color Remote Sensing. He visited almost 22 states of the USA and more than 20 countries including SriLanka, Malaysia, South Korea, USA, Italy, Spain, Netherlands, Cyprus, Monaco, India, Philippines, Indonesia, France, Poland, Kenya, Japan and Singapore in previous years for training, workshops, conferences, meetings, and higher study purposes. He published more than 33 national and international journal articles on oceanographic issues.

Born in, Chittagong, Bangladesh (2nd January 1976), Dr. Uddin earned PhD in Earth Science from the University of Ferrara, Italy in 2015; completed an Advanced post-graduation (Cat A) in Hydrography from the Centre for Coastal and Ocean Mapping (CCOM), University of New Hampshire, USA in 2011. He completed his BSc. (Hons) & MSc in Marine Science from the Institute of Marine Sciences of the University of Chittagong, Bangladesh in 2001 and 2003 respectively.

CHALLENGE 10 of OCEAN DECADE

Challenge 7**Expand the Global Ocean Observing System**- Enhance the global system for ocean observations, ensuring better data collection, sharing, and application to support science and decision-making.

S6-E

Marine Natural Product Research on Marine Sponges (Porifera) and Sea Cucumbers (Holothuroidea)

Kazuya Fukuhara, Ph.D.(Assistant Professor, Tokyo University of Marine Science and Technology), Japan

ABSTRACT

Marine environments support a remarkable diversity of organisms and give rise to ecosystems that are distinct from terrestrial ones. Some of these marine organisms synthesize various specialized metabolites, known as marine natural products, that exhibit potent biological activity. Consequently, extensive research has been conducted on marine natural products to identify toxic compounds, discover lead compounds for drug development, and explore other potential applications. Among all marine organisms, marine sponges (phylum Porifera) are the richest source of natural compounds identified to date. Marine sponges are among the most primitive multicellular organisms, and their bodies harbor a large number of symbiotic microorganisms, most of which are unculturable. Some of these microorganisms biosynthesize natural products within the sponge, resulting in the presence of various bioactive compounds in marine sponges.

In my research, novel bioactive natural products were investigated in the marine sponge Theonella swinhoei. T. swinhoei is a rich source of natural products, with more than 40 bioactive polyketides and peptides have been isolated from this species. The extract of T. swinhoei collected from Hachijo Island was analyzed by HPLC-MS (high-performance liquid chromatography-mass spectrometry) and several unidentified compounds were detected. Among them, seven bioactive peptides, nazumazoles A–F and theonellamide I, were isolated. Nazumazoles A–C were cyclic pentapeptide dimers and nazumazoles D–F were monomer-like derivatives of A–C. The dimers exhibited cytotoxicity against murine leukemia cells, whereas the monomers showed no cytotoxicity against the same cells. Theonellamide I was a novel derivative of the bicyclic peptide group known as theonellamides, and it exhibited cytotoxicity against human cervical cancer cells. Interestingly, theonellamide I was detected exclusively in certain colonies of T. swinhoei from Hachijo Island.

In addition to this research on marine sponges, I will introduce bioactive compounds from sea cucumbers (Holothuroidea), which are the next focus of my research.

PROFILE

Kazuya Fukuhara is currently an assistant professor in the Department of Ocean Science at Tokyo University of Marine Science and Technology (TUMSAT), Japan. He received his Ph.D. in Agriculture from the University of Tokyo, where he investigated novel bioactive natural products from the marine sponge Theonella swinhoei and found seven bioactive peptides (nazumazoles A–F and theonellamide I). After receiving his degree, he worked for two years in a private pharmaceutical company. He then spent two years at Iwate Biotechnology Research Center, Japan, and three years in the Department of Biotechnology, Faculty of Bioresource Sciences, Akita Prefectural University, Japan. At these institutions, he investigated bioactive compounds with health benefits for humans from millet grains and edible mushrooms. As a result, he identified bioactive saponins from grain amaranth (Amaranthus hypochondriacus) and the bran of Japanese barnyard millet (Echinochloa esculenta). In addition, he determined the structure of aragezolone, a novel pink-purple pigment isolated from the edible mushroom Auricularia cornea, which has demonstrated potential health benefits. He subsequently joined TUMSAT, where he is currently investigating bioactive saponins from echinoderms (sea cucumbers and starfish) to elucidate their health benefits and physiological functions of these compounds in their producers.

CHALLENGE 10 of OCEAN DECADE

Challenge 2 ハ**Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.

S7-1

Marine education Curriculum Practice in the Primary school stage

Binlan Liang (Research Assistant, Guangxi Academy of Sciences), China

ABSTRACT

This study presents a case study conducted at a primary school in the Beibu Gulf region, where an 11-session marine education curriculum was implemented for all third-grade students. Through a mixed-methods approach incorporating questionnaire surveys and formative assessments, the research systematically evaluated the instructional effectiveness and developmental pathways of the marine education program.The results demonstrate: (1) The curriculum achieved broad student acceptance, with over 90% of respondents reporting significantly enhanced understanding of local marine ecosystems, and more than 80% expressing strong interest in the course content while perceiving the difficulty level as appropriate; (2) Standardized testing revealed an average knowledge acquisition rate of 60%, meeting baseline teaching objectives but showing significant divergence from students' self-evaluations, indicating notable cognitive bias; (3) Despite strong support from both educators and students (with approval rates exceeding 80%), implementation encountered multiple challenges, particularly acute shortages of qualified marine education instructors and insufficient programmatic support.These findings underscore both the potential and challenges of implementing marine education curricula in coastal primary schools, highlighting the need for specialized teacher training and institutional support mechanisms to ensure program sustainability.

PROFILE

Binlan Liang majored in Marine Education, systematically studying fundamental theories in marine science and educational methodology, with a focus on knowledge dissemination models for marine science in primary education. Over the past five years, She has actively participated in marine scientific surveys along the coastal areas of Guangxi, China, including specialized research on intertidal benthic biodiversity and Bryde's whale population monitoring. She has accumulated over 200 field survey days and contributed to the establishment of a regional marine ecological database.

Dedicated to developing marine education curricula for primary schools, she conducted a two-year teaching practice at an experimental elementary school in Guangxi, delivering 50+

marine science lessons to over 260 students. This initiative aimed to explore an age-appropriate marine education framework for young learners.

CHALLENGE 10 of OCEAN DECADE

Challenge1 **Understand and Beat Marine Pollution- Identify and eliminate sources of pollution in the ocean, including plastics, chemicals, and other pollutants, to protect marine ecosystems and human health.;Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.;Challenge 4**Develop a Sustainable Ocean Economy** - Promote sustainable economic activities in the ocean, such as fisheries, renewable energy, and tourism, while minimizing environmental impacts.;Challenge 6**Increase Community Resilience to Ocean Hazards**- Strengthen the ability of communities to prepare for, respond to, and recover from ocean-related hazards such as tsunamis, hurricanes, and sea-level rise.;Challenge 8**Create a Digital Representation of the Ocean**- Build a comprehensive, digital map of the ocean, integrating physical, chemical, and biological data to improve understanding and management.;Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S7-2

Understanding ocean literacy through research and experience perspectives among Filipino and Indonesian youth

Jose Marie A. Eslopor (Regional Research Center, University of the Philippines Visayas), Philippines

ABSTRACT

The Indonesian and Philippine archipelagic communities are heavily reliant on coastal resources, making them vulnerable to climate-related threats such as sea-level rise, flash floods, and storm surges. The East-West Center Environmental Innovation Research Corps (EWCInnovationCorps) aims to improve ocean literacy and promote environmental research using a peer-to-peer mentorship approach rooted in both traditional and technical ecological knowledge aligned with the Sustainable Development Goals (SDGs). This initiative involved focus group discussions, lectures, and research proposal pitching. Direct participants included five (5) social development students from Universitas Mulawarman in Samarinda, Indonesia, and 17 environmental studies students from the University of Antique in the Philippines, with indirect participants reaching 60 in Samarinda. Findings in Indonesia highlighted the importance of research-based social inclusion and sectoral representation in shaping policies, with themes such as ethnoscience, blue economy, and climate migration reflecting local vulnerabilities. In the Philippines, key themes included research-driven social development and effective science communication, especially in addressing issues like flash floods caused by illegal quarrying and low awareness of ecological systems. A notable 13.6% improvement in pre- and post-test scores in the Philippines demonstrated increased ocean literacy. The study concludes that geopolitical context significantly affects environmental awareness and participation. While Indonesia emphasized participatory decision-making, the Philippines focused on science communication as a driver for sustainable development. Both approaches utilized traditional and scientific knowledge and local climate experiences. Ultimately, the project underscores the need to democratize ocean literacy, empower local communities, and enhance participatory mechanisms for more equitable and effective sustainable development across coastal regions.

PROFILE

Jose Marie Eslopor or JM is an early career researcher and community development from Iloilo, Philippines. He is focusing on community-based marine conservation education, fisheries

extension, gender in fisheries, sustainable ecotourism, and science communication. He took up Bachelor of Arts (Community Development-Psychology) and pursued Master of Marine Affairs, both from the University of the Philippines Visayas. He is an alumnus of the YSEALI Academic Fellowship Spring 2022 Cohort for Environmental Issues at the East-West Center and has been engaging with the YSEALI alumni community since 2017. Currently, he is the University Extension Specialist I at the UP Visayas Regional Research Center which focuses on conducting public service programs centered on laymanizing research and development results and science communication. Outside of his work, he is also a volunteer and community development practitioner working with coastal communities in implementing marine conservation education projects and raising awareness on how youth and community can participate in the conservation and advancement of public policies and community mobilization of coastal biodiversity protection and sustainable fisheries resources management.

CHALLENGE 10 of OCEAN DECADE

Challenge 6**Increase Community Resilience to Ocean Hazards**- Strengthen the ability of communities to prepare for, respond to, and recover from ocean-related hazards such as tsunamis, hurricanes, and sea-level rise.;Challenge 9**Skills, Knowledge, and Technology for All**- Build capacity, share knowledge, and transfer marine technology to ensure equitable access to ocean science, particularly for developing countries.;Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S7-3

Relational Values in the Forest-River-Ocean Nexus: A Case Study of the Hei River Basin in Northeastern Japan

Sico Li, Tsuyoshi Sasaki, Ph.D.(Master student, Tokyo University of Marine Science and Technology), China, Japan

ABSTRACT

Objective: In recent years, relational values, as the third value of humans and nature, have attracted much attention. In this study, we take the Hei River basin of Miyako City, as the research object, and explore the relational values of watershed residents to the surrounding environment in the context of the connection between the forest, river, and ocean.

Methods:①Semi-structured interview ②Qualitative analysis: Scat & Relational values syntax

Results: Our research identified four relational values for the Hei watershed: Believing in mountains, Caring for the river, Living together with nature, and Adjusting the watershed environment appropriately. Furthermore, our research reveals the importance of knowledge sharing in the maintenance and cultivation of the relational values of the watershed. Also, the relational values generated by human interaction with the river play an indirect role in the connected ocean and mountain environment.

These relational values are based on the intrinsic value of the watershed environment itself and coexist with instrumental values. Because these relational values can be the key to maintaining the sustainability of this basin's interactions between people and nature, we look forward to more research on the relational value concept in non-Western society.

PROFILE

Sico Li is a doctoral student at Tokyo University of Marine Science and Technology. Her research focuses on the relationship between watersheds, the marine environment, and human interaction. she aims to explore the significance of marginalized pluralistic environmental values within the context of traditional dualistic frameworks. Additionally, she has an interest in foundational knowledge of related disciplines, including psychology,

ecosystem services, marine policy and management, marine ethnology, and environmental philosophy.

CHALLENGE 10 of OCEAN DECADE

Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S7-4

Advancing the Vision of the Ocean Decade: Empowering Ocean Literacy through Global Collaboration and Innovation

S7-4 ○Teresa Kennedy,Tsuyoshi Sasaki, Valentina Lovat, Meghan Marrero, Ninja Mueller, Ray Yen & Li Ying Lin

(Professor, University of Texas at Tyler)

ABSTRACT

This session highlights an ambitious new global initiative to accelerate progress toward the goals of the United Nations Decade of Ocean Science for Sustainable Development. Ocean Literacy: The Foundation for the Success of the Ocean Decade is a comprehensive three-volume book series officially endorsed as an Ocean Decade Activity by UNESCO's Intergovernmental Oceanographic Commission (IOC). Scheduled for publication by Springer Nature in 2025, the series brings together the work of 250 authors from 40 countries, representing a diverse range of expertise across education, science, policy, community development, and the arts.

This transformative collection builds upon key international frameworks, including the Challenge 10 White Paper and the NGO Guide to the Ocean Decade, and offers real-world examples of how Ocean Literacy is being implemented and expanded across regions and sectors. The presentation will feature an overview of the series' three thematic volumes—focused on transforming education and research, fostering community and the Blue Economy, and accelerating communication, technology, and global initiatives. Selected authors from all three volumes will offer insights into their chapters and share practical approaches for advancing Ocean Literacy as a catalyst for informed decision-making, youth empowerment, and inclusive Ocean action.

Participants will gain a deeper understanding of how Ocean Literacy contributes to Ocean sustainability, intergenerational equity, and the co-design of solutions. This session offers a unique opportunity to explore the power of collective storytelling and international collaboration in shaping a more Ocean-literate world.

PROFILE

Teresa Kennedy, PhD, is a professor at the University of Texas at Tyler, a three-time Fulbright Scholar, and an active marine oceanographer with extensive experience in international science education. A past president of the International Council of Associations for Science Education (ICASE), she continues to serve as the ICASE representative to UNESCO. She has

held three elected positions on the UNESCO NGO Liaison Committee, most recently as vice president and liaison to the Intergovernmental Oceanographic Commission (IOC). She played a key role in shaping the U.S. National Science Teaching Association (NSTA)'s international science initiatives, serving five terms on its International Advisory Board from 2004 to 2024. Additionally, she contributed as a writing team member for the joint NSTA and NMEA Ocean Literacy position paper in 2024-2025. As former Deputy Director of NASA's GLOBE Program, she strengthened her commitment to global collaboration, working with science education leaders in over 100 countries. Teresa has dedicated her career to enhancing global science education, promoting Ocean Literacy, and contributing to international STEM and sustainability initiatives. Serving as the editor and driving force behind this project, she conceived the initiative and oversaw its development, ensuring a cohesive and impactful collection that brings together diverse voices to advance Ocean Literacy.

CHALLENGE 10 of OCEAN DECADE

Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

S7-E

Measuring tsunami currents using shipborne AIS records from unspecified vessels

Daisuke Inazu, Ph.D.(Associate Professor, Tokyo University of Marine Science and Technology), Japan

ABSTRACT

I present that shipborne automatic identification system (AIS) data can be used to measure large tsunami currents. As shown by the MarineTraffic website (https://www.marinetraffic.com), AIS data are aggregated from many unspecified vessels in the world ocean. According to the AIS regulations of the International Maritime Organization (IMO), vessels that satisfy a certain standard have to transmit their navigational information (e.g., time, position, course, speed, name, size, destination, and so on) in a specified format via the specified VHF bands. Important purposes of AIS are maritime safety and trade statistics. Transmitted AIS messages are collected by many agents of terrestrial and satellite receivers. Using the compiled AIS data with GIS software, we also visualize the vessels' information on geo-spatial maps. One of my professions is tsunami research. I reported that the tsunami current due to the 2011 March 11 Japan great earthquake was quantitatively measured by AIS data from unspecified offshore vessels. In general, vessels are drifted by ocean surface currents (tidal and ocean currents such as Kuroshio), which is also measured by AIS data. These measurements are the results from extraordinary uses of AIS data. Now I am investigating for real-time tsunami forecast system using AIS from a lot of unspecified offshore vessels. Revision of laws and regulations related to AIS with IMO will be also a milestone in the near future for achieving the tsunami forecast system. I hope that motivated young people will discover other new values in such maritime domain awareness data.

PROFILE

Dr. Daisuke Inazu is an associate professor in the Department of Marine Resources and Energy at the Tokyo University of Marine Science and Technology. He received his Ph.D. in geophysics from Tohoku University, Japan, in 2007. His research experiences have been mainly based on numerical simulation of physics of the ocean such as tsunamis, tides, and storm surges. He primarily focuses on understanding, forecasting, and evaluation of such ocean variations, and then on their effective utilizations with flooding disaster mitigations at coastal seas.

https://sites.google.com/site/inazud4ocean/home

CHALLENGE 10 of OCEAN DECADE

Challenge ハ 6**Increase Community Resilience to Ocean Hazards**- Strengthen the ability of communities to prepare for, respond to, and recover from ocean-related hazards such as tsunamis, hurricanes, and sea-level rise.;Challenge 8**Create a Digital Representation of the Ocean**- Build a comprehensive, digital map of the ocean, integrating physical, chemical, and biological data to improve understanding and management.;Challenge 7**Expand the Global Ocean Observing System**- Enhance the global system for ocean observations, ensuring better data collection, sharing, and application to support science and decision-making.

Poster Presentation

P-01

Place as Home: Reconstructing the Relationship Between Sustainability and the Self Through a Field-Based Course

CHEN,HSIN-SHIH (Taiwan Marine Education Center, National Taiwan Ocean University), Taiwan

ABSTRACT

In the face of escalating environmental crises, humanity is called to rethink the relationship between self, sustainability, and the meaning of home. This study investigates how a field-based general education course, Ecological Community Building, enables university students in northern Taiwan to reconstruct their sense of connection to place through experiential learning.

Students participated in a five-day field study across Keelung, Xizhi, and Jianshi, exploring coastal areas, fishing villages, ports, urban spaces, and mountain indigenous communities. By engaging in local dialogue and place-based immersion, they critically examined the complex interplay between economic development, ecological conservation, and community values.

The researcher, serving as a participant observer and teaching assistant, collected six types of qualitative data, including student reflections, interviews, and course recordings. Findings highlight two key learning outcomes: how students come to see a place as their own "home," and the evolving process by which they internalize environmental and social meanings tied to that place.

This course fosters a "walk-dialogue-reflect" learning model, encouraging deeper understanding of sustainability rooted in local contexts. The study suggests integrating the concept of “place as home” into environmental, sustainability, and marine education to cultivate meaningful and action-oriented learning experiences.

Key Keywords: field-based learning, place as home, environmental education, marine education, sustainability education

PROFILE

Chen Hsin-Shih is currently working as a research assistant at the Taiwan Marine Education Center at National Taiwan Ocean University. His major is Environmental Education, and I am involved in a research project that connects Taiwan's marine education curriculum with international sustainable development.He comes from Keelung, a harbor city in Taiwan known for its beautiful coastline and rich fishing resources. The most famous seafood there is

the small squid. In recent years, he has frequently led students and visitors on walking tours to explore Keelung. I invite everyone to visit Keelung, where I can introduce you to the natural and cultural landscapes of this area. I look forward to exploring every place we visit together through the approach of "walk-dialogue-reflect."

CHALLENGE 10 of OCEAN DECADE

Challenge 4**Develop a Sustainable Ocean Economy** - Promote sustainable economic activities in the ocean, such as fisheries, renewable energy, and tourism, while minimizing environmental impacts.;Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.;

P-02

Branding Eco-Friendly Products: An Empirical Study Using Conjoint Analysis in Japan

Yiran Li, Tsuyoshi Sasaki, Ph.D.(Master student, Tokyo University of Marine Science and Technology), China, Japan

ABSTRACT

In recent years, eco-friendly products have become increasingly important in the shift toward sustainable societies. This study explores how environmental education and relational values influence consumer choices, especially regarding ocean-related sustainability and literacy.

Through a tasting event and questionnaire designed with educational elements, I collected consumer preference data in Japan. Using conjoint analysis, I identified which product attributes—such as eco-labeling, price, origin, and storytelling—most impact purchasing decisions. The study also considers how relationship-based values (e.g., trust in producers, emotional connection to the ocean) affect willingness to choose sustainable products.

My research bridges environmental education, marketing, and ocean literacy by examining how branding strategies can be used to promote sustainable behavior through deeper value connections, not just functional benefits. The findings suggest that integrating storytelling and educational components into product branding may enhance consumer engagement and support for ocean-friendly products.

This study contributes to broader discussions on how to foster pro-environmental behavior by combining policy tools, education, and emotional narratives. It offers insights for companies, educators, and policymakers aiming to encourage responsible consumption while raising awareness of ocean-related environmental issues

PROFILE

I am currently a second-year Master's student in the Department of Marine Policy and Management at Tokyo University of Marine Science and Technology. My academic background combines language and policy: I earned my Bachelor's degree in Japanese Interpreting at Beijing International Studies University.

CHALLENGE 10 of OCEAN DECADE

Challenge 3**Sustainably Feed the Global Population**- Develop innovative and sustainable ways to use marine resources for food production, ensuring food security while maintaining healthy ecosystems.;Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.;

P-03

Water Purification

Asahi Shibahashi, Rio Matsuda, Kurumi Shimazu, Momone Tatsumoto, Aoi Tada(Student, Momoyama Gakuin High School), Japan

ABSTRACT

We are engaged in an activity that purifies water in rivers and other bodies using recycled disposable hand warmers, which would normally be thrown away. This project began when our club advisor learned through an acquaintance that used hand warmers could be utilized to purify water. Inspired by this idea, we considered whether a similar initiative could be carried out at our school.

We conduct this project in cooperation with a Japanese company called Go Green Japan, which is also the origin of our project's name. The company collects used hand warmers from across Japan and produces the cubes we use. As part of our activities, we also collect used hand warmers within our school every winter and send them to the company for reuse.

Specifically, we use cubes made from the powder inside used hand warmers and place them in bodies of water such as the moat of Minegazuka Kofun—part of the Mozu-Furuichi Kofun Group, a UNESCO World Heritage Site—and the Dotonbori River, a famous tourist destination in Osaka. Through approximately four years of continuous effort, we have confirmed visible improvements in water clarity.

Moving forward, we hope to spread awareness of this activity and carry out water purification efforts in various locations. By promoting sustainable practices and rethinking waste, we aim to contribute to solving environmental issues through student-led initiatives.

PROFILE

We are "Momoyama Go Green Project," a student group from Momoyama Gakuin High School (St.Andrew's school) in Osaka that mainly focuses on environmental activities related to the SDGs. This is our fifth year of activity, and we currently have around 30 members.

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carried out at our school.

CHALLENGE 10 of OCEAN DECADE

Challenge1 **Understand and Beat Marine Pollution- Identify and eliminate sources of pollution in the ocean, including plastics, chemicals, and other pollutants, to protect marine ecosystems and human health.;

P-04

Marine Education: Using Fish on the Dinner Table as a Starting Point - The Challenge at Osakana Elementary School

Makoto Suzuki(Representative director, Japan Sustainable Seafood Association), Japan

ABSTRACT

The online educational program "Osakana Elementary School, by the Japan Sustainable Seafood Association, offers lessons on various themes, including marine life, the ocean, fishing, food culture, and environmental issues, all centered around familiar seafood. This program attracts children and parents from across the country. As more individuals move away from coastal areas and feel increasingly disconnected from the ocean, the program seeks to foster an understanding of marine environments through relatable foods such as tuna and salmon. Since its inception in 2021, the program has broadened its activities, providing more opportunities to extend beyond online classes to elementary schools and to conduct mock classes at university faculties of education. We aim to present this initiative as a form of marine education that can be effectively implemented even in landlocked prefectures.

PROFILE

Born in Tokyo in 1980, he studied at the Faculty of Integrated Human Studies at Kyoto University, where he became aware of the issue of "fish decline" in the fishing industry. To gain firsthand experience, he apprenticed as a fisherman for a year. After graduating, he worked for a wholesale company at Tsukiji Market and an international non-profit organization before becoming independent in 2019 under the name "Japan Fisheries Certification Support." He is dedicated to promoting sustainable fishing practices. In 2021, he founded the Japan Sustainable Seafood Association and launched "Osakana Elementary School," which offers online classes.

CHALLENGE 10 of OCEAN DECADE

Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness,

education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

P-05

Developing a Simple Method for Investigating Plastic in Seawater in Inquiry-Based Learning

Subaru Nakazato, Tadashi Nakazato(Student at Tokyo Metropolitan College of Industrial Technology, Head Teacher at Shibuya Municipal Uehara Junior High School), Japan

ABSTRACT

In the Izu Islands, schools and communities regularly conduct beach cleanups, but the amount of trash does not decrease each time, and they contain a large amount of trash from outside the islands. To understand this current situation, we surveyed the amount of plastic contained in beach sand during inquiry-based learning at a junior high school by comparing the beaches of the Izu Islands and Chiba Prefecture. Later, we learned that the world's major surveys of microplastics are conducted in seawater, and we developed a simple survey method of plastics in seawater that junior high school students can perform. The students swam and collected seawater from the ocean surface while pulling plankton nets at two beaches in the Izu Islands and two beaches in Chiba Prefecture. Materials in the collected seawater were separated according to mesh size using filters, and the plastics contained in the materials were collected and examined visually and microscopically for their types and amounts. Based on the survey results, we compared the number of pieces of plastic in beach sand and seawater over the same area and attempted to understand the global plastic problem.

PROFILE

My previous school was Shikinejima Junior High School in the Izu Islands, where I worked as science teacher for six years. There, I was involved in ocean education as part of local understanding education and implemented educational activities as a school adopted under the Ocean Education Pioneer School Program in 2022 and 2024.

CHALLENGE 10 of OCEAN DECADE

Challenge 7**Expand the Global Ocean Observing System**- Enhance the global system for ocean observations, ensuring better data collection, sharing, and application to support science and decision-making.

P-06

Macro Impacts of Microplastics: Investigating Coastal Plastic Pollution

Lisa Grim(Teacher,Linden Hall School Junior and Senior High School), Japan

ABSTRACT

Middle school students participated in a beach clean on the coast of Fukuoka prefecture. They collected data on plastic abundance, which was then visualized through artwork. They developed communication and creative skills alongside environmental knowledge through hands-on analysis and action for marine pollution.

PROFILE

Linden Hall High School Japan is an English immersion middle school and high school located in Fukuoka. Linden Hall is an Article 1 high school and has received a Special Designation for Environmental Education through the Ministry of Education (MEXT). Students develop knowledge and skills relating to the environment and ocean through Environmental Science class, student committees, and yearly events.

CHALLENGE 10 of OCEAN DECADE

Challenge1 **Understand and Beat Marine Pollution- Identify and eliminate sources of pollution in the ocean, including plastics, chemicals, and other pollutants, to protect marine ecosystems and human health.;Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

P-07

The problem of marine plastic waste at Yuigahama Beach: Expressing the sea of my hometown through clinical art

Eri Furuta(Art Instructor, Nozomi Nursery School), Japan

ABSTRACT

In this study, we developed a marine education program incorporating beach cleanups and art activities for nursery school children and shared it with their parents. We confirmed that the children deepened their interest in marine debris issues and expressed their ideal ocean through art.

PROFILE

Eri Furuta is a clinical psychologist who studied art therapy as a graduate student. She currently works as an art instructor at a nursery school, teaching clinical art and marine education.

CHALLENGE 10 of OCEAN DECADE

Challenge 10**Change Humanity's Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.

P-08

International Kuroshio collaborative research programme – 2nd Cooperative Study of the Kuroshio and its Adjacent Region (CSK-2)

Akira Nagano, Japan

ABSTRACT

As a successor of the international Kuroshio observation programme during 1965-1977, called the Cooperative Study of the Kuroshio and Adjacent regions (CSK), the CSK-2, has been initiated since 2022 as a scientific programme of UN Decade of Ocean Science for Sustainable Development. The CSK-2 has two objectives; to elucidate the relationship between the Kuroshio Current and climate and weather, and its impact on marine ecosystems. As of now, 14 projects from 6 countries participate the CSK-2. In order to achieve the goals, we share information on progresses, discuss future cooperation and direction, and solicit new proposals. In particular, we are stimulating research activities across the themes through data sharing and gaining a deeper understanding of the Kuroshio and surrounding current systems due to data assimilation are future tasks, and are working on them. In this poster presentation, we introduce the present efforts and the progress of the CSK-2, and discuss its future.

PROFILE

I am engaged in ocean circulations and air-sea interaction in the western North Pacific, including the Kuroshio. As a PI of an international Kuroshio collaborative research programme, the 2nd Cooperative Study of the Kuroshio and its Adjacent Region (CSK-2), I am involved in the CSK-2. In the conference, I would like to introduce our activity and discuss the future.

CHALLENGE 10 of OCEAN DECADE

Challenge1 **Understand and Beat Marine Pollution- Identify and eliminate sources of pollution in the ocean, including plastics, chemicals, and other pollutants, to protect marine ecosystems and human health.;Challenge 3**Sustainably Feed the Global Population**- Develop innovative and sustainable ways to use marine resources for food production, ensuring food security while maintaining healthy ecosystemsChallenge 7**Expand the Global Ocean Observing System**- Enhance the global system for ocean observations, ensuring better data collection, sharing, and application to support science and decision-

making.;Challenge 8**Create a Digital Representation of the Ocean**- Build a comprehensive, digital map of the ocean, integrating physical, chemical, and biological data to improve understanding and management.

P-10

Why doesn't OLs penetrate society?

Hiromi　Inoue, Renhao Gao, Jina　Ku, Ms. Mizuho Kato(Master student, Tokyo University of Marine Science and Technology), Japan, China, Republic of Korea

ABSTRACT

Our team is conducting research on marine environmental initiatives led by aquariums, the shipping industry, local communities, and private companies. Our analysis shows that many of these efforts are symbolic or superficial, often aimed more at improving public image or generating economic benefits than achieving real environmental progress. In many cases, these actions remain formalities and fail to address the core challenges of marine environmental issues.

We believe that one major reason for the emergence of such performative actions is the lack of widespread ocean literacy throughout society. Without a fundamental understanding of how ocean systems work, it is difficult for stakeholders to grasp the complex interconnections of marine issues or to develop effective, science-based, and locally grounded strategies.

To close this gap, we emphasize the importance of Ocean Decade Challenge 10. We focus on designing immersive educational facilities and programs, and on conveying the voices of people in regions affected by environmental degradation through storytelling. We believe that these approaches can help shift environmental issues from something distant to something personal, encouraging meaningful, proactive engagement and behavioral change.

PROFILE

Name: Hiromi Inoue　Affiliation: Master Student, Tokyo University of Marine Science and Technology

-Research:　・Marine science and environmental education.　・Community development for sustainability and SDGs promotion.

・Facilitation techniques and fostering intrinsic motivation for innovation.

Name: Jina Ku

Affiliation: Korea Maritime and Ocean University　/ Tokyo University of Marine Science and Technology

Research: “A Study on the Activation of ESG in Shipping Companies” Focusing on Major Domestic and International Shipping Companies

Name: Gao Renhao

Affiliation: M1 Tokyo University of Marine Science and Technology

Research: The Impact of Differences in Awareness of Hydrosphere Environmental Education among People Living Near Water on the Enhancement of Relational Value.

Name: Mizuho Kato

Affiliation: M1 Tokyo University of Marine Science and Technology

Research: Aquarium exhibition planning Education

- The educational benefits of aquariums

CHALLENGE 10 of OCEAN DECADE

Challenge 10**Change Humanity’s Relationship with the Ocean** - Foster awareness, education, and behavioral change to inspire a more sustainable and respectful relationship with the ocean.;Challenge 2 **Protect and Restore Ecosystems and Biodiversity**- Map, conserve, and restore marine ecosystems and biodiversity to ensure their long-term sustainability and resilience.

Ocean Education Pioneer School Program

PSP-1

Exploring Kombu's Strengths: A Local Approach to Global Potential

Presenters: Kokoro HORIHATA, Misora SATO, Kohsuke SEKINE, and Manami OKUBO

(Ritsumeikan Keisho Junior and Senior High School), Japan

ABSTRACT

On December 4, 2013, "Washoku" (traditional Japanese cuisine) was registered as a UNESCO Intangible Cultural Heritage. At the heart of Washoku lies the umami of kombu (kelp). Hokkaido accounts for over 90% of Japan's kombu production, making it one of the region's most important marine resources. However, in recent years, the number of kombu fishermen has been declining due to aging producers and a lack of successors. To address this issue, it is essential to raise awareness of kombu's appeal and increase its consumption.

We believe that by exploring uses for kombu beyond food, we can stimulate demand, encourage producers to take pride in their work, and help prevent the decline of kombu fisheries. Ultimately, we aim to revitalize both the kombu-producing regions and the kombu industry.

We have studied current initiatives related to kombu in Hokkaido. In Hamamasu, Ishikari City, the Sachiumi Heroes LLC, a Yokohama-based company, began cultivating kombu in November 2024 as part of efforts to combat global warming. During the growth of kombu and wakame, parts that fall off and do not decompose for long periods are treated as blue carbon, drawing attention for their environmental benefits. Aquaculture projects like this are seen as a way to revitalize local industries and contribute to sustainable development.

In Sunagawa City, Hokkaido, the cosmetics brand "SHIRO" has developed products using gagome kombu. These utilize the root portions that adhere to rocks—parts that were previously discarded because they were too tough to eat. In Sapporo, the chocolatier Chocolatier Masále developed a product called Brisée au KOMB in 2023, which uses powdered ma-kombu from Kurokuchihama. One percent of its sales are donated to a project aimed at improving Hokkaido's marine environment.

In Shikabe Town, Hokkaido, efforts are underway to "create forests that protect rich seas." The volcanic soil in Shikabe, which contains pumice, is rich in fulvic acid—an essential nutrient for kombu. The richness of the forest contributes to the abundance of marine life, making forest management equally important.

With the goal of revitalizing the kombu industry and its production regions, we will continue to propose and promote kombu-related initiatives. At nursery schools, we will introduce the "potential of kombu" to children and their parents, helping them understand the impact of kombu and global warming. Within our school, we will offer kombu broth tastings and suggest ways to use kombu to students and parents. We also plan to propose a "Kombu Fair" in the school cafeteria to help people rediscover the value of Washoku. By providing opportunities to enjoy kombu, we hope more people will come to appreciate its unique charm.

PSP-2

“Umi no gakkou” (Marine School), an initiative of the Mie Junior High School

Presenters: Kosuke ISHIKAWA and Shuhei MIYATA
Mie Junior and Senior High School, Japan

ABSTRACT

We will present an overview of the "Umi no gakkou" program that Mie Junior High School has been conducting for the past 16 years, along with reflections from students who participated this year.

As part of this program, students visit the local Matsunase tidal flats and attend lectures by a diverse group of experts, including:

- Professor Taeko Kimura and Researcher Shoichi Kimura from the Marine Ecology Laboratory, Faculty of Bioresources, Mie University
- Mr. Tatsuya Sato from Zakko Club
- Ms. Rurika Matsumura from the Graduate School of Regional Innovation Studies, Mie University
- Mr. Masashi Tomooka, Advisor of the Matsusaka Fisheries Cooperative
- Mr. Ryo Fukuda, Chief of the Fisheries Division, Mie Prefectural Tsu Agriculture, Forestry and Fisheries Office
- Mr. Shujiro Kitagawa from the Resource Circulation Promotion Division, Environmental Symbiosis Bureau, Mie Prefectural Government
- Mr. Yuji Ogawa, Director of Nishikurobe Community Center.

These lectures provide students with insights into the Matsunase tidal flats from various perspectives—researchers, fishermen, government officials, nature observation specialists, and local community leaders.

The purpose of this program is to help students appreciate the beauty of the Matsunase coast, develop a multifaceted perspective by learning from people in different fields, and cultivate an attitude toward engaging in natural sciences.

In our presentation, we will share how the participating students felt after attending the lectures and experiencing the tidal flats, and how their views of the sea have changed as a result.

PSP-3

Feasibility study of long-term storage of eelgrass seeds

Ryo MAEDA, Riku TAKEBAYASHI, and Masayuki YANAGI
Okayama Gakugeikan High School, Japan

ABSTRACT

Since 2017, Medical and Science College Prep Course at Okayama Gakugeikan High School has been engaged in eelgrass bed restoration activities in Hinase Town, Bizen City, Okayama Prefecture, as part of its marine conservation education. In collaboration with local junior high schools and the fisheries cooperative, students carry out a yearly cycle of collecting drifting eelgrass and sowing seeds. Each year, every student also creates an individual eelgrass seedling pot.

However, the germination rate of eelgrass seeds varies from year to year and remains unstable. Moreover, in Japan, where natural disasters such as earthquakes, tsunamis, and typhoons are common, there is concern that eelgrass beds may be lost—Hinase Town is no exception. In the event of a disaster, securing seeds for restoration activities could become difficult. Therefore, we considered that storing eelgrass seeds year-round, regardless of environmental or seasonal changes, could enable stable and continuous restoration efforts. This approach could also allow for rapid recovery in the event of eelgrass bed extinction.

In this study, we examined suitable conditions for long-term seed storage from three perspectives: air pressure, oxygen concentration, and sterilization. Our hypotheses included vacuum storage, high-oxygen storage, and sterilized storage. Vacuum storage was expected to suppress drying and bacterial growth, which eelgrass seeds are vulnerable to. High-oxygen storage aimed to inhibit germination by continuously supplying oxygen, countering the seeds' tendency to germinate under anaerobic conditions. Sterilized storage involved using sodium hypochlorite to eliminate sulfur bacteria, preventing decay and potentially improving germination rates.

Initial experiments using seeds from Hinase yielded no germination and no valid data. We then repeated the experiments using seeds provided by the NPO Eelgrass Seed Bank from Fukui Prefecture. Germination was observed even under vacuum conditions, suggesting some effectiveness. In contrast, seeds exposed to oxygen without sterilization did not germinate, possibly due to aerobic bacterial growth. No clear differences were found between sterilized and non-sterilized conditions, indicating that sterilization may not always be effective.

However, due to the limited sample size, further experiments with more seeds are necessary to advance seed preservation efforts.

PSP-4

Exploring the expanding network of eelgrass bed restoration: collaboration with companies outside the prefecture and high school students nationwide

Miku EGUCHI, Sachiko SATO, and Tomohiro OOKUBO
Komatsushimanishi High School, Japan

ABSTRACT

This study aims to address the increasingly serious issue of “isoyake” (rocky shore barren) caused by climate change, by integrating local resources with commercial perspectives to build a sustainable business model that balances environmental conservation and economic activity. Through a multifaceted approach—including the use of underutilized fish, AI-powered underwater drones, and regional resource utilization—students engaged in practical inquiry-based activities.

In southern Tokushima Prefecture, rapid loss of seaweed beds has been observed, leading to reduced fish catches and fewer sea turtle nesting events, highlighting significant impacts on the natural ecosystem. At the same time, the local fishing economy is declining, making seaweed bed restoration a critical issue not only for biodiversity but also for regional economic recovery. Seaweed beds also function as blue carbon, absorbing and storing CO_2, contributing to climate change mitigation.

Based on marketing knowledge and problem-solving skills learned through commercial education, the study was built on two hypotheses: (1) Product development using underutilized fish can achieve both environmental and economic goals; (2) Seaweed bed restoration using local resources, combined with data visualization via underwater drones, can support the creation of a blue carbon credit system.

For Hypothesis 1, students collaborated with local businesses and culinary departments to develop retort-packaged foods using fish that are difficult to process and distribute. For Hypothesis 2, unused resources such as spent mushroom beds and sea urchin shells were used as fertilizer and deployed into the sea. AI-equipped underwater drones collected data on seaweed species, density, and area. The developed products incorporated regional identity and environmental awareness, with part of the sales revenue allocated to restoration efforts. Seaweed growth was confirmed after fertilizer deployment, showing positive restoration effects. Drone-based surveys proved to be six times more cost-effective than traditional diving methods, providing reliable data for blue carbon credit applications.

By integrating commercial education, local resources, and digital technology, the study

demonstrated the potential for a self-sustaining environmental business model independent of subsidies. Students' involvement in product planning, research, and analysis fostered active learning and practical skills. This research presents a new business model that simultaneously promotes environmental conservation and revitalizes local economies through applied commercial education. Future efforts will focus on expanding collaboration with other regions and promoting nationwide adoption and institutionalization.

PSP-5

Research and survey on the biodiversity of coastal areas in the Sasuna Elementary School area of Tsushima City

Joh OKADA, Taketo SHOJI, and Hidefumi HATASHIMA
Sasuna Elementary School, Tsushima City
, Japan

ABSTRACT

Sasuna Elementary School, located in Tsushima City, Nagasaki Prefecture, is situated on a remote island in the northern part of the prefecture. Positioned in the northwestern region of Tsushima Island, the school overlooks the Tsushima Warm Current and the Korea Strait. On clear days, the city of Busan in the Republic of Korea, about 45 kilometers away, can be seen with the naked eye.

The purpose of our research is to explore and identify the various living organisms inhabiting the coastal areas within the school area. In 2024, we participated in a coastal fishing activity along the Sasuna Port seawall by July, with cooperation from local fishers. Starting in September, interviews with fishers were conducted to investigate the species living in the coastal waters. Additionally, we observed and studied the behavior of brackish and coastal organisms by keeping them in fish tanks at school. By November, the findings were organized, and from December, exchange learning sessions were held with schools in other island cities such as Itoshima, Munakata, and Goto. In May 2025, with support from the Ecological Engineering Laboratory at Kyushu University, we visited Oshima Gakuen in Munakata City, where we presented our activities and participated in coastal fieldwork.

Through these activities, it became clear that not only are there many different fish species in the coastal areas of the school area, but they also inhabit a wide variety of ecosystems. We would like to introduce the “amazing” marine life of the Korea Strait, where the Tsushima Warm Current flows.

PSP-6

A program aimed at understanding, appreciating, and actively contributing to the preservation of Manko, a Ramsar-designated wetland and a treasured part of our hometown.

Aira HIGA and Masumi OHSIRO
Toyomi Elementary School, Toyogusuku City, Japan

ABSTRACT

Within our school district lies Manko, a tidal flat registered under the Ramsar Convention. Despite being located in an urban area, it is home to over 200 species of waterbirds, including the Black-faced Spoonbill, as well as a wide variety of other organisms that can be observed across the tidal flat. The Manko Waterbird and Wetland Center, operated by Japan's Ministry of the Environment, also provides opportunities for hands-on learning about this unique ecosystem.

Historically, Manko was an important port mentioned in Chinese records dating back to the 1600s, serving as a gateway for cultural exchange between China and Okinawa. Recognizing its ecological and cultural significance, our school has developed a curriculum that fosters appreciation for Manko's natural environment and maritime heritage. Through the use of ICT, we students share their learning experiences with the local community and beyond, including online exchanges with students from other prefectures. Together, they explore the theme of "The Future of the Ocean and Humanity."

This presentation will be given by fourth-grade student Aira Higa, who participated in the program last year as a third grader. Under the theme "Let's Learn About the Creatures of Manko," she engaged in direct observation and interaction with the tidal flat's ecosystem. Through these experiences, she developed a deep appreciation for the natural beauty of Manko and a growing sense of responsibility to protect it.

Her learning journey followed three main steps:

- Observing the creatures of Manko
- Researching and summarizing the observed species
- Sharing her findings with others

She played a central role in presenting her work to parents and the local community during the school's learning exhibition, and also at the Okinawa–Tokushima Inquiry-Based Learning Exchange held in February 2025, where she introduced the diverse life forms of Manko to audiences both within and outside the prefecture.

Firstly, she will reflect on what I learned as a third-grade student and share the outcomes of those experiences. (Ocean Literacy Principle 5: The ocean supports a great diversity of life and ecosystems.) And then she will share her current efforts as a fourth grader under the theme “What We Can Do for the Future.” Continuing her exploration of Manko, she has been investigating marine debris that washes ashore. Her activities include observing and collecting ocean waste and using these experiences to think critically about what actions we can take now — and in the future — to protect our environment. (Principle 6: The ocean and humans are inextricably interconnected.)