Congress Report

Prepared by

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Prof Matt Frost
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The 2nd World Congress of Marine Stations

27-29 November 2024

Shizuoka, Japan

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

The 2nd World Congress of Marine Stations 2024

27-29 November 2024 in Shizuoka, Japan

Contents

Registration Data Analysis

The 2nd World Congress of Marine Stations was held in Shizuoka, Japan from 27 to 30th November 2024, attracting a diverse group of participants engaged in marine science. The break-down below provides detailed statistics on attendance, highlighting the geographical distribution, roles, session participation, and sector representation.

Key Statistics:

- Total Attendance: The congress had a total of 87 attendees, including 79 onsite and 8 online participants.
- Countries Represented: Participants came from 23 different countries, showcasing the international scope of the event. The distribution of attendees by country included:
    - Japan (41)
    - United Kingdom (6)
    - United States (9)
    - Russia (4)
    - Singapore (2)
    - Canada, Brazil, Basque Country (Spain), Spain, China, Belgium, USA-Guam, Africa, Scotland, French Polynesia, Portugal, and several other countries with one participant each.
- Session Participation:
    - Oral/Poster Sessions: 25 participants presented either oral or poster contributions, engaging actively in the scientific programme.
    - Pre-Congress Activities: 24 attendees participated in pre-congress activities, indicating an interest in the extended scientific discussions.
    - Conference Dinner: 59 attendees joined the conference dinner, facilitating networking and collaborative discussions.

Sector Representation:

- Academic Professors and Researchers: The majority of attendees were affiliated with academic institutions, specifically 58 professors, associate professors, assistant professors, and researchers.
- Early Career Researchers (ECR) and Students: 21 early career researchers and students attended, demonstrating the congress's role in supporting upcoming marine science professionals.

Online vs. In-Person:

- There were 79 participants who attended the congress onsite, while 8 participants joined online, enabling a broader global participation.

WCMS 2024 Group Photo

Key Take-away Messages from Panel Discussions

The programme of the congress included the following sessions:

- Pre-congress round-table discussion “Why do we need a Global marine stations network”?
- Opening ceremony including a welcome address from Vidar Helgesen, Executive Secretary of the UNESCO-IOC
- Session 1 - World Association of Marine Stations: Overview and updates
- Session 2 - Marine stations and global research capacity
- Session 3 - Realising Dohrn’s vision. Marine stations as contributing to regional and global networks
- Special Session - MaOI Institute & Marine Station Management: Lessons from Disasters
- Poster Session & Flash Presentations of poster abstracts
- Session 4 - Marine stations and global policy
- Steering Committee meeting
- Post-conference marine station visit

During all sessions of the Congress that included a discussion panel (session 2, 3, and 4) and pre-congress round-table discussion, rapporteurs were allocated to record key take-away messages from the discussions. The following key points can be summarised:

1. **The Importance of Global Networking**: Necessity for stronger global collaboration among marine stations was highlighted. Global network such as WAMS could not only enhance resource sharing and capacity building but also improve standardisation of methodologies across different regions. A robust network would facilitate better data sharing, leading to more comprehensive global marine monitoring and conservation efforts.

2. **Challenges of Sustainability and Funding**: A significant focus was placed on the financial sustainability of marine stations. Many stations face threats from reduced funding and a lack of recognition of their vital roles. The need for innovative funding models was discussed, including public-private partnerships and integration of services that could provide both scientific insight and economic benefits, such as eco-tourism and community-engaged research programs.

3. **Technological Advancements in Marine Research**: The application of new technologies such as AI, remote sensing, and big data analytics in marine research was highlighted as a transformative factor for expanding the capabilities of marine stations. However, it was emphasised that there must be equitable access to such technologies, particularly for stations in developing nations or remote locations to avoid widening the technological gap.

4. **Role in Global Policy Influencing**: The unique position of marine stations at the interface of science and society places them in a strong position to influence policy. By providing critical data and research outcomes, marine stations can help shape policies

for sustainable marine management and conservation. It was also noted that marine stations should play a proactive role in international conversations around biodiversity and climate change to ensure that marine issues are adequately represented.

5. **Education and Community Engagement**: Panellists discussed the crucial role marine stations play in education at all levels, from local community awareness to formal university education and public engagement. Strengthening these roles helps to ensure that knowledge about marine environments reaches a broader audience, fostering greater environmental stewardship.
6. **Future Directions and Innovations**: Looking forward, the discussions also cantered on how marine stations could lead innovations in marine science. This includes developing interdisciplinary approaches that merge marine science with other fields such as social sciences to address complex environmental issues holistically.

Detailed Discussion Points:

- Global Collaboration and Standardisation: The need for a more cohesive global strategy emerged as a recurrent theme. The formation of a centralised platform where marine stations could share data, research methodologies, and best practices was suggested to foster uniformity and synergy.
- Adaptive Strategies for Funding: Diverse funding streams were recommended, including engaging more actively with international funding agencies, developing endowment funds, and leveraging alumni networks for investments in long-term sustainability.
- Incorporating Advanced Technology: While the adoption of new technologies is seen as a game-changer, it was also recognised that training and capacity-building initiatives must accompany technology transfers to ensure that all marine stations, regardless of geographical or economic differences, could benefit equally.

In conclusion, the panel discussions at the 2nd World Congress of Marine Stations not only shed light on the existing and latent issues faced by marine stations but also charted a pathway toward more integrated, funded, and technologically equipped marine science infrastructure worldwide. These comprehensive dialogues provided a foundation for developing actionable strategies that could significantly influence the future direction of global marine research and policy.

These insights and recommended actions are crucial as marine stations and their networks continue to adapt and respond to the dynamic challenges posed by global environmental changes. The collective resolve and commitment demonstrated by the participants at the congress underscore an optimistic future trajectory for the global network of marine stations.

Congress Statement

The World Association of Marine Stations (WAMS) is a major effort to mobilise the capacity for marine stations globally, providing a forum for marine stations from all regions of the world to strengthen collaboration and establish inclusive partnerships for the fostering of marine research and education.

WAMS was formally established at the 1st World Congress of Marine Stations held online in November 2021 aligning with the launch of the United Nations Decade of Ocean Science for Sustainable Development (2021-2030). The association was established to address the escalating environmental challenges by leveraging marine sciences, thereby supporting global sustainability efforts.

The 2nd World Congress of Marine Stations, held from 27-29 November 2024 in Shizuoka, Japan (https://sites.google.com/view/wcms2024japan), recognises that the pressures on the ocean due to climate change, pollution, and other anthropogenic factors continue to pose a severe challenge. The need to mobilise resources and capacity on a global scale is therefore more urgent than ever. This resource mobilisation must be inclusive, incorporating all marine stations, including those in least developed countries, as global-scale challenges demand a global-scale response. Marine stations are often at risk due to reductions in funding and/or a failure to recognise their unique role in providing access to the marine environment, supporting critical scientific research, capacity building, and ecological stewardship.

The following key insights emerged from the round-table discussions and plenary sessions during the 2nd Congress:

1. **Marine Stations as Critical Infrastructure:** They offer unique insights due to their long-term presence and integration of new scientific methodologies with traditional knowledge, amplifying their pivotal role in elucidating our understanding of the marine environment. The broad distribution of stations across the globe and breadth of expertise means they are ideally suited to address the 10 challenges for the UN Ocean Decade.

2. **Networking Strengthens Capacity:** A network of marine stations enhances the capabilities of individual stations by creating opportunities for sharing knowledge and resources, which is vital for the development of innovative research methods and for addressing impacts that operate at a global scale including climate change and biodiversity loss.

3. **The Evolving Role of Marine Stations:** New marine stations are increasingly focusing on applied science and in addition to fundamental research and education, offer vital services like data management and technological support for industries, and contributing towards a sustainable blue economy by providing expertise to the local and global communities through consultation and outreach activities.

Commitment to Global Collaboration and Support: WAMS aims to facilitate collaboration, capacity sharing and mobility between stations through its network, online Atlas and

developing centralised information platform, which details infrastructure and resources available at various marine stations globally.

Call to Action: We urge international stakeholders to invest in the stability and expansion of the network of marine stations, supporting their foundational role in marine research, education and societal engagement, and enabling them to address pressing marine and environmental challenges effectively.

Conclusion: WAMS is committed to championing the importance of marine stations and advocating for sustained financial and political support to ensure these vital institutions continue their mission. This support is crucial not only for advancing scientific understanding and conservational efforts but also for aiding global efforts to meet the ambitious targets set for this crucial UN Decade of Ocean Science for Sustainable Development.

Signed,

- Prof Matt Frost, Chair of WAMS, Plymouth Marine Laboratory, UK
- Dr Anna Gebruk, Secretary of WAMS, The University of Edinburgh, UK
- Prof Kazuo Inaba, President of Japanese Association for Marine Biology, Shimoda Marine Research Center, University of Tsukuba, Japan
- Prof Axel EJ Miller, WAMS Management Group Representative, The Scottish Association for Marine Science, UK
- Dr Neil Davies, Director, Gump South Pacific Research Station, University of California Berkeley, French Polynesia
- Prof José A Juanes, Director of Education & Capacity Building, Environmental Hydraulics Institute (IHCantabria), Universidad de Cantabria
- Prof Augusto A V Flores, WAMS Steering Committee Member, Centre for Marine Biology, University of São Paulo, Brazil
- Dr Jani Tanzil, Facility Director, St. John's Island National Marine Laboratory, National University of Singapore, Singapore

Book of Abstracts

The following section of the report includes the conference book of abstracts with detailed programme and abstracts of all oral and poster presentations. The programme is available to download from the congress website.

The 2nd World Congress of Marine Stations

November 27-29th, 2024

GRANSHIP Shizuoka Convention & Arts Centre

Shizuoka, Japan

Contents

Welcome address

Dear WCMS participants,

Welcome to Shizuoka and the first congress of the World Association of Marine Stations to be held in person (the first meeting in 2021 took place during Covid and had to be moved online). This is a great opportunity therefore not just to find out what is happening with marine stations and networks across the globe but also to connect with one another and build foundations for the next stage of WAMS. Marine Stations are a unique resource and a global network of marine stations has the potential to mobilise capacity to meet some of the key ocean challenges of our time.

I would like to thank all those who are contributing to this workshop, the Local Organising Committee and our sponsors. I hope you enjoy the congress and your visit to Shizuoka and look forward to future collaborations!

Matt Frost

Chair, World Association of Marine Stations.

As a representative of the Local Organising Committee, I am delighted to welcome you all here in Shizuoka, Japan, for the first in-person congress of the World Association of Marine Stations, WCMS2024. Marine stations have a rich history, originating as gathering places for scientists to observe and discuss marine life. Like those in Europe and the United States, Japan's marine stations were established long ago. Despite being a small island nation, Japan now has around 80 university-affiliated marine stations, which have significantly contributed to marine biology education and research.

Historically, marine station researchers have collaborated individually and sometimes internationally between two or more stations. However, a functional worldwide association did not exist until the foundation of WAMS in 2010. When you look at the *Atlas*, you'll see that there are over 800 marine stations globally. As our planet faces numerous challenges, international collaboration among marine stations worldwide, each situated along coastlines, holds profound significance. The *Atlas of Marine Stations* was launched long after the initial proposal, and I hope that WCMS2024 plays a role in bringing together people from marine stations featured in the *Atlas*. I hope that this congress offers a valuable opportunity for colleagues to connect face-to-face, engage in vibrant discussions about our shared future, and explore the rich culture of Japan.

Kazuo Inaba

Chair, Local Organizing Committee of WCMS2024

The World Association of Marine Stations (WAMS)

The purpose of World Association of Marine Stations (WAMS) is to provide a forum for marine stations from all regions of the world to establish inclusive partnerships and strengthen collaboration among marine scientists to foster marine scientific research internationally.

WAMS also enables better identification of global capacity and facilitate coordination on a range of issues from education and training to interdisciplinary research and long-term observations. This global network also provides the marine scientific community with a common voice on marine research matters and marine policy, and vitally, helps support global goals for the ocean and provide a stronger voice to champion the role of marine stations.

Congress Overview

The 1st World Congress of Marine Stations (WCMS) in November 2021 resulted in the establishment of a new WAMS Steering Committee and the 'WAMS Communique', stating the importance of the world's marine stations coming together to mobilise scientific capacity to meet key scientific and environmental challenges.

The 2nd World Congress of Marine Stations being held in November 2024 in Shizuoka, Japan is bringing together speakers from a wide range of countries representing marine stations and networks. The aim of the 2nd congress is to build on the momentum established at the WCMS 2021 with key aims congress being:

- To highlight latest developments across the globe in science and outreach being undertaken at a global level and to identify opportunities for international collaboration
- To demonstrate and showcase the unique capacity of marine stations for meeting global challenges and identify opportunities for capacity building
- To further consolidate WAMS as a network through bringing together regional and other pan-national networks, agreeing and establishing new mechanisms for global networking and engagement
- To facilitate engagement with Japanese Marine Stations through site visits

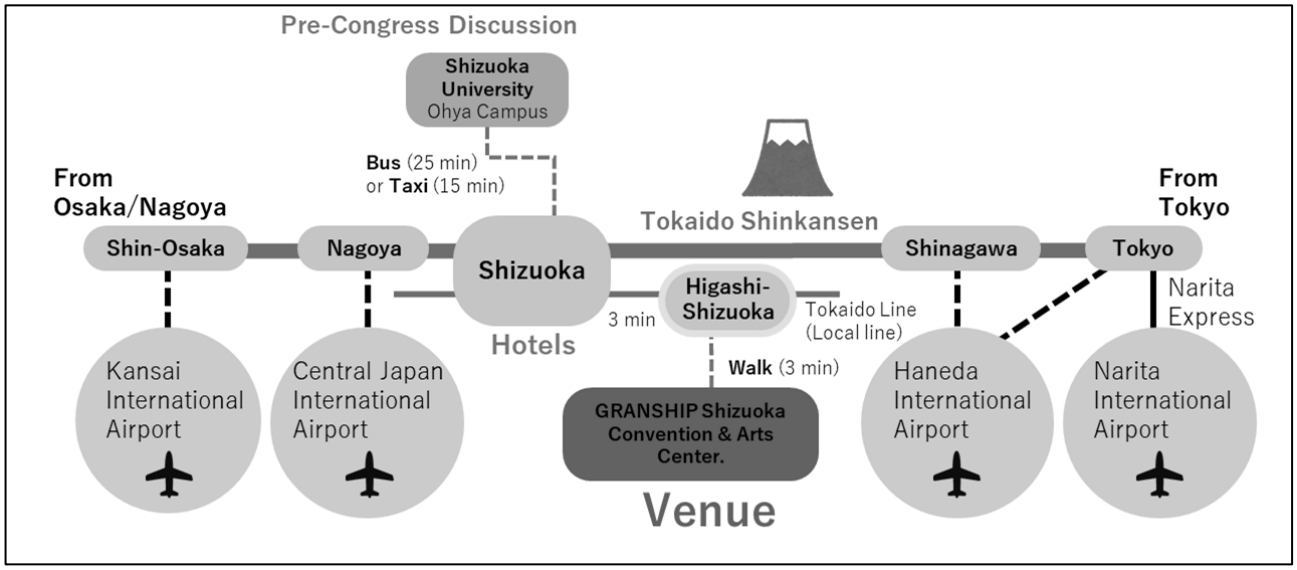
Congress Outputs will include:

- The 'WAMS Declaration' reiterating the need for global cooperation to address Ocean Challenges at a time of global instability and political division
- A conference report highlighting next steps identified at the workshop to inform an implementation plan to further establish WAMS in its role in facilitating international collaboration.
- Updated Steering Committee membership

Venue & Access

All meetings from November 27th:

GRANSHIP Shizuoka Convention & Arts Centre, Conference Room 1001-2



1.From airports to Higashi-Shizuoka Station

1-1. From Narita Airport to Higashi-Shizuoka Station

Step 1: Narita Airport to Tokyo Station

Take the Narita Express (N'EX) from Narita Airport to Tokyo Station. The journey takes about 1 hour.

Step 2: Tokyo Station to Shizuoka Station

At Tokyo Station, transfer to the Tokaido Shinkansen (Hikari or Kodama) and travel to Shizuoka Station. The ride takes about 1 to 1.5 hours.

Step 3: Shizuoka Station to Higashi-Shizuoka Station

At Shizuoka Station, take a local JR Tokaido Line train for one stop to Higashi-Shizuoka Station. This takes about 3 minutes.

1-2. From Haneda Airport (with a transfer at Shinagawa) to Higashi-Shizuoka Station

Step 1: Haneda Airport to Shinagawa Station

Take the Keikyu Line directly to Shinagawa Station. This takes about 15 minutes.

Step 2: Shinagawa Station to Shizuoka Station

At Shinagawa Station, transfer to the Tokaido Shinkansen (Hikari or Kodama) and travel to Shizuoka Station. The ride takes about 1 to 1.5 hours.

Step 3: Shizuoka Station to Higashi-Shizuoka Station

At Shizuoka Station, take a local JR Tokaido Line train for one stop to Higashi-Shizuoka Station. This takes about 3 minutes.

1-3. From Chubu Centrair International Airport to Higashi-Shizuoka Station

Step 1: Chubu Centrair International Airport to Nagoya Station

Take the Meitetsu Line from the airport to Nagoya Station. The trip takes about 30 minutes.

Step 2: Nagoya Station to Shizuoka Station

At Nagoya Station, transfer to the Tokaido Shinkansen (Hikari or Kodama) and travel to Shizuoka Station. The journey takes about 1 hour.

Step 3: Shizuoka Station to Higashi-Shizuoka Station

At Shizuoka Station, take a local JR Tokaido Line train for one stop to Higashi-Shizuoka Station. This takes about 3 minutes.

1-4. From Kansai International Airport to Higashi-Shizuoka Station

Step 1: Kansai International Airport to Shin-Osaka Station

Take the JR Haruka Limited Express or the Kansai Airport Rapid Service to Shin-Osaka Station. This takes about 1 hour.

Step 2: Shin-Osaka Station to Shizuoka Station

At Shin-Osaka Station, transfer to the Tokaido Shinkansen (Hikari or Kodama) and travel to Shizuoka Station. The ride takes about 2 hours.

Step 3: Shizuoka Station to Higashi-Shizuoka Station

At Shizuoka Station, take a local JR Tokaido Line train for one stop to Higashi-Shizuoka Station. This takes about 3 minutes.

2. From Shizuoka Station to Higashi-Shizuoka Station

Most participants will be staying at hotels near Shizuoka Station and making daily trips between Shizuoka Station and Higashi-Shizuoka Station. There are mainly two ways to pay for these trips.

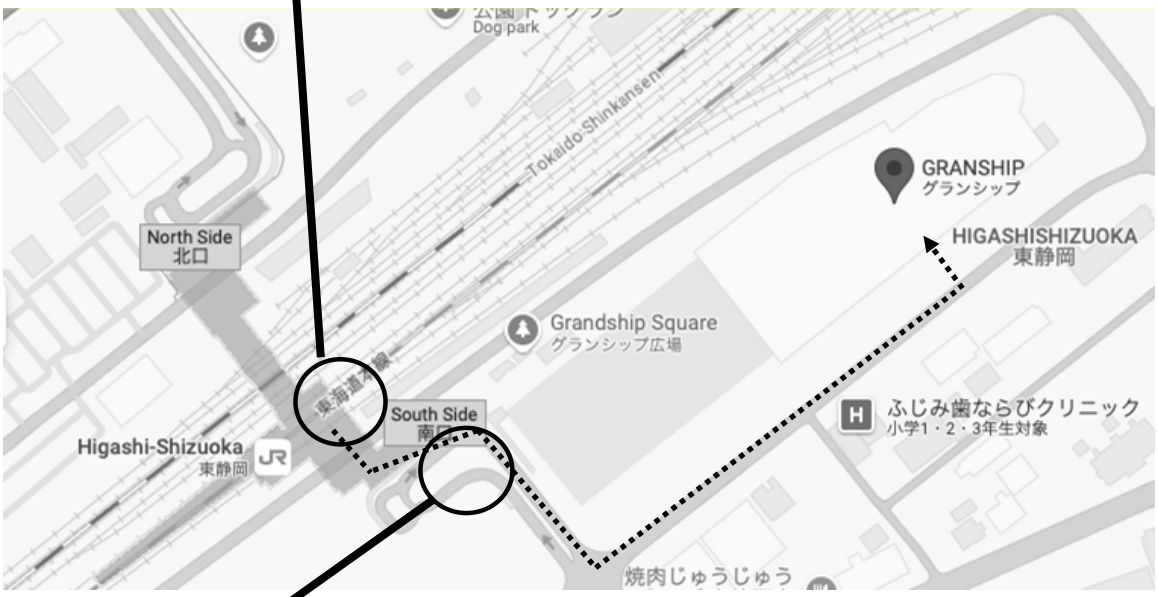
1. Purchase tickets at a vending machine or from a ticket office at the stations for each trip.
2. Purchase a prepaid rechargeable transportation IC card at airports or stations. The IC card can also be used for the bus ride to Shizuoka University, the venue of the pre-congress discussion. Example: “Welcome SUICA” can be purchased at Narita Airport, Haneda Airport, and major train stations in Tokyo.
   https://www.jreast.co.jp/multi/en/welcomesuica/welcomesuica.html

3. From Higashi-Shizuoka Station to GRANSHIP

Step 1: Use the South Side Exit at Higashi-Shizuoka Station.

Step 2: After descending the stairs at the South Side Exit, turn right along the street.

Step 3: Turn left at the traffic light, continue along the street and you will find the main entrance on your left. The walk from the station to GRANSHIP takes about 5 minutes.

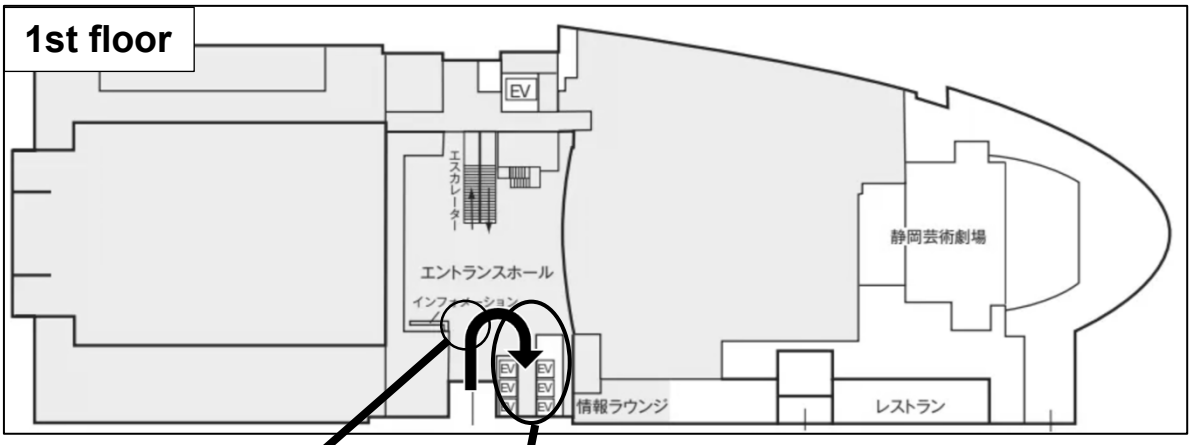


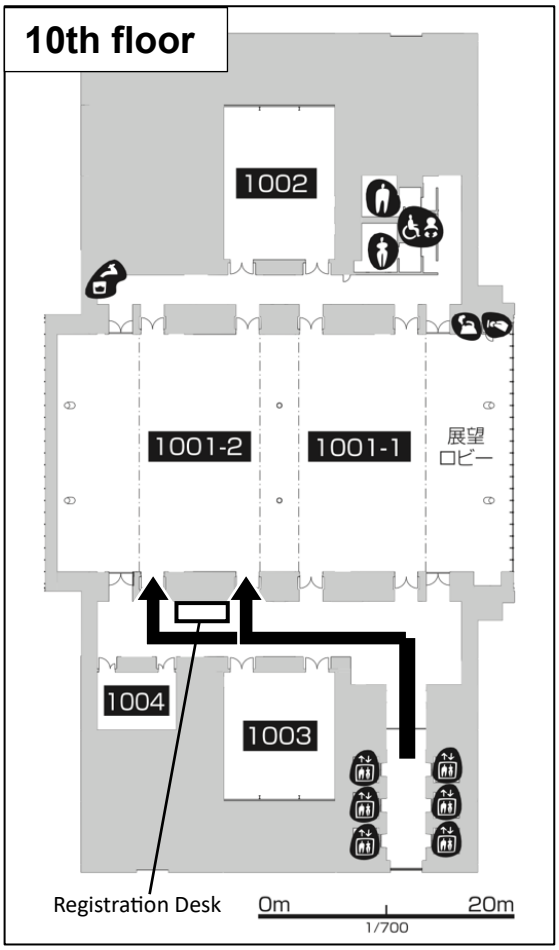
4. Inside GRANSHIP Shizuoka Convention & Arts Centre

Step 1: After entering from the main entrance, turn right and follow the signs to the elevators.

Step 2: Take the elevator to the 10th floor.

Step 3: At the 10th floor, follow the signs to Conference Room 1001-2.





Pre-congress discussion on November 26th:

Shizuoka University Ohya Campus, Faculty of Agriculture, Joint Research Laboratory, Lecture room 2

Address: 836 Ohya, Suruga-ku, Shizuoka-shi, Shizuoka, Japan

From Shizuoka station to Shizuoka University

1. From Shizuoka Station to the Bus Stop

After arriving at Shizuoka Station, exit through the North Exit (Kitaguchi).

Walk to the bus terminal located just outside the North Exit.

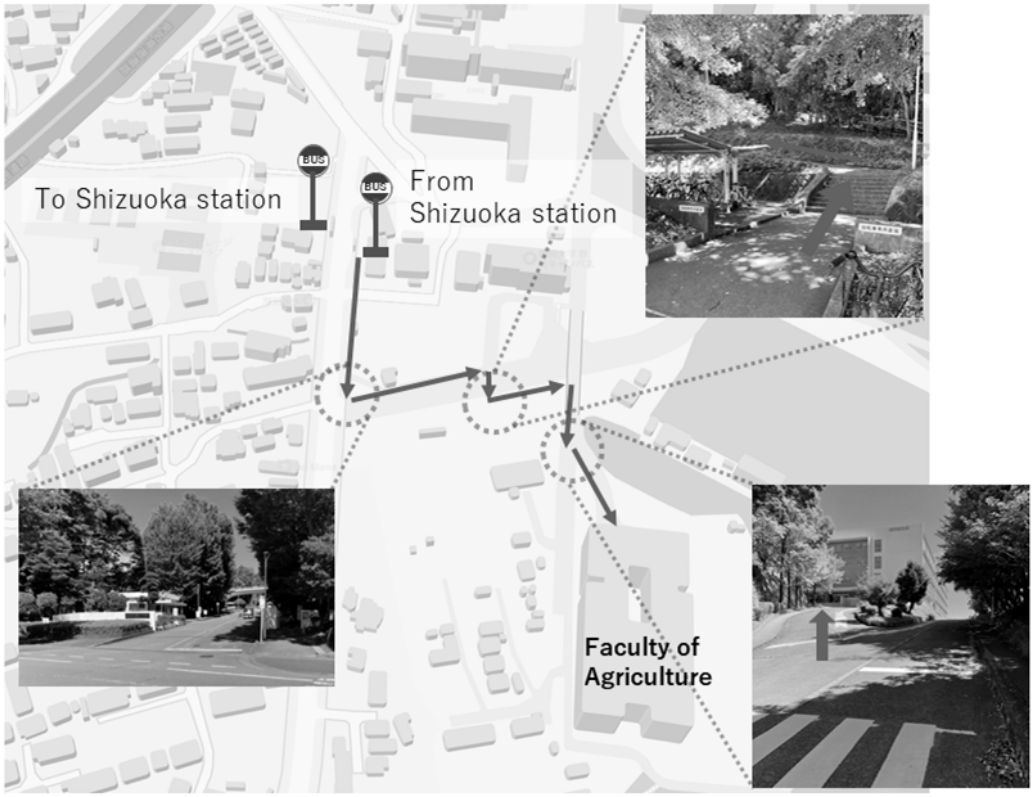
2. Taking the Bus to Shizuoka University

Look for Bus Stop 8B.

Take a bus bound for Shizuoka University. The main buses going to the university are: Bus bound for "Shizuoka Daigaku" (静岡大学)

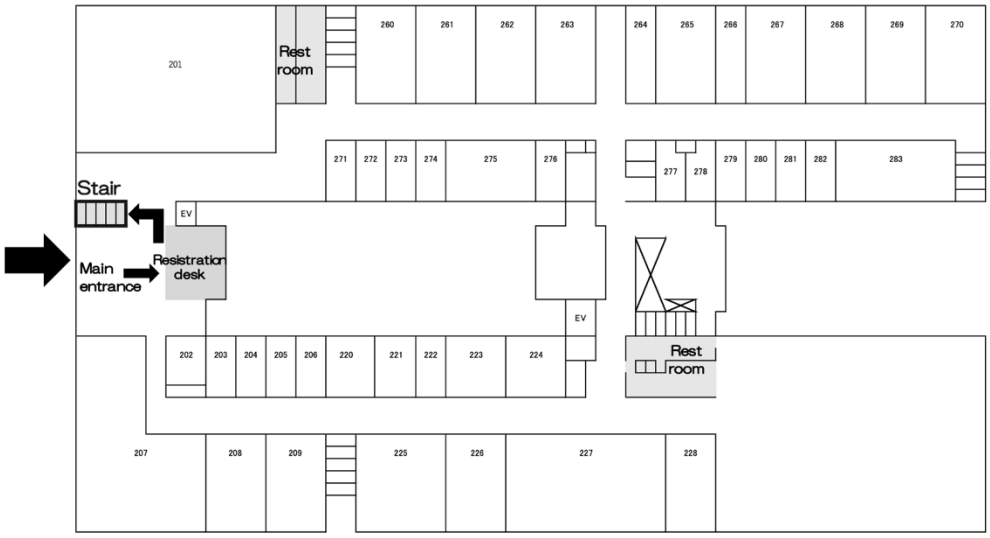
3. Riding the Bus

The bus ride takes about 20-25 minutes. Get off at the Shizuoka Daigaku (静岡大学) stop.

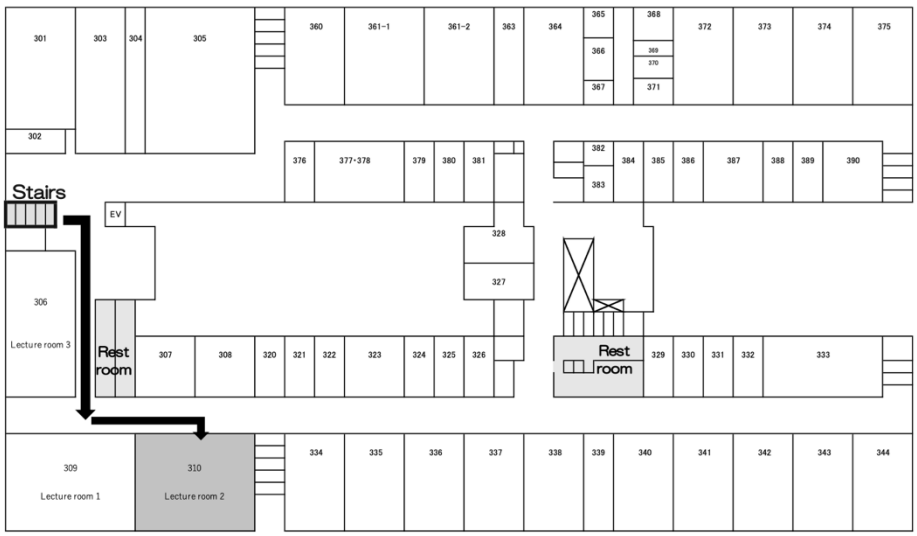


There will be a reception desk just inside the main entrance. Go up one floor and the meeting will be held at Lecture room 2.

Faculty of Agriculture Building 2nd floor



Faculty of Agriculture Building 3rd floor



Conference Dinner on November 29th:

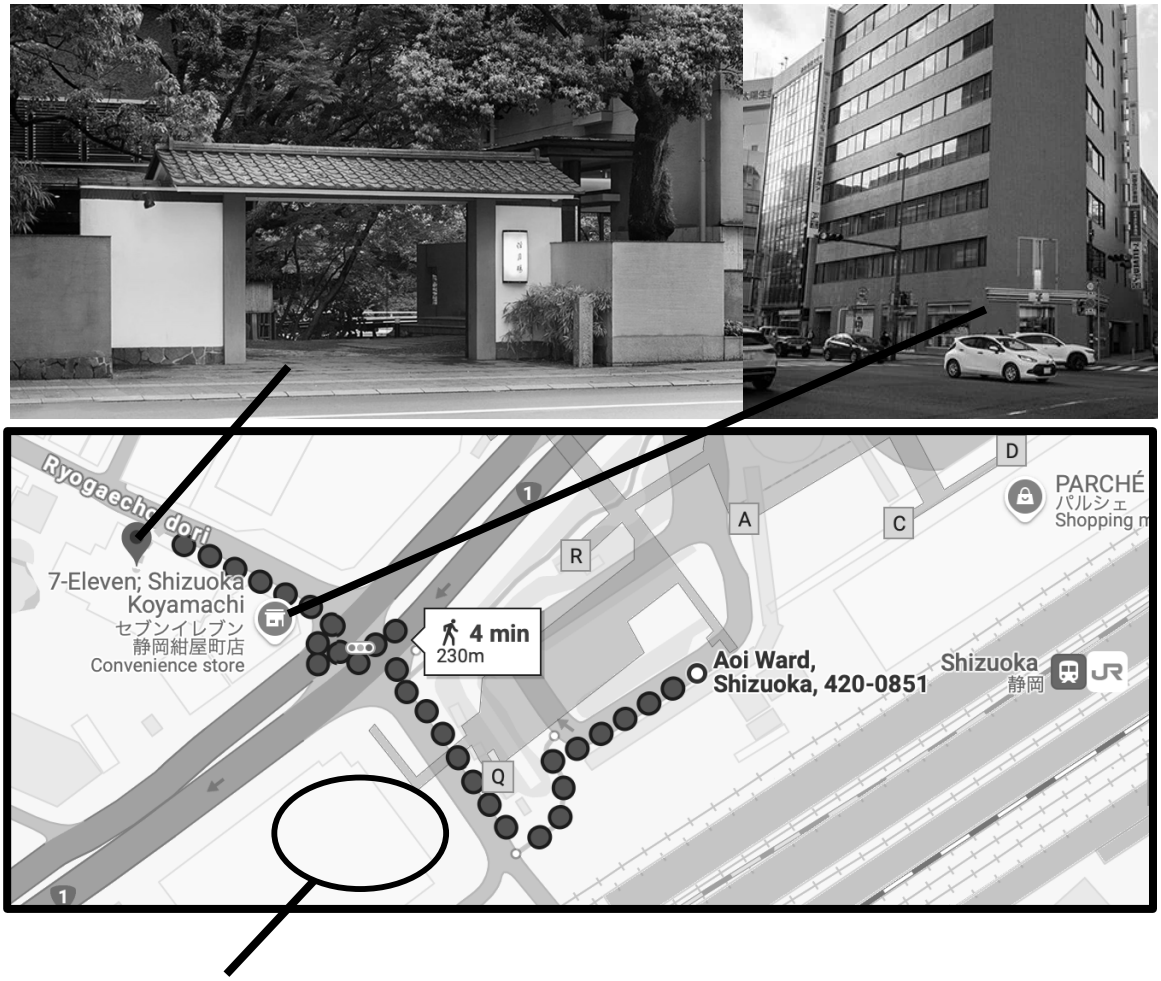
Fugetsuro（浮月楼）

Address: 11-1 Konyacho, Aoi Ward, Shizuoka City, Shizuoka, Japan

From Shizuoka station to Fugetsuro

1. Start from the North Exit of Shizuoka Station
2. Walk toward Concert Hall Shizuoka AOI
3. Cross the National Route 1 to Seven-Eleven
4. Continue along the street (Ryogaecho-dori, 両替町通り) and you will find the entrance gate

Concert Hall Shizuoka AOI



Preparing for Oral Presentations

- You can use your own PC or one that we provide (Windows 11 and Mac).
- Screen aspect ratio is 16:9.
- The Secretariat will prepare an HDMI PC cable connector. If your PC is not compatible with this cable connector, please bring a suitable adaptor.
- Please bring your AC adapter and converter with you.
- Please bring your presentation's backup data on a USB flash drive.
- Please notify the operator in advance if you will be using video or audio in your presentation.
- Please show the logos of WCMS2024 and UN Decade of Ocean Science for Sustainable Development (2021-2030) on your first slide.
- Please test your slides with the operator during the below time:

  Presentations in the morning: 17:30-18:00 on the day before, or 8:45-9:00 on the day of your presentation

  Presentations in the afternoon: 13:00-13:30 on the day of your presentation

Preparing for Poster Presentations

- Prepare your poster to fit on the poster board (W90cm x H180cm). Recommended poster size is A0 size (W841mm×H1189mm).
- Please use the poster board indicated with your poster number.
- Prepare one slide to introduce your poster. The submitted slides will be displayed on screen during the Flash Talk; you will have three minutes to introduce your poster. Slides should be created as PDF files in 16:9 ratio and emailed to wcms2024japan@gmail.com by November 15th. If the file size exceeds 10 MB, it may not be received. Please contact us in that case.
- Please show the logos of WCMS2024 and UN Decade of Ocean Science for Sustainable Development (2021-2030) on your poster.
- Posters can be put up from 16:00 on November 27th. Please take them down before 13:00 on November 29th.
- We will provide pushpins for putting up the posters.

Streaming and Recording of Presentations

- All oral presentations and poster flash talks will be streamed online to registered participants.
- Please note that all oral presentations and poster flash talks will be recorded, with a possibility of limited on-demand distribution.

Instruction for Online Participation

Opening ceremony on Day 1, Sessions 1-4 on Days 2 and 3, Special Session and Flash Talk on Day 2

Registering for the Zoom Meeting

1. We will send the Registration Link only to those who have paid for online participation.
2. Resister for Zoom Meeting using the same name and email address as those used for congress registration. We will approve the registration and send the link to the Zoom site, Meeting ID, and Passcode after confirming that registration is made with the registered name and email address.
3. Make sure to resister before 23:59 on November 26th, Japan time.

Joining the Zoom Meeting

1. Make sure to use the latest version of Zoom application and software.
2. Switch off video when entering Zoom.
3. We will shut off Chat, Voice, and Recording function during the meetings.

Social Media Policy

During WCMS2024, many presentations will feature novel research that is not yet published, and we respect the presenters' right to request that their work not be photographed, recorded, and/or shared across social media. Please make it clear during the talks if any data, research plans or other information need to be kept confidential.

There are no restrictions on dissemination, so we encourage participants to share information about WCMS2024 through their social media accounts. It is the responsibility of the participants to acquire appropriate permission to publish any photographs that feature other participants.

Please note that some images might be taken during the event by the organisers to be used on WCMS, WAMS, and JAMBIO website and social media. Please contact wcms2024japan@gmail.com if you do not give consent to appear on any photos published by the event.

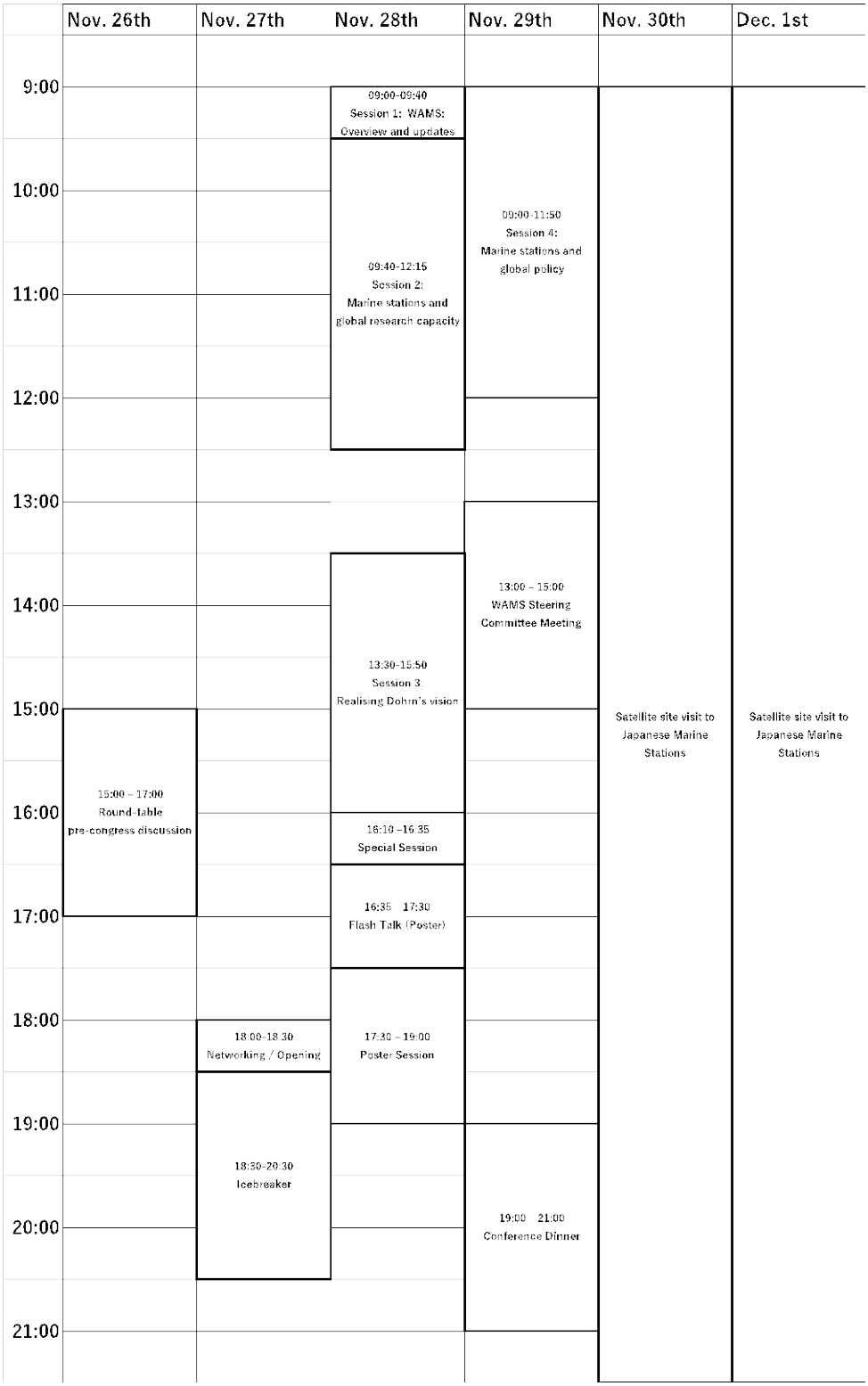
Other Information

- Free WiFi is available at GRANSHIP Shizuoka Convention & Arts Centre. The necessary password will be posted on-site.
- There are lockers at GRANSHIP that you can use with a 100 yen coin. The coin will be returned after use.
- Smoking is prohibited within GRANSHIP. Please use the designated smoking areas outside.

Useful Links

- The 2nd World Congress of Marine Stations
- GRANSHIP Shizuoka Convention & Arts Centre (Congress venue)
- Faculty of Agriculture, Ohya Campus, Shizuoka University (Pre-congress discussion)
- Fugetsuro (Conference Dinner, November 29th)

Schedule


Nov. 26th
Nov. 27th
Nov. 28th
Nov. 29th
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13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
09:00-09:40
Session 1: WAMS:
Overview and updates
09:40-12:15
Session 2:
Marine stations and
global research capacity
09:00-11:50
Session 4:
Marine stations and
global policy
13:00 – 15:00
WAMS Steering
Committee Meeting
13:30-15:50
Session 3:
Realising Dohrn's vision
16:10 –16:35
Special Session
16:35 17:30
Flash Talk (Poster)
17:30 – 19:00
Poster Session
15:00 – 17:00
Round-table
pre-congress discussion
18:00-18:30
Networking / Opening
18:30-20:30
Icebreaker
19:00 21:00
Conference Dinner
Satellite site visit to
Japanese Marine
Stations
Satellite site visit to
Japanese Marine
Stations

Programme

Tuesday 26th November

15:00 – 17:00 **Round-table pre-congress discussion**

(Faculty of Agriculture, Ohya Campus, Shizuoka University)

"Why do we need a Global marine stations network"?

(CHAIR: Matt Frost, Chair, World Association of Marine Stations, Plymouth Marine Laboratory, UK)

Background: The proposal for a World Association of Marine Stations was unanimously endorsed by the IOC and supporting regional and global networks in 2010. Since then, the urgency to support capacity building to address global ocean challenges has increased. This session is an open discussion on current and potential future needs and drivers for a WAMS. We will also discuss the often asked question – what is the definition of a Marine Station in the 21st century?

Wednesday 27th November

09:00 – 18:00 Free time for networking & regional groups meetings

16:00 onwards: Registration (GRANSHIP Shizuoka Convention & Arts Centre)

Networking / Opening

(CHAIR: Kazuo Inaba, University of Tsukuba, Japan)

18:00 – 18:05 Opening address

Kazuo Inaba (Chair, JAMBIO/ University of Tsukuba, Japan)

18:05 – 18:30 Welcome address

Vidar Helgesen (Executive Secretary of the UNESCO-IOC, Video message)

Nobuyoshi Shiojiri (Vice-President, Shizuoka University, Japan)

Matt Frost (Chair, WAMS/ Plymouth Marine Laboratory, UK)

18:30 – 20:30: Icebreaker (with light meals and drinks)

Thursday 28th November

(GRANSHIP Shizuoka Convention & Arts Centre, Conference Room 1001-2)

＊Entrance into GRANSHIP is possible only after 08:45

Session 1: **World Association of Marine Stations: Overview and updates**

(CHAIR: Jani Tanzil, National University of Singapore, Singapore)

09:00 – 09:15

1. The World Association of Marine Stations (WAMS): overview and history
   Matt Frost (Chair, WAMS / Plymouth Marine Laboratory, UK)

09:15 – 09:40

2. WAMS and the Global Atlas of Marine Stations: updates and next steps
   Kazuo Inaba (JAMBIO/ University of Tsukuba, Japan)

   Anna Gebruk (WAMS Secretary/ University of Edinburgh, UK)

Session 2: **Marine stations and global research capacity**

(CHAIR: Anna Gebruk, University of Edinburgh, UK)

09:40 – 11:10 (15 min x 6 Talks)

1. WAMS as an opportunity for small scale cooperation or do we have global projects ahead?
   Alexander Tzetlin (Lomonosov Mocsow State University, Russia)
2. MBON & ML2030: Linking tight networks of marine scientists and practitioners for promoting marine biodiversity monitoring, research and conservation
   Masahiro Nakaoka (Hokkaido University, Japan)
3. IHCantabria: Multidisciplinary Approaches to the Study of Socio-Ecological Coastal Systems
   José A. Juanes (Universidad de Cantabria, Spain)
4. St. John's Island National Marine Laboratory: Singapore's National Research Infrastructure for Marine Science R&D
   Jani Tanzil (National University of Singapore, Singapore)
5. Enhancing Marine Research through Regional Collaboration: Okinawa's Role in a Global Network
   Shannon McMahon (Okinawa Institute of Science and Technology, Japan)
6. 125 Years (Nearly) of the Dove Marine Laboratory: Past, Present and Future
   Heather Sugden (Newcastle University, UK)

11:10 – 11:25 Break

11:25 – 12:15 Plenary discussion and Q&A with panel members:

"What makes marine stations unique in terms of capacity?"

"How do we mobilise this capacity, particularly in and for the global south?"

"What are the upcoming opportunities for international collaboration for research and other activities?"

12:15 – 13:30 Lunch (Japanese lunchbox provided)

Session 3: **Realising Dohrn's vision**

- Marine stations as contributing to regional and global networks

(CHAIR: Sean Rogers, Bamfield Research Station, Canada)

13:30 –15:15 (15 min x 7 Talks)

1. ANEMONE Global: Advancing eDNA-Based Aquatic Biodiversity Monitoring on a Global Scale
   Imane Sioud (Tohoku University, Japan)
2. One-Health Observatory Lighthouse in a little Bay in the Southern Bay of Biscay connected to the world through a database and the European Marine Biological Resource Centre (EMBRC)
   Ibon Cancio (University of the Basque Country, Spain)
3. Collaboration of Tara Océan with Marine Station: A Success Story
   Sylvain Agostini (University of Tsukuba, Japan)
4. Transforming relationships with the ocean through science at Canada's Bamfield Marine Sciences Centre – towards a new frontier for ocean science
   Sean Michael Rogers (Western Canadian Universities Marine Sciences Society, Canada)
5. T-SMART: National Marine Station for Subtropical Estuary-Bay-Coast Continuum Ecosystem
   Bangqin Huang (Xiamen University, China)
6. Commitment to mobility is key to achieve excellence- Lessons from the Centre for Marine Biology of the University of São Paulo (CEBIMar/USP)
   Augusto A. V. Flores (University of São Paulo, Brazil)
7. The Scottish Oceans Institute – Expanding Research Capabilities and Impact through the MASTS (Marine Alliance for Science and Technology for Scotland) Regional Network
   Julie N. Oswald (University of St Andrews, UK)

15:15 – 15:50 Plenary discussion with Q&A panel members:

"How do we network stations at the national to regional level (challenges and opportunities)?"

"What funding mechanisms are available and what are the examples of best practice?"

"How can WAMS help network stations at the global level (challenges and opportunities)?"

"How should WAMS link to and support other global networks?"

15:50 – 16:10 Break

Special Session

(CHAIR: Takako Saito, Shizuoka University, Japan; Kogiku Shiba, University of Tsukuba, Japan)

16:10 –16:20

Promotional Talk from Principal Sponsor

Marine Open Innovation (MaOI) Project from Shizuoka, Japan

- The Sustainable Development of Blue Economy with Ocean Science –

Takashi Gojobori (Director in General, Marine Open Innovation Institute, Japan/ Distinguished Professor Emeritus of Bioscience, King Abdullah University of Science and Technology "KAUST")

16:20 –16:35

Marine Station Management: Lessons from Disasters

After Picking Up the Pieces: Tsunami Damage and Rebuilding of Onagawa Field Center, Tohoku University

Minoru Ikeda (Tohoku University, Japan)

16:35 – 17:30

Flash Talk (Poster) (3 min x 16 posters)

Group Photo

17:30 – 19:00 **Poster Session**

1. The Littoral Station of Aguda in North Portugal – 25 Years of Education and Research
   Mike Weber (Littoral Station of Aguda, Portugal)
2. EMBRC-Spain: two marine stations and a bank of algae sailing the waters of European research infrastructures
   Ibon Cancio (University of the Basque Country, Spain)
3. Okinawa Institute of Science and Technology (OIST) Marine Science Station as a Portal of Regional and International Marine Science Network
   Nobuo Ueda (Okinawa Institute of Science and Technology, Japan)
4. Japanese Association for Marine Biology (JAMBIO): a scientific community from "on-site" fronts covering Japanese marine coast
   Kazuo Inaba (University of Tsukuba, Japan)
5. Aniva Marine Biological Station: Advancing Ecological Research in Sakhalin's Unique Biomes
   Aleksandr Semenov (Lomonosov Moscow State University, Russia)

6. Northwest Florida NaGISA Program: A Thriving Example of Community Collaboration and Student Leadership - Establishing a Framework for Future Program Enhancement
   Jocelyn Wheeler, Noah Stickler

   (NaGISA NW Florida/Niceville High School, USA)

7. Monitoring the Coastal Biodiversity Modulation along the Sandy Beaches of the Northwest Florida Gulf Coast
   Hannah Castor, Sasha McCraine

   (NaGISA NW Florida/Niceville High School, USA)

8. ECIMAT Marine Station, a facility for Genomic Monitoring in Marine Biodiversity: Insights from ARMS
   Jesus Souza Troncoso (University of Vigo, Spain)

9. Environmental DNA Monitoring of Japanese Coastal Waters through Cooperation among Marine Stations
   Masa-aki Yoshida (Shimane University, Japan)

10. Coastal Socio-Ecological System Dynamics in Response to the 2011 Tohoku Earthquake and Subsequent Tsunami
    Toyonobu Fujii (Tohoku University, Japan)

11. Comprehensive Identification and Analysis of Genetic Polymorphisms Regulating Self/Nonself-Recognition in Fertilization
    Hanazaki Kana (Shizuoka University, Japan)

12. Isolation and Structure Determination of a New Antibacterial Lanthipeptide Derived from the Marine-Derived Bacterium *Lysinibacillus* sp. CTST325
    Thetsana Chanaphat (Shizuoka University, Japan)

13. Characteristics of microplastics in different matrices in Jiaozhou Bay, China
    Shan Zheng (Institute of Oceanology, Chinese Academy of Sciences, China)

14. Benthic ecosystem may control jellyfish bloom
    Song Sun (Institute of Oceanology, Chinese Academy of Sciences, China)

15. Long-term changes and ocean health assessment at a typical coastal ecosystem of Jiaozhou Bay, China
    Xiaoxia Sun (Institute of Oceanology, Chinese Academy of Sciences, China)

Friday 29th November

(GRANSHIP Shizuoka Convention & Arts Centre, Conference Room 1001-2)

＊Entrance into GRANSHIP is possible only after 08:45

Session 4: Marine stations and global policy

(CHAIR: Neil Davies, University of California Berkeley, USA)

09:00 – 09:20

Plenary Lecture:

1. Deep-sea Marine Protected Areas and Biodiversity Monitoring
   Katsunori Fujikura (JAMSTEC, Japan)

09:20 –11:50 (15 min x 6 Talks)

2. International collaboration in support of the global ocean agenda: The World Association of Marine Stations (WAMS)
   Matt Frost (Plymouth Marine Laboratory, UK)

3. WAMS Fair Ocean Journal: Operationalizing FAIR and CARE Data Principles in coastal communities worldwide
   Neil Davies (University of California Berkeley, USA)
4. JAMBIO Coastal Organisms Joint Surveys: A network of marine stations and researchers exploring the Japanese coastal biota
   Hiroaki Nakano (University of Tsukuba, Japan)

5. Taking the Pulse of the Global Ocean: An Overview of the Partnership for Observation of the Global Ocean
   Jan Mees (POGO/VLIZ, Belgium)

6. Developing an Ocean Science STEM Hub for the West Coast of Scotland
   Axel E J Miller (Scottish Association for Marine Science)

7. The NWF NaGISA Program as a Blueprint for Scientific Outreach
   Lillian Suttlemyre, Craig Falzone, Jacob Milz, Julia Milz

   (NaGISA NW Florida/Niceville High School, USA)

10:50 – 11:10 Break

11:10 – 11:50 Plenary discussion with Q&A panel members:

"What would WAMS as an implementing partner for the UN Decade look like?"

"How can WAMS support global policy including the BBNJ, the achievement of the SDGs and other targets under CBD?"

11:50 –12:00 Closing remarks

12:00 – 13:00 Lunch (Japanese lunchbox provided)

13:00 – 15:00 **WAMS Steering Committee Meeting**

15:00 – 19:00 Free afternoon / networking time

19:00 – 21:00 **Conference Dinner ('Fugetsuro')**

Saturday 30th November

Satellite site visit to Japanese Marine Stations

Three marine stations will accept visitors for a half-day to 2 days tour after the congress. These visits are for pre-registered participants only.

1. Tateyama station, The Field Science Center of Tokyo University of Marine Science and Technology https://jambio.jp/en/member/tokyokaiyo/

2. Shimoda Marine Research Center, University of Tsukuba https://jambio.jp/en/member/tsukubashimoda/

3. Mukaishima station, Marine Biological Laboratory, Blue Innovation Division, Seto Inland Sea Carbon-neutral Research Center, Hiroshima University https://jambio.jp/en/member/hiroshima/

Abstracts

Oral Presentations on November 28th

Session 1:

World Association of Marine Stations: Overview and updates -1

09:00 – 09:15

The World Association of Marine Stations (WAMS): overview and history

Matthew Frost

Plymouth Marine Laboratory, Prospect Place, Plymouth, UK, PL1 3DH

The World Association of Marine Stations (WAMS) is a mechanism for collaboration between the world's marine stations and marine station networks. The idea for WAMS originally came from a meeting of a number of national and regional networks who came together in 2010 with the support of IOC-UNESCO. A report on the establishment of WAMS was then formally presented to the IOC Assembly and adopted unanimously 4 July 2011 but limited progress was made due to resource issues. At a meeting with IOC-Unesco, Paris, March 2018, the IOC agreed to support a new plan for WAMS in support of Ocean Decade / SDG14 with the (re) launch of WAMS occurring at the 1st World Congress of Marine Stations in 2021.

Today WAMS provides a forum for marine stations from all regions of the world to: foster collaboration through capacity sharing; to provide a common 'voice' to promote the value of marine stations at the international and national level; Support and train the next generation in an equitable manner ("leave no one behind"); promote urgent areas of research / information gaps; and to be a mechanism for science-diplomacy.

Session 1:

World Association of Marine Stations: Overview and updates -2

09:15 – 09:40

WAMS and the Global Atlas of Marine Stations: updates and next steps

Kazuo Inaba[1] and Anna Gebruk[2]

[1] Shimoda Marine Research Center, University of Tsukuba, Shimoda, Shizuoka 415-0025, Japan;
[2]Changing Oceans Research Group, School of GeoSciences, University of Edinburgh EH9 3FE, UK

Marine stations were first established in the mid-19th century, beginning in Europe (with sites like Concarneau, Naples, Plymouth, and Villefranche), Japan (Misaki), and the United States (Woods Hole). Since then, they have spread along coastlines worldwide. Despite the global expansion, only limited attempts had been made to map the many marine stations around the world. In 2014, during a WAMS steering committee meeting in Amsterdam, the idea of a comprehensive *World Atlas of Marine Stations* was proposed. Since then, WAMS has worked to map marine stations globally and compile them into an accessible atlas. In 2017, UNESCO-IOC published the *Global Ocean Science Report: The Current Status of Ocean Science Around the World; Executive Summary*, which included a mapped distribution of nearly 800 marine stations worldwide. With the momentum provided by the United Nations Decade of Ocean Science for Sustainable Development (2021-2030), WAMS set a major objective: to establish an active and interactive *World Atlas of Marine Stations*.

In this session, we invite you to join our presentation on *The World Atlas of Marine Stations*, a comprehensive initiative by the World Association of Marine Stations. This project aims to foster global collaborations by providing a detailed, interactive map of over 830 marine research facilities worldwide. We will introduce new enhancements to the Atlas, including added layers that depict regional networks, enriching its functionality for researchers. We will also detail the process for contributing new entries to the Atlas via our website, encouraging involvement from the global marine research community. This presentation will be an opportunity to understand how *The World Atlas of Marine Stations* serves as a critical tool for enhancing connectivity and collaboration across marine science disciplines.

[1] UNESCO (2017), Global Ocean Science Report—The current status of ocean science around the world, L. Valdés et al. (eds), UNESCO Publishing, Paris

Session 2: Marine stations and global research capacity -1

09:40-09:55

WAMS as an opportunity for small scale cooperation or do we have global projects ahead?

Alexander Tzetlin

Nikolai Pertsov White Sea biological Station. Lomonosov Moscow State University, Faculty of Biology, Leninskie Gory 1-12, Moscow, 119234, Russia

The World Association of Marine Stations (WAMS) has a primary mission to foster cooperation and interaction among marine stations worldwide, encompassing both scientific research and education. As WAMS strives for further development as a global organization, it is crucial to anticipate potential collaborative projects that could involve numerous participating stations.

One of WAMS's priority objectives is monitoring the biological diversity of the coastal ocean. The over 800 reference points scattered globally provide a valuable resource. However, the organization and logistics of such a project are highly complex and necessitate significant diplomatic and financial support. It's essential to recognize that a substantial number of marine stations lack qualified personnel for taxonomic analysis of the full spectrum of marine fauna and flora. While such projects are likely to develop within WAMS, they may not be feasible in the association's initial stages.

Based on the experience of the White Sea Biological Station, operating for over 85 years, we believe two approaches could be more effective:

1. Information Dissemination: It is critical to include more detailed information about marine stations on the WAMS website, and ideally in an interactive atlas. This information should focus on readily accessible research subjects (i.e., species suitable for experimental studies) and biotopes. Such data would be invaluable when planning collaborative projects.
2. Training and Capacity Building: Organizing international schools for early career scientists at biological stations, focused on specific organism groups, would be beneficial. These schools would facilitate the formation of informal research groups from diverse countries, enabling them to pursue projects at marine stations. Furthermore, they provide opportunities for "on-site" training of fauna specialists, as students from the university associated with the biological station typically participate.

Session 2: Marine stations and global research capacity -2

09:55-10:10

MBON & ML2030: Linking tight networks of marine scientists and practitioners for promoting marine biodiversity monitoring, research and conservation

Masahiro Nakaoka[1], Frank Muller-Karger[2], Isabel Sousa Pinto[3], Gabrielle Canonico[4], Mark John Costello[5], J. Emmett Duffy[6], Enrique Montes[7], Aileen Tan Shau Hwai[8], Takehisa Yamakita[9], Adriano Lima[10] and Joana Soares[10]

[1]Akkeshi Marine Station, Hokkaido University, Akkeshi, Hokkaido 088-1113, Japan; [2]University of South Florida, St Petersburg, Florida, USA; [3]University of Porto, Matosinhos, Portugal; [4]National Oceanic and Atmospheric Administration, Silver Spring, Maryland, USA; [5]Nord University, Bodø, Norway; [6]Smithsonian Environmental Research Center, Edgewater, Maryland, USA; [7]National Oceanic and Atmospheric Administration, Miami, Florida, USA; [8]Universiti Sains Malaysia, Penang, Malaysia; [9]Japan Agency for Marine-Earth Science and Technology, Yokosuka, Japan; [10]Atlantic International Research Centre, Açores, Portugal

Human-induced threats are compounding the impacts of climate change on biodiversity. Observations of changes in marine biodiversity across habitats will tell us the pace of change and help predict its impacts on human well-being, including ecosystem goods and services (e.g., coastal protection, water quality, fisheries, aquaculture, carbon capture and storage). The Marine Biodiversity Observation Network (MBON), a thematic node of the Group on Earth Observations Biodiversity Observation Network (GEO BON), plays a key role in this effort. MBON supports marine scientists in developing networks for marine biodiversity monitoring programs. A goal is to popularize guidelines regarding biodiversity within the Essential Ocean Variables (EOV) framework of the Global Ocean Observing System (GOOS), and promoting data publication into the Ocean Biodiversity Information System (OBIS). MBON and collaborations with GOOS and OBIS are the foundation of the Marine Life 2030 (ML2030) program endorsed by the UN Decade of Ocean Science for Sustainable Development. We aim to strengthen the link between MBON and WAMS networks. In this talk, we will present MBON's current activities to explore the current status, gaps, challenges, and opportunities for establishing sustainable biodiversity monitoring. We will particularly focus on the Asia-Pacific region, which harbours the highest marine biodiversity in the world but remains less studied despite being heavily impacted by human activities.

Session 2: Marine stations and global research capacity -3

10:10-10:25

IHCantabria: Multidisciplinary Approaches to the Study of Socio-Ecological Coastal Systems

Jose A Juanes

Environmental Hydraulics Institute o the University of Cantabria (IHCantabria), 39005 Santander, Spain

The recent consideration of marine ecosystems as part of complex socio-ecological systems has led to a paradigm shift in marine station research, which faces new objectives and challenges. Recent technological advances, in fields as diverse as genomics, remote sensing, ecological modelling and artificial intelligence, justify the emergence of multidisciplinary centers in which marine ecosystems represent both the objective, the problem and the solution. So, complementing classical biological station research with cross-disciplinary approaches, including engineering and social sciences, arises as an opportunity.

The Environmental Hydraulics Institute (IHCantabria) is a multidisciplinary research hub on the marine environment (N-Spain), providing specialized knowledge funded by public international agencies (e.g. EUAid, UNDP, Int. Development Agencies) and private companies worldwide. Research, Tech-Transfer and Training represent the three pillars that define its mission. Addressed challenges include, among others: Ecological processes; Biodiversity management; Risk assessment; Climate Change; Marine Planning; Renewable Energies. Since 2007, it has developed more than 1000 R&D projects (60 countries). During 2023, 158 research and transfer projects were developed in 22 countries, combining field work, remote observation, lab and field experimentation and modelling of Ph-Ch and Biological processes of coastal and marine ecosystems. It is important to highlight the important contribution of IHData, a database that provide historical and projected meteo-oceanographic information worldwide.

R&D is complemented by both the training of MSc (40 st/yr) and PhD researchers (IH2O program: 40 predocs, 14 countries) and the annual reception of 30 undergraduate and graduate trainees. It is also worth highlighting IHCantabria's commitment to Continuing Education, offering specialized courses and diplomas through the ECCE-IH platform.

Session 2: Marine stations and global research capacity -4

10:25-10:40

St. John's Island National Marine Laboratory: Singapore's National Research Infrastructure for Marine Science R&D

Jani Tanzil, Ahmed Aliyar

St. John's Island National Marine Laboratory, Tropical Marine Science Institute, National University of Singapore

Singapore has had a long history in marine biology research, with attempts at establishing an offshore marine research facility in Singapore that began in the 1950s. It was not until 2002 that the Tropical Marine Science Institute (TMSI), National University of Singapore (NUS) successfully established a facility on St. John's Island that still stands today. This facility remains Singapore's first and only offshore marine science research facility, which has now been re-established as the St. John's Island National Marine Laboratory (SJINML) in 2016 as a National Research Infrastructure (NRI) in recognition of the need for Singapore to better understand the waters that surrounds her limited land mass. This talk will share more about the SJINML, its current status as an NRI as well as its long-term goals and vision for supporting marine science research in Singapore and beyond.

Session 2: Marine stations and global research capacity -5

10:40-10:55

Enhancing Marine Research Through Regional Collaboration: Okinawa's Role in a Global Network

Shannon McMahon

Marine Science Section, Okinawa Institute of Science and Technology, Onna-son, Okinawa, Japan

Okinawa, with its rich marine biodiversity and strategic location, serves as an important hub for marine research in the Asia-Pacific region. The Okinawa Institute of Science and Technology (OIST) and other marine stations on the island play a crucial role in advancing global marine science through regional and international collaboration. This talk highlights Okinawa’s contributions to innovative research on cephalopod behaviour and reproduction, climate change impacts on coral reefs, marine biophysics, evo-devo, and sustainable aquaculture in partnership with local fish farms.

Key conservation efforts, such as the Clownfish Restoration Project with Hyatt and the genomic-based OIST Coral Project, underscore the island's commitment to preserving marine ecosystems through public-private partnerships. Additionally, Okinawa’s marine stations are instrumental in fostering educational outreach programs that engage Okinawan and Japanese schools and broader public awareness campaigns aimed at promoting marine conservation.

By leveraging regional networks and collaborating with external researchers, Okinawa enhances the global capacity for multidisciplinary marine science research. This model of regional collaboration not only supports sustainable development goals but also demonstrates how marine stations like those in Okinawa contribute to addressing global environmental challenges.

Session 2: Marine stations and global research capacity -6

10:55-11:10

125 Years (Nearly) of the Dove Marine Laboratory: Past, Present and Future

Heather Sugden, Sarah Banks, and Pip Moore

The Dove Marine Laboratory, School of Natural and Environmental Sciences, Newcastle University, Front Street, Cullercoats, North Shields, NE30 4PZ

The Dove Marine Laboratory (DML) has been part of Newcastle University (and its precursors) since 1908, where it has been at the forefront of marine research, teaching, and outreach. Initially established to understand and manage local fish stocks, the DML is home to the UK's oldest single station plankton time series (Dove Time Series) and today still plays a vital role in tackling the scientific challenges affecting our marine ecosystems. Located adjacent to conservation sites, DML allows students to study habitats recovering from historical industrial pollution, providing invaluable learning experiences.

Researchers at DML are actively collaborating on an international level, with aspirations to further strengthen connections outside the UK. These efforts aim to enhance capacity-building initiatives, research capabilities, data sharing, exchange programs, and knowledge dissemination. DML is committed to expanding its regional and national networking events into global activities, fostering a broader exchange of ideas and best practices.

The laboratory plays a crucial role in the community, through ocean science education with international NGOs, (summer schools and careers) citizen science projects co-created with hard-to-reach local groups such as refugees, LGBTQ+ individuals, and those from lower socio-economic backgrounds.

Operating through a combination of university funding, grants, and partnerships with governmental and non-governmental organizations, DML faces challenges in securing consistent funding, particularly for long-term projects and infrastructure upgrades. Innovative funding models, including public-private partnerships and community fundraising, are being explored to ensure financial sustainability.

Here, we present the past, present, and future directions of DML, with the hope of creating strong collaborative links with like-minded marine stations worldwide. By doing so, we aim to continue our legacy of impactful marine research and engagement.

Session 3: Realising Dohrn's vision

- Marine stations as contributing to regional and global networks -1

13:30-13:45

ANEMONE Global: Advancing eDNA-Based Aquatic Biodiversity Monitoring on a Global Scale

Imane Sioud[1], Yuki Minegishi[2], Tadashi Kajita[3], Yukinobu Isowa[4], Michio Kondoh[5,6].

[1] Tohoku University, Miyagi, Japan; [2] University of Tokyo, Tokyo, Japan; [3] University of the Ryukyus, Okinawa, Japan; [4] University of the Ryukyus, Okinawa, Japan; [5] Tohoku University, Miyagi, Japan; [6] WPI-AIMEC, Miyagi, Japan

Since its inception in 2019 in Japan, the All-Nippon Environmental DNA Monitoring Network (ANEMONE) has conducted extensive nationwide aquatic biodiversity assessments using environmental DNA (eDNA) technology. Originally a local initiative, ANEMONE has since expanded to encompass a global network, enabling international collaboration to refine biodiversity monitoring methods and unify data collection practices across diverse marine environments. The first global survey, conducted in late 2024, engaged 18 groups from 12 countries within the Indo-Pacific, primarily targeting fish species. This pilot phase provides foundational data and insights critical to future biodiversity monitoring at larger scales. ANEMONE's phased implementation supports the establishment of regular sampling locations and regional hubs, which are intended to streamline and eventually localize data processing. Currently, samples are centralized for analysis in Japan to maintain methodological consistency; however, plans for decentralized processing aim to further regional engagement and capacity. This approach has proven effective for large-scale species detection, even in remote areas, yet the expansion comes with challenges. Establishing consistent protocols, engaging local stakeholders, and managing logistical complexities remain key obstacles in maintaining a robust and sustainable network.

Community involvement and education are core to ANEMONE's impact. Through workshops, citizen science, and outreach efforts, ANEMONE builds inclusive partnerships that enhance data quality and accessibility. Open data-sharing practices foster transparency and encourage broad application of findings among researchers, policymakers, and conservation bodies. As ANEMONE grows, it aims to provide meaningful insights into biodiversity trends and support global conservation priorities, contributing to the resilience of marine ecosystems in the face of climate change and biodiversity loss.

Session 3: Realising Dohrn's vision

- Marine stations as contributing to regional and global networks -2

13:45-14:00

One-Health Observatory Lighthouse in a little Bay in the Southern Bay of Biscay connected to the world through a database and the European Marine Biological Resource Centre (EMBRC)

Ibon Cancio, Oihane Diaz de Cerio, Ionan Marigomez, and Nestor Etxebarria

Research Centre for Experimental Marine Biology and Biotechnology (PiE-UPV/EHU), University of the Basque Country and EMBRC-Spain, Areatza 47, E-48620 Plentzia, Basque Country, Spain

The "One-Health" concept, globally adopted by the scientific and political communities, implies that connections existing between living organisms and their shared environment are essential for well-being. Thus, human health, animal/plant health and ecosystem health are interdependent. Under such concept, and taking advantage of the involvement of the marine station PiE-UPV/EHU in EMBRC´s "European Marine Omics Biodiversity Observation Network, EMO-BON" endorsed by the UN Ocean Decade, all PiE-UPV/EHU researchers joined forces. Multidisciplinary expertise in marine ecology, plankton/benthos taxonomy, cell and molecular biomarkers of pollution exposure, omic technologies, microbiology, environmental antibiotic resistance, analytical chemistry, meteorology, satellite modeling, and socio-economic development assessment have been deployed to analyse the health status of the Plentzia Bay in the context of climate change and the antibiotic resistance crisis. This Bay in the Southern Bay of Biscay receives the waters of one river, with a beach that houses the summer residence of many tourists and one of the largest hospitals in the region. Water in the Bay and its estuary was sampled monthly in 2023 or every 3 months in 2024 for the analysis of chemical profiles, *Vibrio* content, total bacteria activity, fito- and zoo-plankton diversity, pigment content and metagenome. In addition, molluscs are sampled for histopathological, pollution biomarker and chemical bioaccumulation analyses. Beach use is also studied while the socioeconomic reality of the basin is monitored through questionnaires. This "observatory lighthouse" aims to share expertise to offer holistic One-Health solutions whenever ecosystems in the land-sea interphase might be impacted. All data contributes into a common database also connected to the EMO-BON biodiversity observatory with omic data of 19 European marine sites. Through data sharing, we fulfill Aton Dohrn´s dream of "a global interconnected network of marine stations".

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Session 3: Realising Dohrn's vision

- Marine stations as contributing to regional and global networks -3

14:00-14:15

Collaboration of Tara Océan with Marine Station: A Success Story

Sylvain Agostini[1,2], Yumiko Patouillet[2], Jonathan Ramtahal[1], Shigeki Wada[3], Romain Trouble[4] and Etienne Bourgois[4]

[1] Shimoda Marine Research Center, University of Tsukuba, Shimoda, Shizuoka 415-0025, Japan; [2] Tara Ocean Japan, c/o agnes b. Japan Inc. 8F, Shin-Meguro Tokyu Building, 2-25-2 Kamiosaki, Shinagawa--ku, Tokyo, Japan, [3] Seto Inland Sea Carbon-neutral Research Center, 1-3-2 Kagamiyama, Higashi-Hiroshima City, Hiroshima, Japan; [4] 8 R. de Prague, 75012 Paris, France

The first foundation in France to be recognised as promoting the public interest dedicated to the ocean, founded by Agnès Troublé called agnès b. in 2003 and chaired by Etienne Bourgois, the Tara Océan Foundation is leading a scientific revolution around the ocean ecosystem. It uses high level scientific expertise and sea voyages to raise awareness and educate young people and the public in general, to mobilise political decision makers at the highest level and to enable developing countries to access this new knowledge about the Ocean. In 2016, Tara Océan Japan was created to develop local projects and follows the same mission: to develop innovative and original open ocean science which, in the future, will enable us to predict anticipate and better understand climate risks and better protect biodiversity.

The schooner Tara, a floating laboratory for the study of the ocean, allows to access even the most remote parts of the high seas. Nevertheless, the coastal ocean, where human activities have the strongest impact on the ecosystems remain an important areas of research for Tara Ocean. Combining their strengths, Tara Océan has collaborated with hundred of marine stations during the Tara Europa mission, part of the TREC expedition to study the land-sea interface where biodiversity meets numerous pollution. In Japan, Tara Océan Japan has collaborated with the JAMBIO network to study the microplastic pollution in Japanese coastal waters and sediments. The Tara Jambio Microplastic Survey investigated the abundances, pathways and fates of microplastic in 14 locations around Japan, from Hokkaido to Okinawa. It highlights the omnipresence of microplastic pollution, the accumulation of microplastic in sediment and the urgent need for a better management of waste from urban areas and aquaculture activities. From 2024, Tara Océan Japan is again collaborating with the JAMBIO network for a Japan wide survey on macroalgal and seagrass ecosystems to better understand their potential for "blue carbon" and their role in supporting biodiversity in coastal waters.

Session 3: Realising Dohrn's vision

- Marine stations as contributing to regional and global networks -4

14:15-14:30

Transforming relationships with the ocean through science at Canada's Bamfield Marine Sciences Centre – towards a new frontier for ocean science.

Sean M. Rogers [1,2]

[1] Bamfield Marine Sciences Centre, British Columbia Canada; [2] University of Calgary, Biological Sciences, Alberta, Calgary, Canada

The Pacific Marine Science Alliance (PMSA) is a unique marine sciences partnership across five western Canadian universities (University of British Columbia, University of Alberta, University of Calgary, Simon Fraser University and University of Victoria) with a permanent base for marine and coastal-oriented field operations at the Bamfield Marine Sciences Centre (BMSC). Perched on the outer west coast of Canada, the BMSC is the epitome of realizing Dohrn's vision to (1) provide unparalleled ocean access to remarkable biodiversity, (2) contribute to regional and global networks and collaborations, and (3) support the infrastructure and operations of modern marine stations. With support from the Canada Foundation of Innovation, the PMSA recently launched EMPOWER, a new research and training program to measure ocean weather and predict ecological response in near shore environments, in addition to a new marine science curriculum. In this talk I will highlight research opportunities for collaboration, and the role of PMSA for building and supporting Dohrn's vision for ocean science globally.

Session 3: Realising Dohrn's vision

- Marine stations as contributing to regional and global networks -5

14:30-14:45

T-SMART: National Marine Station for Subtropical Estuary-Bay-Coast Continuum Ecosystem

Banggin Huang

National Observation and Research Station for the Taiwan Strait Marine Ecosystem,

Xiamen University, Xiamen 361102, China

The National Observation and Research Station for the Taiwan Strait Marine Ecosystem (T-SMART) is situated on west coast Taiwan Strait, Fujian, China. T-SMART is a field platform of Xiamen University that makes observations and research on subtropical coastal ecosystems. It consists of two comprehensive substations: the Dongshan Swire Marine Station and the Zhangjiang Estuary Mangrove Wetland Ecosystem Station. With the goal of establishing an integrated and interdisciplinary platform, T-SMART has made numerous efforts in observation, research, education, and outreach through international, regional and domestic collaboration over the years.

T-SMART has developed connection with various international marine institutions, such as Hopkins Marine Station, the Darling Marine Center, Stazione Zoologica Anton Dohrn, the IOES Bachok Marine Research Station, Virginia Coast Reserve LTER and Georgia Coastal Ecosystems LTER. These connections are facilitated by members of International Adviser Committee for the T-SMART.

T-SMART has developed close collaboration with regional marine stations such as the Swire Institute of Marine Science (SWIMS), the University of Hong Kong, and the Institute of Marine Environment and Ecology, Taiwan Ocean University. The collaboration included joint observation, research, students exchange and workshop. In addition, T-SMART collaborates closely with SWIMS on joint Ph.D and postdoctoral fellowship program.

T-SMART was connected with domestic marine stations in Mainland China through joint research collaboration and data sharing. In addition, T-SMART worked with Shenzhen Institute of Advanced Technology (SIAT), CAS to develop an underwater zooplankton imager application system, and has successful collaboration.

Session 3: Realising Dohrn's vision

- Marine stations as contributing to regional and global networks -6

14:45-15:00

Commitment to mobility is key to achieve excellence- Lessons from the Centre for Marine Biology of the University of São Paulo (CEBIMar/USP)

Augusto A. V. Flores

Centre for Marine Biology, University of São Paulo, São Sebastião, SP, 11612-109, Brazil

From its establishment, nearly 70 years ago, up to the present, the CEBIMar-USP transitioned from a marine station mostly supporting USP visitors and international experts in the field, to a self-managed center hosting a vibrant group of resident faculty, post-docs and students. We are currently well equipped for field work along the São Sebastião Channel and adjacent seas, including key marine protected areas in the region, from the intertidal zone to mesophotic systems up to 150 m deep, thanks to a recently established technical diving center. We also provide laboratory facilities that support science projects in the main fields of Marine Biology, including equipment for advanced oceanographic / meteorological monitoring, molecular analyses or controlled conditions for experimental research. International collaboration, including active participation in worldwide scientific networks, has been instrumental in our path towards a world-class facility. Informed criteria of partner marine stations may be used to craft upcoming programs of academic interchange – graduate student mobility in particular – as an overall cost-benefit strategy to advance empirical marine science and tight academic agreements between institutions around the globe. Several of the marine stations mapped by WAMS may well engage in a broad agreement to subsidize visiting student internships, eventually through a credit system benefiting all parts.

Session 3: Realising Dohrn's vision

- Marine stations as contributing to regional and global networks -7

15:00-15:15

The Scottish Oceans Institute – Expanding Research Capabilities and Impact through the MASTS (Marine Alliance for Science and Technology for Scotland) Regional Network

Julie N. Oswald[1], David Ferrier[1], Mark James[1,2], David M. Paterson[1,2]

[1]Scottish Oceans Institute, University of St Andrews, St Andrews, UK, KY16 8LB; [2]Marine Alliance for Science and Technology for Scotland (MASTS), Scottish Oceans Institute, St Andrews, UK, KY16 8LB

The Scottish Oceans Institute (SOI) at the University of St Andrews is an interdisciplinary marine research and teaching institute that brings together researchers from the Schools of Biology, Earth and Environmental Sciences, Geography and Sustainable Development, and Mathematics and Statistics. A major aim of the SOI is to contribute towards understanding and managing the future of our oceans by creating and participating in both regional and global networks. As such, we are the home of the directorate of the Marine Alliance for Science and Technology for Scotland (MASTS). MASTS is comprised of over 700 researchers across 18 partner institutions and 11 research forums. The goals of MASTS and the SOI are to foster collaboration and communication within the marine research community, support informed policy making, educate and engage the public on the invaluable heritage of Scotland's marine environment, champion wealth creation and environmental protection through scientifically sound practices, and nurture the next generation of marine researchers and leaders through the SOI Marine Biology program and the MASTS graduate school. MASTS is now gradually expanding beyond Scotland with the recent addition of Essex University to its membership, and other UK institutions may soon follow. MASTS also acts as a major conduit for establishment of international links (e,g European Marine Board representation) and collaborations to enhance the global interactions of Scottish marine scientists. Here we highlight how participation in the MASTS network promotes excellence in marine research at the SOI in Scotland and beyond.

Special Session:

Marine Station Management: Lessons from Disasters

16:20-16:35

After Picking Up the Pieces:

Tsunami Damage and Rebuilding of Onagawa Field Center,

Tohoku University

Minoru Ikeda[1,2]

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A massive tsunami generated by the Tohoku-Pacific Ocean Earthquake that struck at 14:46 (UTC+9) on March 11, 2011 hit a wide area along the Pacific coast from the Tohoku region to the Kanto region, causing extensive damage. Onagawa Field Center of Tohoku University, located at the base of the Oshika Peninsula in Miyagi Prefecture, is a facility for practical education on mainly fisheries science. This facility, first built in 1933 and reconstructed in 1997, was also hit by the tsunami. The entire facility was completely submerged by the tsunami with a height nearly 10 m and all of the equipments were ruined. At that time, 11 people including staff members were staying at the center, fortunately they were able to evacuate and there were no casualties. The Pacific coast of the Tohoku region, including Onagawa Town, has been hit by huge earthquakes and tsunamis in the past, and although we had taken precautions, the scale of the disaster was greater than our prediction, and the safe of the staff members and visitors there was largely due to coincidence. Thereafter, the new facility was completed in 2014 with the support of the government's reconstruction budget, and we are now able to perform our educational and research activities without difficulty. This presentation will introduce the tsunami damage of our field center and the current precautions implemented based on the learning from the disaster. I hope that this presentation will be of some help to marine stations in Japan and other countries that are located in areas where natural disasters can occur.

Abstracts

Poster Presentations on November 28th

Poster -1

The Littoral Station of Aguda in North Portugal –

25 Years of Education and Research

Mike Weber, Jaime Prata, Assunção Santos & Ruben Pinho

Estação Litoral da Aguda ELA

Praia da Aguda, 4410-475 Arcozelo / VNG

Portugal

The Littoral Station of Aguda (ELA) is located in the municipal area of Vila Nova de Gaia, on the beach of Aguda, a small fishing village 15 km south of Porto. The station integrates a Fishery Museum, an Aquarium and a Department for Education and Research. ELA belongs to the municipal firm *Águas de Gaia* and is linked to the Institute of Biomedical Sciences *Abel Salazar* (ICBAS) of the University of Porto. Opened to the public in July 1999, the station has so far received more than 460.000 visitors.

The Museum gives an insight to local and global artisanal fishery, and the Aquarium displays the adjacent aquatic fauna and flora, with special emphasis on marine species of interest for the local fishery.

ELA´s environmental education programs are available for all pedagogical levels, covering all age groups, from nursery school to university.

The rocky coastline in front of the station, its characteristic marine species, the fishing boats and the local fish market play a significant role for education and research. A long-term research project concerning the experimental fishery, mark, recapture and cultivation of the European lobster (*Homarus gammarus*) started in 2006 and is still underway.

Since the beginning of ELA´s project in 1989, 30 books, 80 articles, and other information material have been published. Additionally, 27 Internships, 12 MSc and three PhD theses on various topics of Marine Ecology, Aquaculture and Fisheries, have been supervised during the past 25 years by ELA´s team.

Poster -2

EMBRC-Spain: two marine stations and a bank of algae sailing the waters of European research infrastructures

Ibon Cancio[1], Ionan Marigómez[1], Xabier Lekube[1], Oihane Diaz de Cerio[1], Antera Martel[2], Ignacio Gonzalez[2], Juan Luis Pinchetti[2], Daniel Rey[3], Jose Manuel Estevez[3], Estefanía Paredes[3], and Maria Huete-Ortega[3]

[1]Plentzia Marine Station (PiE-UPV/EHU), University of the Basque Country; [2]Spanish Bank of Algae (BEA-ULPGC), University of Las Palmas de Gran Canaria; [3]Toralla Marine Science Station (ECIMAT), Marine Research Centre (CIM), University of Vigo.

EMBRC-Spain (https://www.embrc.es/) is the Spanish node of the European Marine Biological Research Centre (EMBRC), a research infrastructure (RI) that provides access to marine bioresources and research services for academics, industry and society in general. EMBRC-Spain gathers three marine research centers offering complementary marine biology services: Toralla Marine Science Station (ECIMAT-CIM/UVigo), Plentzia Marine Station (PiE-UPV/EHU) and the Spanish Bank of Algae (BEA-ULPGC). Its mission, aligned with that of EMBRC, consists in:

- Supporting marine biological research/innovation by serving the research community with up-to date research services
- Providing access to ecosystems, biological resources and research platforms, developing also new enabling technologies.
- Promoting technological transfer towards fostering a European Blue Bioeconomy.
- Preserving biodiversity by promoting compliance with ABS regulations.

Since 2017, EMBRC-Spain has participated in 10 European RI projects and 3 Interreg Atlantic Area and 2 national networking projects. EMBRC-Spain manages two of the 19 biodiversity observatories that conform EMBRC´s European Marine Omics Biodiversity Observation Network (EMO-BON) endorsed by the the UN Decade of Ocean Science for Sustainable Development. EMBRC-Spain offers 53 different research services that have been accessed by international researchers through more than 35 "transnational access projects". In addition, the PiE-UPV/EHU was one of EMBRC´s super-stops for the 2023-2024 European coastal expedition EMBL-TREC, hosting over 50 researchers for 6 weeks.

EMBRC Spain is also dedicated to fostering the creation of active and dynamic Regional Blue Innovation ecosystems through the regional embedding of its operators: ECIMAT-CIM/UVigo in Galicia and the North-Portugal-Galicia Euroregion, PiE-UPV/EHU in Basque Country and the Basque Country-Navarre-New Aquitaine Euroregion, and BEA-ULPGC in Canary Islands and the Macaronesian region.

Acknowledgements: Grant RED2022-134928-E funded by MICIU/AEI/ 10.13039/501100011033. Basque Gov. fund to PiE-UPV/EHU to participate in EMBRC.

Poster -3

Okinawa Institute of Science and Technology (OIST) Marine Science Station as a Portal of Regional and International Marine Science Network

Nobuo Ueda and Shannon McMahon

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Established in 2016, OIST Marine Science Station (OMSS) is located in the middle of subtropical island, Okinawa Japan, which is known for its diverse ecosystem that provides great opportunities for marine science research. Additionally, the close proximity of the main campus, only 15 min drive away, allows researchers to conduct high level analysis after sample collection at the station. Natural and sand filtered sea water from 200 m offshore and 20 m depth, as well as aeration are supplied throughout the animal holding space. A variety of local species, anemone fish, groupers, cuttle fish, squid, octopuses, corals and giant clams are accommodated. We also provide services for sea water delivery to the main campus, field work assistance, and research consultation.

In 2025, a new building will be opened, namely OIST sea-neXus, which is intended to promote collaboration among academia, industry, and governments to enhance the research excellence, innovation, and local-to global contribution. With this new facility, we are aiming to maximize the research potential for marine science by creating regional and international connections at Okinawa.

Poster -4

Japanese Association for Marine Biology (JAMBIO): a scientific community from "on-site" fronts covering Japanese marine coast

Kazuo Inaba

Shimoda Marine Research Center, University of Tsukuba, Shimoda, Shizuoka 415-0025, Japan

The Japanese Association for Marine Biology (JAMBIO) was originally established in 2009 as a collaborative network between the University of Tsukuba and The University of Tokyo. After the contract between these universities expired in 2016, the JAMBIO steering committee, together with a working group focused on restructuring, engaged in discussions about the organization and mission of JAMBIO for its next phase. As a result, JAMBIO was renewed in 2018, evolving into a more extensive, nationwide network that now includes marine stations dedicated to both basic and fisheries sciences.

JAMBIO's mission is to foster and accelerate interdisciplinary research collaborations across Japan by connecting diverse researcher communities. It strives to lead the development of new, cross-disciplinary research areas and serves as a hub for international collaboration in these emerging fields. This includes strengthening research partnerships and international networks within marine biology, positioning JAMBIO as a central entity for advancing collaborative efforts and knowledge exchange in this crucial scientific domain.

JAMBIO collaborates with regional marine networks, including Tara Oceans and the Network Infrastructure for Monitoring eDNA (ANEMONE). It also organizes the *Coastal Organism Joint Surveys: Unveiling Hidden Biodiversity in Japanese Waters* project and manages the RINKAI (Regionally Integrated Marine Database), sharing data with BISMaL and OBIS. JAMBIO regularly publishes the *JAMBIO Newsletter* and hosts forums and international conferences. As of November 2024, JAMBIO has 23 member marine stations. During its initial phase, JAMBIO maintained international associations, particularly with the World Association of Marine Stations (WAMS).

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Poster -5

Aniva Marine Biological Station:

Advancing Ecological Research in Sakhalin's Unique Biomes

Ilya Gordeev[1,2], Aleksandr Semenov[3]

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The Aniva Marine Biological Station, strategically located on Sakhalin Island on the east coast of the Crillion Peninsula, provides an exceptional opportunity to study the rich biodiversity of the Far Eastern seas. This unique research hub, situated between different climatic zones and isolated from industrial impacts, facilitates studies of both marine and terrestrial ecosystems in pristine environments. The station's facilities, including a temporary camp, laboratories, a small fleet of research vessels, and advanced optical equipment, allow scientists to conduct extensive studies of the island's native flora and fauna. The region's terrestrial habitats feature unique biomes, such as dense coniferous forests interspersed with Kuril bamboo, as well as endemic and endangered species - many of which are listed in the Red Books of Sakhalin and Russia. The station's proximity to the ecologically rich "Makarov cold water spot" further enhances research opportunities, as this area supports high levels of productivity and biodiversity, making it ideal for marine studies.

In addition to terrestrial research, the Aniva Station provides exceptional opportunities to study the hydrology and aquatic biodiversity of local rivers and streams, which serve as important spawning grounds for salmonid species, including the endangered Sakhalin taimen. These dynamic freshwater ecosystems offer a natural laboratory for investigating fish population dynamics, flood overflow phenomena, and the effects of typhoons and other climatic events on riverine habitats. With vast marine ecosystems that have remained understudied due to past infrastructure limitations, the station is poised to become a regional leader in marine biodiversity research. Beginning in 2026, Aniva Marine Biological Station will open its doors to researchers from around the world, fostering international collaboration to fill critical knowledge gaps, contribute to conservation, and advance scientific understanding of these remarkable ecosystems.

Poster -6

Northwest Florida NaGISA Program: A Thriving Example of Community Collaboration and Student Leadership - Establishing a Framework for Future Program Enhancement

Jocelyn Wheeler, Noah Stickler, Richard Hernandez

Niceville Senior High School (NHS), Niceville, 32578 Fl;

The NaGISA research program studies the marine biodiversity of inshore areas. The Northwest Florida (NWF) branch of the program operates out of Niceville High School and worked as an ambassador project for the Census of Marine Life (CoML). The NaGISA program was originally established by Dr. Yoshihisa Shirayama of Kyoto University's Seto Marine Research Laboratory in Japan and was brought to Niceville High School in 2003. The NaGISA research program is entirely student operated. Each year over 100 Niceville High School Gifted Students participate in a fall and spring NaGISA beach and/or dive collection and analysis. Students collect data from the beach and 1, 5, 10, 15, and 20-meter depths from offshore sites. Niceville High School students have established a unique Sandy Beach Protocol which modified one of the two original collection protocols established by Dr. Shirayama in Japan. Additionally, the Northwest Florida branch of NaGISA further developed the research program by establishing new specialties allowing for further analysis of collected data. These specialty operations include water quality analysis and monitoring, specimen preservation, specimen photography, DNA barcoding, and the NOAA style Autonomous Reef Monitoring Structure (ARMS) units.

This poster will go in depth on the requirements of the NWF NaGISA program and will establish a baseline model which can be replicated by other schools around the world. The poster will also demonstrate the importance of experiences gained by participating students. While students run the NWF NaGISA program, community involvement makes the success of the program possible. Emerald Coast Scuba partners with the dive team and is one example of community involvement and support throughout the program. The poster will go in depth on the importance of community involvement and support of the NWF NaGISA research program and demonstrates the necessity of community support when establishing new branches of NaGISA.

Poster -7

Monitoring the Coastal Biodiversity Modulation along the Sandy Beaches of the Northwest Florida Gulf Coast

Hannah Castor, Sasha McCraine, Richard Hernandez

NaGISA Marine Research, Niceville High School, Niceville, FL USA

NaGISA is a marine biodiversity research program operating out of Niceville High School with over 100 high school students conducting biannual surveys. Two types of collections — beach and dive — offer comprehensive data on the biodiversity of Florida's Emerald Coast from the high intertidal zone to a depth of 20 meters. By using a simple filtration method for sand samples, a "snapshot" of biodiversity in a particular location can be captured. In addition to the program's Sandy Beach Protocol, NaGISA also includes multiple other components: Autonomous Reef Monitoring Structure (ARMS) units, DNA Barcoding, Microplastics, Water Quality Analysis, Specimen Photography, and Specimen Preservation. The program has been conducting surveys from 2004 to present day and has observed the area's marine biodiversity fluctuate greatly. The slight decrease in marine diversity can be attributed to Florida's many hurricanes, habitat degradation, pollution, and climate change. NaGISA's database has some gaps due to harsh weather conditions and the Covid-19 Pandemic, causing limitations in our study.

Poster -8

ECIMAT Marine Station, a facility for Genomic Monitoring in Marine Biodiversity: Insights from ARMS

Estefania Paredes[1,2], Jose Gonzalez[2], and Jesus Troncoso[1,2]

[1] Department of Ecology and Animal Biology, Marine Sciences Faculty, ECOCOST Lab; [2] Marine Research Centre (CIM-UVIGO) – ECIMAT - University of Vigo, Spain

The Autonomous Reef Monitoring Structures (ARMS) have become an integral part of the Marine Biodiversity Observation Network (MBON) to assess the status and changes in benthic fauna using genomic approaches, particularly DNA metabarcoding, alongside image-based identifications facilitated by the Ocean Sampling Day initiative. Currently, the network comprises around 20 observatories distributed across European coastal waters and Polar Regions, with 134 ARMS deployed and sampled annually.

Since 2021, the European Marine Omics Biodiversity Observation Network (EMO BON), a project under the European Marine Biological Resource Centre (EMBRC), has expanded biodiversity monitoring efforts. In addition to ARMS sampling hard substrates, EMO BON now includes sampling of soft substrates and water columns. At the ECIMAT marine station that belongs to the CIM-University of Vigo, we have been actively participating in ARMS data recovery since the Ocean Sampling Day initiative started and continue to contribute to the EMO BON project.

Samples collected at observatories follow standardized procedures, with two replicates for immediate processing and two stored in a biobank for future research. These samples are sent to EMBRC headquarters in Paris for centralized DNA extraction and sequencing. Processed data undergo quality control and are published in open-access format, following FAIR (Findable, Accessible, Interoperable, and Reusable) principles. ARMS data from 2018 to 2021 have already been published in the European Nucleotide Archive (ENA), representing the largest long-term marine genetic dataset to date, with more data currently in the pipeline for release.

This work emphasized the importance of the marine stations within EMBRC on coordinating, obtaining and processing this large effort on marine biodiversity monitoring.

Poster -9

Environmental DNA Monitoring of Japanese Coastal Waters through Cooperation Among Marine Stations

Masa-aki Yoshida[1], Masakazu Hori[2], Hisashi Yamakawa[3], Reiji Masuda[4], Satoshi Nagai[5], and Michio Kondoh[6,7]

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ANEMONE (All Nippon eDNA Monitoring Network) is an environmental DNA (eDNA) monitoring project with more than 70 fixed-point observation sites throughout Japan. The nation-wide eDNA sampling has been conducted since 2019 to observe the biota of the Japanese coast and its changes, with a focus on fish fauna. We have continued the Biodiversity Big Data Project, which observes biota and their changes along Japan's coasts with a focus on fish fauna. The Japanese Association for Marine Biology (JAMBIO) has cooperated with the ANEMONE to conduct eDNA monitoring covering all of Japan.

The eDNA analysis is a novel technique that enables comprehensive surveys of biota in the environment by detecting DNA fragments in water, which generally reflect the distribution of organisms in the three hours immediately preceding the survey. Using the MiFish primers (Miya et al. 2015), fish species in Japan can be detected and identified mostly at the species level, and their habitat conditions can be monitored. This project is unique to Japan, where there are many small-scale research institutes such as fisheries experimental stations and marine biological stations.

The marine environment along the coast of Japan has changed significantly since the start of this study, with high water temperatures having a substantial impact on the distribution of organisms. The monitoring of fish species, including many species important to fisheries, has become a key economic issue, such as sustainable operation and development of the fishing industry. We believe that this monitoring project will become an essential biodiversity monitoring for the various stakeholders involved. This presentation will provide an overview of environmental DNA monitoring, a representative sample of the scientific data that will be collected, and an overview of the results that can be obtained from this national research.

Poster -10

Coastal Socio-Ecological System Dynamics in Response to the 2011 Tohoku Earthquake and Subsequent Tsunami

Toyonobu Fujii[1,2]

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A catastrophic earthquake and subsequent tsunami hit the Pacific coast of northern Japan on 11 March 2011, devastating many of the towns, villages and coastal ecosystems located along the shore. To measure the extent of damage caused by the disaster and monitor the change in the state of the marine ecosystem, we started conducting a long-term and systematic survey to investigate spatio-temporal dynamics of various marine community structures in relation to changes in a range of physical, biological and anthropogenic variables between 2012 and 2020 in Onagawa Bay in Miyagi Prefecture.

Temporal dynamics of both phytoplankton and zooplankton communities, who occupied the pelagic zone, clearly demonstrated significant seasonal variation along with changes in large-scale environmental conditions such as temperature and nutrient concentrations. However, the observed post-disaster changes in benthic macrofaunal communities, who occupied benthic zone, showed significant relationships with anthropogenic components such as decline in human population, reduction in fishing pressure and the recovery of aquaculture operations.

The pelagic and benthic components of Onagawa Bay appeared to have responded to the 2011 disaster very differently, and this study suggests the post-disaster recovery and dynamics of the coastal ecosystems may be regulated by how human societies respond to the impacts of the catastrophe through their influences on benthic habitat, rather than by the immediate physical force of the earthquake and the subsequent tsunami.

Poster -11

Comprehensive Identification and Analysis of Genetic Polymorphisms Regulating Self/Nonself-Recognition in Fertilization

Kana Hanazaki[1*], Yuma Kondo[2*], Ai Hirano[2], and Takako Saito[2]

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Shizuoka University, Shizuoka 422-8017, Japan; [2]Department of Applied Life Sciences, Faculty of Agriculture, Shizuoka University, Shizuoka 422-8017, Japan; * Equal contribution

The marine invertebrate *Ciona intestinalis* is a hermaphroditic organism which employs self-incompatibility mechanisms to prevent the fusion of its own egg and sperm, thereby maintaining genetic diversity. Three self/nonself-recognition genes of egg, *v-Themis-A/B/B2*, and sperm, *s-Themis-A/B/B2*, have been identified, which possess polymorphic regions with sequence variations among individuals. Genetic analysis showed that identical alleles of *s/v-Themis*-A, -B, and -B2 are recognized as self, preventing self-fertilization. Although multiple *Themis* alleles have been identified, a comprehensive analysis of alleles has not yet been performed. In this study, we focused on s/v-Themis-A and investigated unidentified alleles, their frequencies, and geographical differences in populations of *Ciona intestinalis* from various areas in Japan. Additionally, by analyzing the allele nucleotide sequences, we aimed to elucidate the evolution of alleles within the species and understand the mechanisms of self-incompatibility.

We designed primers to amplify polymorphic regions and performed PCR using genomic DNA as a template. The nucleotide sequences of the PCR products were determined by Sanger sequencing. As a result, we successfully identified several novel alleles. Furthermore, a bias in allele frequencies was observed across different areas, and area-specific alleles were also identified. By analyzing the sequence data, we found that the lengths of exons and introns differ across the alleles.

Increasing the number of samples and expanding study areas investigated will help us discover more novel alleles and better understand allele frequencies. Therefore, collaboration with marine research stations is essential for conducting field investigations required for this study.

Poster -12

Isolation and Structure Determination of a New Antibacterial Lanthipeptide Derived from the Marine-Derived Bacterium *Lysinibacillus* sp. CTST325

Chanaphat Thetsana[1], Ryota Moriuchi[2], and Shinya Kodani[1,3]

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Marine environments are emerging as valuable sources of microorganisms. Marine microorganisms are crucial resources of bioactive compounds. Due to the variable and extreme conditions of marine environments, these microorganisms exhibit greater phylogenetic diversity than their terrestrial counterparts. Therefore, marine microorganisms are an attractive bioresource for new bioactive compounds. [1,2]

In this study, totally 157 bacterial isolates from sediments of Ohya sea coast, Shizuoka, Japan, were screened for an antibacterial activity against *Micrococcus luteus*. Among these isolates, a new bacterium, *Lysinibacillus* sp. CTST325, was identified as a producer of a new antibacterial compound named lysinibacin. Genome sequence analysis of *Lysinibacillus* sp. CTST325 revealed the presence of several biosynthetic gene clusters (BGCs) for secondary metabolites, including a new class III lanthipeptide BGC. Further structural determination of lysinibacin using collision-induced dissociation mass spectrometry (CID-MS) and nuclear magnetic resonance (NMR) analysis determined its molecular formula and chemical structure.

As a result, lysinibacin was identified as a new class III lanthipeptide, containing *N,N*-dimethylated-tyrosine at the N-terminus and the unusual amino acid labionin at the C-terminus. Minimum inhibitory concentration (MIC) assays of lysinibacin confirmed its antibacterial activities against Gram-positive bacteria, including *Staphylococcus aureus*, *Micrococcus luteus*, and *Bacillus subtilis*, with a MIC of 16 μg/mL.

This discovery underscores that the marine environment is a crucial resource for discovering antimicrobial compounds. Therefore, studies focused on finding antimicrobial compounds from marine-derived bacteria may lead to the discovery of new antimicrobial agents in the future.

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Poster -13

Characteristics of microplastics in different matrices in Jiaozhou Bay, China

Shan Zheng, Xiaoxia Sun and Kangning Zhang

Jiaozhou Bay Marine Ecosystem Research Station, Institute of Oceanology, Chinese Academy of Sciences, 7 Nanhai Road, Qingdao, 266071, China

Under the multiple stressors of global climate change and extensive human activities, costal ecosystems are under major threats. Degradation of marine ecosystems will lead to pronounced impacts on their functions. The sustainable development of coastal areas faces serious challenges. Microplastic contamination is a growing threat to marine environment and biota, and represent a great risk for marine ecosystems, society and human health. To help design effective plastic reduction and mitigation strategies, cognition of distribution and characteristics of plastic pollution in multiple matrices are required. We took Jiaozhou Bay as a typical area in coast of China, revealed distribution and characteristics of microplastics in multiple matrices, and the emission characteristics of microplastic sources. An index MCI (microplastic complexity index) was used that is to reflect the contrast of microplastics complexity in different matrices. It can be used for quantitative analysis of microplastic traceability process. and provides new ideas for source apportionment and ecological assessment of microplastics. Quantitative source apportionment is continuing to further promote the accomplishment of goal 14.1 in SDGs and decision support.

Keywords: microplastics, distribution, characteristics, different matrix

Poster -14

Benthic ecosystem may control jellyfish bloom

Song Sun

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Jellyfish bloom causes serious ecological disasters, it occurs in the sea water as plankton, but the key process leading to jellyfish outbreak may occur in the sea bottom and controlled by benthic ecosystem. Jellyfish can cause ecological disasters in the coastal water, such as moon jellyfish, Aurelia app. and Rhopilema esculentum, they belong to scyphozoan medusa. This kind of jellyfish has a complex life history. Most of their life history lives on the sea floor as benthos in the form of polypus, and only a few months in the water body in the form of medusa as plankton. It has a typical phenomenon of alternation of generations. Many studies have been carried out on jellyfish outbreak mechanism and prevention and control strategy, but most of them focus on medusa stage. So far, we can't predict the jellyfish blooms cross year, that is, we can't predict the number of medusas in the water body in spring and summer of the next year according to the marine environment in autumn, winter of the previous year and early spring, especially the change of sea water temperature. One of the fundamental reasons is that we know little about its polyp stage in the seabed. Our research analyses the relationship between the reproductive strategy of polypus and the sea bottom environment through the simulation experiment and field investigation of the characteristics of the sea bottom environment and the impact of environmental changes on the survival, growth, development, and reproduction of polyp in the coastal area and try to reach the goal of cross year prediction through the observation of the benthic ecosystem.

Keywords: Benthic ecosystem; Marine ecological disasters; Jellyfish bloom

Poster -15

Long-term changes and ocean health assessment at a typical coastal ecosystem of Jiaozhou Bay, China

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This study analyzed the long-term changes of Jiaozhou Bay marine ecosystem in the past several decades driven by the global changes. Air temperature in the region of Jiaozhou Bay showed an increasing trend, especially in winter. We also found that the increment per 20 years is approximately one time for the number of heat waves. The concentrations of nutrients such as NO_3-N, NO_2-N, PO_4-P, SiO_3-Si were all increase. The N/P ratio increased before 2001 but decrease after that. A reverse trend was observed on the change of Si/N and Si/P ratio. The abundance and composition of planktonic community changed. Both the abundance and biomass of phytoplankton and zooplankton were increased, especially after 2000. Dominant species have considerably alternated. Some species have been replaced, while some eutrophic species and warm water species increased abundantly. For the zooplankton community, the species number and abundance of medusa increased evidently in recent years. The biodiversity of phytoplankton and zooplankton increased slightly. The total biomass of benthic organisms increased, which was mainly due to the increase of mollusk biomass. The densities of polychaeta, mollusk and crustacea were all increased but the density of Echinodermata decreased during 1981-2007. The diversity of benthic community showed a trend of increase before 2001 but declined slightly after 2001. Since 2003, the ecosystem health of Jiaozhou Bay has been continuously improving, with the highest score in 2021 during the past two decades. Compared with the water quality environment, the biological environment fluctuates in the moderate level. The concurrent impact of climate change and anthropogenic activities had led to changes on the structure and function of the Jiaozhou Bay ecosystem. The present study provided a scientific basis for the protection of marine ecosystem management by translating monitoring, observation, and research results into information that can be understood easily by policymakers.

Abstracts

Oral Presentations on November 29th

Session 4: Marine stations and global policy -1

Plenary Lecture

09:00 – 09:20

Deep-sea Marine Protected Areas and Biodiversity Monitoring

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Modern humanity is required to have a scientific understanding of marine biodiversity and to consider its conservation and utilization. International targets and rules, such as the Aichi Targets and the Kunming-Montreal Global Biodiversity Framework (GBF) of the Convention on Biological (CBD), the SDGs 14, and the Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ), have been established to promote this goal. The Aichi Targets and SDG14 set a goal stating 'By 2020, at least 10 % of coastal and marine areas should be protected, consistent with national and international law and based on the best available scientific information'. Japan then designated marine protected areas (MPA) on the deep-sea floor in addition to coastal areas, with 13.3% of the inner part of the Japanese exclusive economic zone (EEZ) designated as conservation areas.

To designate MPAs, baseline data to determine Ecologically or Biologically Significant marine Areas (EBSAs) must be collected in advance. Due to marine ecosystems fluctuating, even after a MPA is designated, the suitability of biodiversity must be scientifically monitored even after a MPA is designated. In 2022, the CBD established the GBF, which included the goal of conserving 30% of the ocean by 2030 (30by30). To achieve this goal, many countries and regions, including Japan, will likely expand their conservation areas to the deep-sea floor.

Scientific deep-sea biodiversity information is essential to support these efforts. However, opportunities for deep-sea research are limited due to the high cost, large platforms, and manpower required. This talk will introduce low-cost, efficient biodiversity survey methodology for deep-sea data management.

Session 4: Marine stations and global policy -2

09:20 – 09:35

International collaboration in support of the global ocean agenda: The World Association of Marine Stations (WAMS)

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The Ocean is increasingly impacted by multiple pressures at a range of scales from local to global. There is also an increasing recognition of the role the ocean plays in mitigating impacts from pressures such as climate change. There are governance and policy challenges in managing activities from the coast to the open ocean and the need for science and technology to meet these challenges.

In response to these governance and policy challenges there is a growing body of ocean-related international law including the Kunming-Montreal Global Biodiversity Framework (GBF) of the Convention on Biological Diversity (CBD), the United Nations Framework Convention on Climate Change (UNFCCC) which now recognises the crucial role of the ocean and its ecosystems in both the Convention and the Paris Agreement, and most recently the BBNJ agreement ('High-Seas Treaty), which it is hoped will soon be ratified.

In response to the need for science-informed action the United Nations Decade of Ocean Science for Sustainable Development (2021-2030) aims to "reverse the cycle of decline in ocean health" and contribute to the implementation of the Sustainable Development Goals, particularly SDG 14 (Life Below Water). The overall aim is to provide the 'science we need for the ocean we want'.

There is therefore an urgent need to mobilise capacity in support of science-based policy and action. The world's marine stations represent a vast global resource that can be utilised to meet these challenges, breaking down barriers to cooperation and collaboration and creating an opportunity to inform policy on a global scale.

Session 4: Marine stations and global policy -3

09:35 – 09:50

WAMS Fair Ocean Journal: Operationalizing FAIR and CARE Data Principles in coastal communities worldwide

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Marine Stations advance our understanding of the physical, biogeochemical, ecological, social, and economic interactions that constitute coastal places. Yet, despite sophisticated global 'open science' cyberinfrastructure and progress toward a Digital Twin Ocean, many local communities still feel disconnected from scientific information and its benefits. Scientific metadata describing samples/data from marine stations, as well as the legal and social metadata that are vital for their fair (re)use, are too often stripped or lost as value is added in downstream applications. A self-publishing platform (iPlaces) is proposed to address this "contextual collapse". Taking advantage of the project application procedures that many stations already have, WAMS members can use the platform to publish project descriptions and related documentation in their own, station-branded, WAMS journal. Using the familiar peer-review process, station directors act as editors in a collaborative ecosystem that leverages open scientific data services (exploiting FAIR data principles), while empowering local and Indigenous communities to enter a dialogue with research teams (operationalizing CARE data principles). Benefits flow up and down value chains as: (1) place-based metadata are systematically layered onto research projects, (2) global open science infrastructure (e.g., DataCite, ORCID, ROR, Local Contexts, iSamples, GEOME) automatically applies these metadata to downstream research outputs, and (3) iPlaces "data trust" services link these outputs back to the station and its local community. With a Fair Ocean Journal and Data Trust, WAMS could help make the contributions of its member stations more visible, ethical, locally connected, and globally networked.

Session 4: Marine stations and global policy -4

09:50 – 10:05

JAMBIO Coastal Organisms Joint Surveys: A network of marine stations and researchers exploring the Japanese coastal biota

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JAMBIO has organized JAMBIO Coastal Organisms Joint Surveys as one of its central strategic projects since 2014. The scientific aim of the Survey is to uncover the marine fauna of the coastal areas around Japan, with special focus on benthic animals about several cm long. Each survey is hosted by a marine station in Japan, and participants gather at the station for several days to collect and study the local animals. Collections using dredges and epibenthic sleds are commonly employed, but plankton nets, free-diving, scuba diving, snorkeling, and rocky shore collections have also been performed. By assembling researchers who specialize in various taxonomic groups for each survey, the Survey aims to collect and identify as many different species as possible, as well as to promote interactions and research collaborations in the field of marine biology.

25 surveys have been performed so far, with 466 participants from 41 institutes. The participants include not only researchers, staff, and students affiliated with universities, but also those belonging to museums, aquaria, and research institutions. Information of the surveys are summarized in the JAMBIO webpage. The Survey has and will continue to contribute to many scientific projects, and a list of scientific publications that describe the samples collected during the surveys can be found in the webpage. Many of the publications describe new species or report the discovery of species that had not been reported in Japan, while others are in the field of molecular phylogeny, embryology, behavior, evolution, methods development, and paleobiology. Data on animals obtained by the surveys are publicly available through the RINKAI database. To reach a larger potential user group, data in RINKAI is shared with other databases, such as BISMaL, OBIS, and GBIF. There have also been two special exhibitions describing JAMBIO and JAMBIO Coastal Organisms Joint Surveys, with animals collected during the surveys put on display.

Session 4: Marine stations and global policy -5

10:05 – 10:20

Taking the Pulse of the Global Ocean: An Overview of the Partnership for Observation of the Global Ocean (POGO)

Mees, J.[1], Arias Isaza, F.A.[2], Seeyave, S.[3], Beckman, F.A.[3], Krug, L.A.[4]

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The ocean produces half of the world's oxygen, most of its fresh water and much of its food. It regulates climate and weather; is critical to the cycling of heat, water and carbon; and is the source of huge biodiversity. However, far too little is known about the state and functioning of the ocean. Motivated by a common belief that advancing scientific understanding of the ocean is rooted in making systematic, high quality measurements, the Directors of major oceanographic institutions from around the world came together in 1999 and established the Partnership for Observation of the Global Ocean (POGO). POGO has evolved and grown over the past 25 years, but it remains true to its original mission: to expand international support for ocean observing, through innovation of the ocean observing system, capacity development and outreach/advocacy. Today, POGO brings together 56 oceanographic institutes from 32 countries to plan joint actions to advance sustained ocean observations for societal benefit. Over the years, POGO has developed and supported projects on technological innovation; fostered working groups on specific aspects, priorities or challenges related to ocean observing; provided training and capacity development opportunities for over 1,200 early-career scientists in developing countries; created and nurtured an alumni network; highlighted the need for ocean observations to policymakers, the general public and schools, through publications, high-level declarations, public events and citizen science, education and outreach projects. An overview of POGO's objectives, impact and current activities will be provided in this presentation.

Session 4: Marine stations and global policy -6

10:20 – 10:35

Developing an Ocean Science STEM Hub for the West Coast of Scotland

A H Anuschka Miller and Axel E J Miller

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The west coast of Scotland is a tourism hotspot because of its stunning land- and seascapes, wildlife, clans, castles, whisky and seafood. But it is also a deprived and structurally underdeveloped area of the UK, suffering from low income, poor infrastructure, and brain drain. With its wealth in natural resources, there is great potential for social and economic development, but these are dependent on thriving communities underpinned by a skilled workforce. Targeted regional growth funding from UK and Scottish governments is supporting Argyll and Bute - the home of the Scottish Association for Marine Science - is driving a number of projects to increase the appetite for careers in science, technology, engineering and maths (STEM). This includes the development of an Ocean Explorer STEM hub for schools, home educators, community groups and scientific tourists. It will build upon the long-established 'Ocean Explorer Centre': the visitor and outreach centre of SAMS.

This presentation will showcase the structural and operational plans for the centre's development and provide delegates with the opportunity to consider how WAMS might provide a global forum for the promotion and delivery of 'Marine STEM' education and skills training.

Session 4: Marine stations and global policy -7

10:35 – 10:50

The NWF NaGISA Program as a Blueprint for Scientific Outreach

Lillian Suttlemyre, Craig Falzone, Jacob Milz, Julia Milz, Richard Hernandez

Niceville High School, Niceville, Florida, USA

The NaGISA project is a marine biodiversity research program operating out of Niceville High School, involving over 100 gifted high school students in research every fall and spring. Students participate in a beach or dive collection and analysis every fall and spring, with some students also participating in specialty operations such as ARMS units, water quality analysis, Specimen Photography, Specimen Preservation, and DNA Barcoding. The collection protocol, used both on the beach and under the water, involves using cores and quadrats to collect sand and organism samples, and the analysis protocol uses simple filtration and microscopes to isolate, identify, and count organisms. NaGISA is a uniquely structured program, designed to give students marine biology background, teach how to follow specific protocol, and expose them to advanced equipment and procedures through specialties. As well, its position in a high school allows for leadership development in a scientific context through the four years students spend in the program, by implementing peer-to-peer instruction during collections and analyses. Students develop skills highly applicable to future careers in marine science, STEM, and the science career field as a whole.

NaGISA is a highly replicable program, designed to be implemented in a variety of contexts and regions. This project aims to give an overview of what NaGISA has learned and observed in its 20 years of operation, covering both its knowledge of marine biodiversity in Northwest Florida, and its extensive experience in science outreach and how to engage high school students in high level science, as well as fostering leadership skills. This presentation will also discuss how the NWF NaGISA operation has adapted to past challenges, and previously shared its work abroad, and what can be learned from these experiences.

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