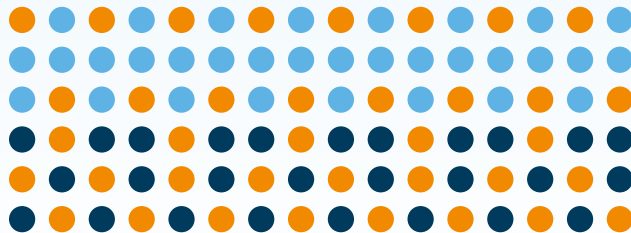


OCEAN OBS'19



AN OCEAN OF OPPORTUNITY

HONOLULU HI
September 16-20
Hawaii Convention Center



Welcome Note 1

Draft Conference Statement 2

Acknowledgements 3

Sponsors 4-5

General Conference Information 6-7

Sli.do Instructions 8

Conference Agenda 9-13

Special Sessions 14-16

Breakout Sessions 17-20

Notes 21

Conference Maps 22-25

Exhibitor List 23



Welcome to



16-20 September
Hawaii Convention Center, Honolulu, HI



AN OCEAN OF OPPORTUNITY

Aloha and welcome to the third installment of this decadal conference series - OceanObs'19!

The conference is a community-driven conference (i.e. YOU) that gathers people from all over the planet together to celebrate progress of ocean observing networks and chart innovative solutions to enhance and integrate global ocean observing in response to society's growing needs for ocean information in the coming decade. Built upon the successes of two previous OceanObs, OceanObs'19 seeks to further mobilize the ocean observing community, ranging from ocean scientists, ocean observers, system engineers, ocean forecasters to a wide range of end-users.

The OceanObs'19 program, **AN OCEAN OF OPPORTUNITY**, aims to determine how we meet future user needs [information]; improve the delivery of products across the globe [interoperability]; advance technology and services [innovation]; and balance needs, capabilities, and knowledge worldwide [integration]. Achieving these outcomes will result in an enhanced, more integrated fit-for-purpose Global Ocean Observing System (GOOS) and will produce many outcomes to improve ocean observing systems over the next decade. Conference sponsors, composed of intergovernmental organizations, funding agencies, research institutions, private companies, and others, will adopt the recommendations and shape the future of ocean observing in parallel with the U.N. Decade of Ocean Science for Sustainable Development (2021-2030).

The agenda includes global representatives who articulate advancements in various aspects of ocean observing. High-level talks and panels will generate ideas for strategic and thematic breakout sessions and network functions during the conference. A key element of the conference will be well-placed and well-attended poster sessions that allow individual observing networks' perspectives, innovations, new information products, and other insights to be shared. There are exciting opportunities for organizations to promote their programs, including the OceanObs'19 showcase, interactive exhibits, and other ocean entertainment, film, and art.

A heartfelt thank you to Honolulu for hosting and to the sponsors, Program Committee, and the conference staff for your time and dedication in making this event a success!

Thank you for your participation. We look forward to an exciting week of celebrating our collective achievements and charting the future of ocean observing!

DRAFT CONFERENCE STATEMENT

Please review the draft OceanObs'19 Conference Statement below.
Comments can be submitted online at: www.OceanObs19.net/statement

We, the participants of the decadal OceanObs'19 Conference, have heard the call from maritime stakeholders, operational resource management agencies, and researchers from private and public organizations about the importance of more complete and sustained observations in the ocean globally. Information about the ocean is needed to design and implement policies that sustain ocean-related human benefits, increase prosperity and well-being, strengthen security and safety at sea, mitigate the risk of coastal and inland disasters including those related to a changing climate, reduce pollution, and conserve life in the sea for the benefit of future generations.

In solidarity, we, the global ocean observing community and users of this information, invite all governments, international organizations, industries, scientists, engineers, stewards of ocean resources, members of civil society, and all of us who live, work and rely on the ocean to engage in a collective effort to evolve ocean observing to generate the data and information we need for the ocean we want. And specifically, to:

- Work toward the design of a fit-for-purpose ocean observing system with engagement of observers, data integrators, information providers, and users from the scientific, public, and private sectors;
- Focus the ocean observing system on addressing critical human needs, scientific understanding of the ocean and the linkages to the climate system, real time ocean information services, and promotion of policies that sustain a healthy, biologically diverse, and resilient ocean ecosystem;
- Harness the creativity of the academic research and engineering communities, work in partnership with the private and public sectors to evolve sensors and platforms, revolutionize information products about the ocean, and reduce costs at each step of the ocean observing value chain;
- Advance the frontiers of ocean observing capabilities into the deep ocean, all aspects of the marine biome, disease vectors, e-DNA, pollutants, and exchanges of energy, chemicals and biology at the boundaries between the ocean and air, land, ice, freshwater, and human populated areas;
- Improve the uptake of ocean data in models for understanding and forecasting of the Earth system;
- Adopt open data policies and improve timely delivery of data directly from observation platforms;
- Use best practices, standards, formats, and vocabularies in the collection and use of ocean data;
- Involve the public through citizen-engaged observations, information products, and outreach;
- Reinforce ocean observing governance structures to share and learn, coordinate, identify priorities, and resolve conflicts; and
- Promote investments in ocean observing and information delivery and sustain support.

Partnerships are at the heart of building and sustaining such an ocean observing system. Partnerships will augment ocean observing capacity, facilitate sharing of infrastructure, promote best practices, and develop innovative technologies. All nations and all stakeholders will benefit by working together on educational programs and developing the human, technological, and governance capacity to measure the ocean.

Indicators based on ocean observations help nations **meet national goals and targets** of the United Nations 2030 Agenda on Sustainable Development, the Paris Climate Agreement, the Sendai Framework for Disaster Risk Reduction, the Convention on Biological Diversity, and the Small Island Developing States Accelerated Modalities of Action Pathway. Ocean observations are fundamental to a successful United Nations Decade of Ocean Science for Sustainable Development (2021-2030) and programs coordinated by Global Ocean Observing System (GOOS) and Group on Earth Observations (GEO).

Realizing all the benefits of ocean observing requires ongoing science, plans, models and forecasts to generate knowledge for society. This knowledge is critical for assessment of climate change and to inform adaptation and mitigation measures. It helps reduce the impacts of extreme events and disasters such as hurricanes and tsunamis. It improves efficiency and sustainability of fishing and supports ecosystem-based management. It guides resource extraction with low environmental impacts and informs policies to reduce pollution and other anthropogenic stressors. This information saves lives, protects property, and creates jobs.

ACKNOWLEDGEMENTS

THANK YOU TO OUR PROGRAM, SPONSORS, AND LOCAL ORGANIZING COMMITTEES

Agnieszka Beszczynska-Möller
Institute of Oceanology, Poland

Fei Chai
Second Institute of Oceanography, China

Sanae Chiba
Japan Agency for Marine-Earth Science and Technology

Minhan Dai
Xiamen University

Valery Detemmerman
Global Ocean Observing System

Albert Fischer
Intergovernmental Oceanographic Commission of UNESCO

Michelle Graco
Instituto del Mar el Perú

Bruce Howe
University of Hawaii

Kim Juniper
Ocean Networks Canada

Amos Kabo-bah
Earth Observation Research and Innovation Centre, Ghana

Sung Yong Kim
Korea Advanced Institute of Science and Technology

Tony Lee
National Aeronautics and Space Administration

Eric Lindstrom
National Aeronautics and Space Administration

Laura Lorenzoni
National Aeronautics and Space Administration

Justin Manley
Just Innovation Inc.

Monica Muelbert
Universidade Federal de São Paulo

Frank Muller-Karger
University of South Florida

Jan Newton
Northwest Association of Networked Ocean Observing Systems

Jim Potemra
University of Hawaii

Moninya Roughan
MetOceanSolutions (Metservice) New Zealand

Christopher Sabine
University of Hawaii

John Siddorn
Met Office, UK

Maria Snoussi
Université Mohamed V Faculté des Sciences

Sabrina Speich
École Normale Supérieure LMD-IPSL

Martin Visbeck
GEOMAR Helmholtz Centre for Ocean Research Kiel

Weidong Yu
National Marine and Forecasting Center, China

WE WOULD LIKE TO THANK THE INTELLECTUAL SPONSORS WHO PROVIDED IN-KIND SUPPORT, PROMOTION, AND SCIENTIFIC INPUT

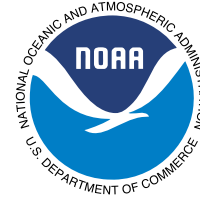
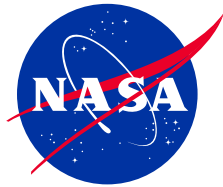
BMKG: Meteorology, Climatology, and Geophysical Agency
Committee on Earth Observation Satellites
Copernicus Marine Environment Monitoring Service
European Global Ocean Observing System
Global Climate Observing System
Group on Earth Observations: Blue Planet
Institute of Electrical and Electronics Engineers
Integrated Marine Observing System
Intergovernmental Oceanographic Commission
Joint Technical Commission for Oceanography and Marine Meteorology

Marine Biodiversity Observation Network
Ocean Conservancy
Oceanology International
Partnership for Observation of the Global Oceans
Scientific Committee on Oceanic Research
World Climate Research Programme
World Ocean Council
Sea Technology Magazine
Environment Coastal & Offshore Magazine
Center for Research on the Changing Earth System
Ocean Tracking Network
North Pacific Marine Science Organization

WE WANT TO ACKNOWLEDGE OUR HARDWORKING STAFF AND VOLUNTEERS



SPONSORS



青岛海洋科学与技术试点国家实验室
Pilot National Laboratory for Marine Science and Technology (Qingdao)

The National Academies of SCIENCES
ENGINEERING
MEDICINE
GULF RESEARCH PROGRAM



SAILDRONE



National Oceanography Centre
NATURAL ENVIRONMENT RESEARCH COUNCIL





国家自然科学基金委员会
National Natural Science Foundation of China



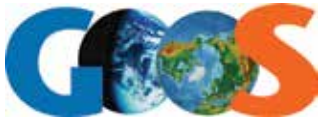
MERCATOR OCEAN INTERNATIONAL



Australian Government



AUSTRALIAN INSTITUTE OF MARINE SCIENCE



Institut de Recherche pour le Développement FRANCE



近海海洋环境科学国家重点实验室 (厦门大学)
State Key Laboratory of Marine Environmental Science (Xiamen University)



海洋科学学院
SCHOOL OF MARINE SCIENCES, SYSU



THE OCEANOGRAPHY SOCIETY



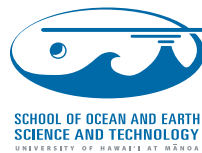
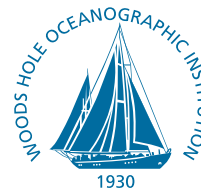
International Science Council



Hydro Group Systems Inc.



KONGSBERG



SCHOOL OF OCEAN AND EARTH SCIENCE AND TECHNOLOGY
UNIVERSITY OF HAWAII AT MANOA



pyro science
sensor technology

GENERAL CONFERENCE INFORMATION

OCEANOBS'19 SPONSORED EVENTS

Welcome Reception and Luau

The Welcome Reception will be held at the Hawaii Convention Center's Rooftop Garden on Monday evening, beginning at 6pm. If you have signed up for this event, you will receive a wristband for entry. Badge and wristband are required for access.

If you signed up for the Luau, you will receive a wristband for this event. *Wristbands and badges must be worn in order to access these events.*

*** Please note that no on-site badge pick up will be available for the Reception after 6pm. There will be no onsite badge pick-up at the Hilton for the Luau, so please make sure that all badges are picked up for your guests prior to the close of registration at 6pm on Thursday, September 19. No person will be admitted without a badge and wristband.*

Early Career Meeting: Sunday, September 15

The Early Career meeting will be held at the **Hilton Hawaiian Village from 12:00pm – 5:00pm on Sunday, September 15.**

The meeting rooms are in the Tapa Building, Tapa I meeting room and the Palace Lounge.

This meeting required advanced sign-up. Your conference badges and event wristbands will be available for pick up at the meeting.

VENUE INFORMATION

Meals

No meals are included in your registration. Coffee and tea will be available throughout the day, beginning at 7:30am. Light snacks will be served at the morning break and at the poster sessions.

Concessions

Food kiosks will be available during lunch hours, from 11:30am – 2:00pm, daily. Additional restaurants may be found at the Ala Moana Mall which is a short walk from the Convention Center.

Mother's Room

If you are in need of a Mother's Room, please stop by the registration desk at the Hawaii Convention Center and inquire.

Medical

If medical attention is needed, there is an on-duty nurse in the Medical room on the 3rd floor during conference hours.

Parking

Parking is available at the Hawaii Convention Center's parking garage for \$10 per entry (no in-and-out).

PRESENTER AND MEDIA INFORMATION

Exhibit Hall

The Exhibit Hall at the Hawaii Convention Center will be available for exhibitor move-in, Sunday, September 15 from 2:00pm until 10:00pm and again on Monday, September 16 from 8:00am until 1:00pm. Move-out will be on Friday, September 20 from 8:00am to 5:00pm. All materials need to be packed up and moved by 5:00pm.

An exhibitor lounge will be available at the back of the hall with refreshments, from 8:00am – 6:00pm daily.

Any questions about the exhibit hall, please contact Heidi Allen at allenh@ucar.edu or she will be on-site daily.

If you need assistance with booth items, internet for your booth or any other booth need, please contact ICS at 808-832-2430 or helpdesk@icshawaii.net.

Posters

Posters should be put up prior to the first Poster Session on Tuesday, September 17 at 4:00pm. Posters will be displayed Tuesday – Thursday.

Poster cards on the poster boards will identify the poster by number. There is space on the poster card for the author's name and dates and times they will be present at their poster(s).

All posters need to be removed by 6:30pm on Thursday, September 19. After this time, posters will be removed and discarded by Convention Center.

Media Guidelines

1. All media will need to register and check-in at the registration kiosks in the Hawaii Convention Center's Lobby.
2. Photography for personal and social media use is permitted throughout event – including sessions, lectures, town halls, plenaries, keynotes, and the exhibit hall – unless the presenter has opted to be excluded.
3. Attendees are expected to honor the preference of any presenter who has indicated "no photography allowed." OceanObs'19 will support and enforce this expectation.
4. The presenter must be identified by name when a photograph of the presenter, presenter's slides, or poster is shared on social media or elsewhere.
5. Attendees should be respectful and considerate of others. Do not use flash, block attendees' view of presenters when capturing photos, or otherwise disrupt presentations.
6. Do not photograph individuals under 18 years of age without explicit verbal or written permission of a parent or guardian.
7. If you have questions or to schedule a private space for interviews, please contact Dawn Mullally at mullally@ucar.edu or in the Media Room at the Hawaii Convention Center, Room 326

PRESENTERS / SPEAKER GUIDELINES

Format for Presentations

PowerPoint (.ppt) or (.pptx); 16:9 Screen Ratio

Apple Users

Individuals using Keynote should bring their files directly to the Speaker Ready Room to have them converted. Adapters will be made available to any presenter that wishes to use their own computer, although it is recommended to use the PC provided in each room.

On-Site Submission of Presentations

All presentations will need to be submitted in Room 326A at the Hawaii Convention Center. This is the Speaker Ready Room. This room will be staffed and run by an audio-visual technician. Presenters may submit their presentations beginning at 12:00pm on Sunday, September 15. Please stop by at least a day before your presentation to submit.

Speaker Ready Room Hours

Sunday, September 15	12:00pm – 5:00pm
Monday, September 16	7:00am – 5:00pm
Tuesday, September 17	7:00am – 5:00pm
Wednesday, September 18	7:00am – 5:00pm
Thursday, September 19	7:00am – 5:00pm
Friday, September 20	7:00am – 11:00am

Advance Submission

It is recommended to submit all presentations on-site. If you have questions or would like to submit a presentation earlier, please email Brian Caracappa at brian@allegiantsource.com.

Reviewing Your Presentation On-site

When submitting your talk in the Speaker Ready Room, please make sure that all fonts, images, and animations appear as expected and that all audio or video clips are working properly. When you are finished submitting, reviewing, and/or making changes to your presentation, you must tell the audiovisual technician you have finalized your presentation file before you leave the Speaker Ready Room. Be sure to bring a backup copy of your presentation with you to the meeting. USB/Flash drives are preferred.

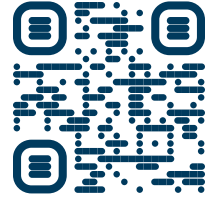
During Your Presentation

Each breakout room will have a lectern, wired lectern microphone, computer audio connection, (1) wireless lavalier microphone, (2) wired audience microphones, projector, screen, windows-based laptop, wireless clicker to advance slides, laser pointer, and hard-wired internet connection.

STAY CONNECTED!

Conference App:

The conference app will be your best connection to get immediate conference updates and schedule changes; create your own conference schedule; browse speaker bios, posters, and more! Scan the QR code OR download using the following steps:



1. Search for the “**Crowd Compass Attendee Hub**” in your phone’s app store, download and install
2. Within the Attendee Hub app, search for **OceanObs’19**
3. Download the OceanObs’19 Conference
4. Log in by following directions
5. Password: ***oceanobs19***
6. Have any questions or issues? Visit our Help Desk by Registration (in front of Kamehameha Exhibit Hall)

Internet and Social Media:



OceanObs19

Password: *Oceanobs19*



@OceanObs19



@OceanObs19_

Audience Participation (Sli.do)

OceanObs’19 is committed to empowering your voice! Since we have such a large audience we are using a simple Q&A and polling tool called Sli.do. This allows you to ask questions (and vote on the ones you like most), contribute to polls, and be a part of the discussion. Sli.do helps us prioritize the discussion topic for conference Q&As, panel discussions, breakout sessions, and the OceanObs’19 outcomes. *See the next page for instructions on how to download and use.*

sli.do



OCEANOBS'19 CODE: #B408

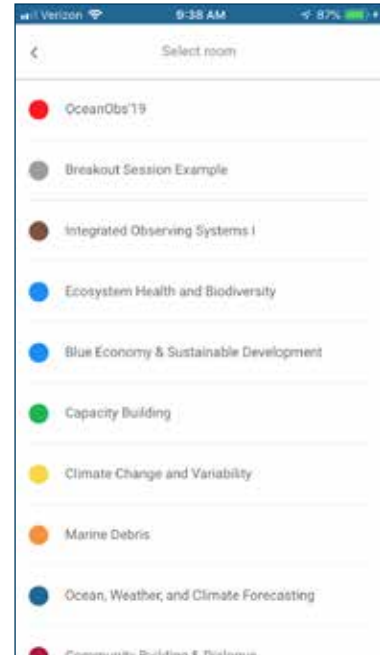
STEP 1: DOWNLOAD APP



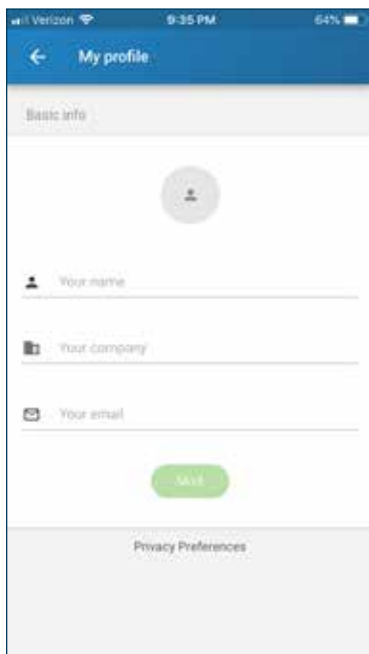
STEP 2: ENTER CODE



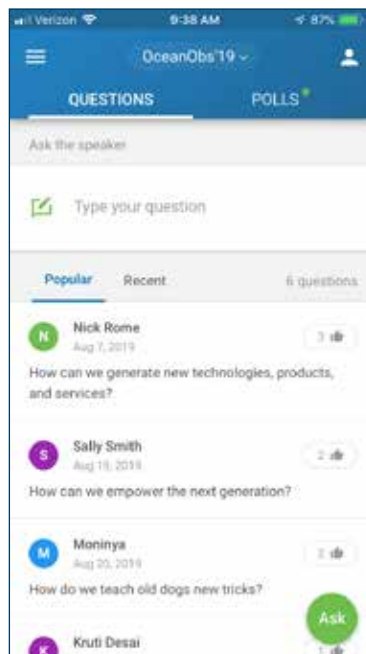
STEP 3: SELECT ROOM



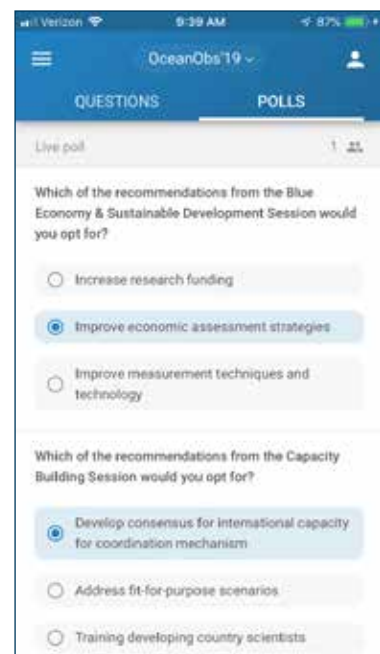
STEP 4: CREATE PROFILE



ASK QUESTIONS



COMPLETE POLLS



CONFERENCE AGENDA

SUNDAY 15 SEPTEMBER: PRE-CONFERENCE

- 1200-1700** **EARLY CAREER EVENT** *Hilton Hawaiian Village*
This four-hour event (RSVP required) will empower the next generation of ocean observing leaders through curated mentorship, expert talks, and social interaction. Happy hour and networking to follow.
- 1200-1700** **PRE-REGISTRATION** *Kamehameha Exhibit Hall*
Badge pickup and on-site registration open at the Hawaii Convention Center.
- 1400-2200** **EXHIBITOR MOVE-IN**

MONDAY 16 SEPTEMBER: PERSPECTIVE

- 0830-0930** **REGISTRATION** *Kamehameha Exhibit Hall*
Attendees should arrive early to acquire name badges and programs and to find their way around.
- 0930-1045** **WELCOME TO OCEANOBS'19!** *Kalakaua Ballroom*
Representatives from the region, the public, and the OceanObs'19 planning group will open the conference and provide an overview of the OceanObs conference series. What are the successes of the conferences? What opportunities exist going forward? How will we realize our goals as a community?
SPEAKERS INCLUDE:
Denise "Dee" Caffari, *The Ocean Race*
Vicky Song, *Clipper Round the World Yacht Race*
Ambassador Peter Thomson, *U.N. Special Envoy for the Ocean (Video)*
Eric Lindstrom, *National Aeronautics and Space Administration*
Martin Visbeck, *GEOMAR Helmholtz Centre for Ocean Research Kiel*
Albert Fischer, *Intergovernmental Oceanographic Commission of UNESCO*
Jan Newton, *Northwest Association of Networked Ocean Observing Systems*
- 1045-1050** **OBSERVATIONS IN ACTION (VIDEO PRESENTATION)**
- 1050-1200** **CONNECTING OCEAN OBSERVATIONS TO THE USER COMMUNITY** *Kalakaua Ballroom*
A series of short presentations will provide an overview of how ocean observing and the information it generates inform society on a wide range of issues. From efforts to build resilience and reduce disaster risk to how near real-time ocean forecasting supports maritime safety and extreme event warnings; ocean observations are integral to keeping people safe on land and at sea. As we look towards creating a more sustainable future, analyzing ocean trends will allow us to document changes due to human interventions, such as climate change, over exploitation, and pollution, and will help us better understand and plan for the impacts of those changes.

Craig McLean, *National Oceanic and Atmospheric Administration (Moderator)*
Bronte Tilbrook, *Commonwealth Scientific and Industrial Research Organisation*
Dwikorita Karnawati, *BMKG Indonesian Meteorology, Climatology, and Geophysical Agency*
Sarah Purkey, *Scripps Institution of Oceanography*
David Millar, *Fugro, IHO General Bathymetric Chart of the Oceans (GEBCO) Project*
Vladimir Ryabinin, *Intergovernmental Oceanographic Commission of UNESCO*
- 1200-1330** **LUNCH**
- 1330-1430** **CONCEPTS SHAPING THE FUTURE OF OCEAN OBSERVING** *Kalakaua Ballroom*
A series of short presentations covering global networks, robotic systems, critical ocean variables, and thematic approaches will provide a glimpse into the many amazing accomplishments in these fields over the last decade. Going forward, the opportunities range from more integrated and comprehensive observing systems to globally shared and interoperable data systems. Presentations will analyze the growth of capacities around ocean observing, data flow, and use, as well as sharing of infrastructures. Presentations will also examine whether this growing, more complex system might benefit from innovation of global, regional, and local governance arrangements.

Introduction Tony Lee, *National Aeronautics and Space Administration*
Citizen Science Folasade Adebeyejo, *EcoHub Initiative*
Argo Toshio Suga, *Tohoku University*
Gliders Emma Heslop, *Global Ocean Observing System & JCOMM OCG*
Deep Ocean Lisa Levin, *Scripps Institution of Oceanography*
Seabed Mapping Larry Mayer, *University of New Hampshire*
Marine Genomics Jesse Ausubel, *The Rockefeller University*
Sea Level Rise Anny Cazenave, *National Centre for Space Studies*
TPOS2020 Weidong Yu, *National Marine Environmental Forecasting Center*

CONFERENCE AGENDA CONTINUED

- 1430-1530 SUCCESSES AND OPPORTUNITIES FOR OCEAN OBSERVING** *Kalakaua Ballroom*
This moderated session will focus on the overarching achievements of ocean observing in the past decade and what they mean for the future. Each talk will address progress and prospects across the OceanObs'19 themes: Information, Integration, Innovation, Interoperability, and Governance.
- (Introduction) Margaret Leinen, *Scripps Institution of Oceanography*
Juliet Hermes, *South African Environmental Observation Network*
Melissa Iwamoto, *Pacific Islands Ocean Observing System*
Jillian Campbell, *U.N.Environment Programme*
Asahiko Taira, *Japan Agency for Marine-Earth Science and Technology*
John Gunn, *University of Tasmania*
- 1530-1600 BREAK**
- 1600-1800 KUPAIANAHA INDIGENOUS EVENT** *Kalakaua Ballroom*
This kupaianaha (wonderful, amazing) event will celebrate how local and indigenous communities can teach the ocean observing community how to set the pace for innovative marine resource management. In addition to remarks from key leaders, it will include a traditional chant, hula, conch blowing and a performance by award-winning local vocalist and Grammy nominee Raiatea Helm and her band.
- 1800-2030 OPENING RECEPTION.** *Rooftop Garden*
Following the special event, conference delegates and RSVP'd guests are invited to congregate on the Convention Center's Rooftop Garden for a reception, sponsored in part by Saildrone, with tropical drinks, beer, wine, food, music, and remarks from the ocean observing community.

TUESDAY 17 SEPTEMBER: INFORMATION

- 0800 EXHIBIT HALL OPENS FOR DAY** *Kamehameha Exhibit Hall*
- 0830-0930 FLOW OF THE CONFERENCE** *Kalakaua Ballroom*
Sabrina Speich, *École Normale Supérieure*
Chris Sabine, *University of Hawaii*
Prince Albert II of Monaco (Video)
- 0930-1100 INFORMATION PLENARY: HOW DO WE MEET FUTURE USER NEEDS?** *Kalakaua Ballroom*
Drawing from the collective knowledge of the Community White Papers, recommendations, and session proposals, this plenary will examine the push and pull of ocean information and define critical aspects of collecting, disseminating, and utilizing it. Our speakers will address user needs as well as shaping collection methods and accessible data products to better serve the entire ocean observing community and society.
- Minhan Dai, *Xiamen University (Session Chair)*
Monica Muelbert, *Universidade Federal de São Paulo (Session Chair)*
Lixin Wu, *Qingdao National Laboratory for Marine Science and Technology*
Pierre-Yves Le Traon, *Mercator Ocean International*
Ana Micaela Martins Sequeira, *University of Western Australia*
Mark Hindell, *University of Tasmania*
- 1100-1130 BREAK**
- 1130-1230 ENABLING THE GLOBAL OCEAN OBSERVING SYSTEM: REALITIES AND OPPORTUNITIES.** *Kalakaua Ballroom*
This panel will investigate the opportunities and challenges of transforming and delivering ocean observing data into practical information. Speakers will draw upon perspectives from around the world and different levels of capabilities in addition to the intergovernmental view of how modern networks of ocean information can enhance science and society over the next decade. Our panelists will converse with the community on their experiences working with ocean observing data and communication systems.
- Laura Lorenzoni, *National Aeronautics and Space Administration (Moderator)*
Susan Wijffels, *Woods Hole Oceanographic Institution*
Mike Fedak, *University of St. Andrews*
Lauren Weatherdon, *U.N.Environment Programme World Conservation Monitoring Centre*
Maria Paz Chidichimo, *National Scientific and Technical Research Council*
- SPECIAL SESSIONS**
Special Sessions are town hall-style events that focus on unique ocean observing topics and offer the opportunity to take a deeper dive into important topics identified as a priority by our sponsors.
- OCEAN OBSERVATIONS AND THE BLUE ECONOMY** *Room 319A/B*
Australian Institute of Marine Science
Commonwealth Scientific and Industrial Research Organisation
- A SUSTAINABLE, FIT-FOR-PURPOSE OCEAN OBSERVING SYSTEM: RESPONDING TO USER NEEDS** *Room 316B*
European Commission
- END USER ENGAGEMENT: A PERSPECTIVE FROM CHINA** *Room 317A*
Chinese Sponsors Group
- DESIGN AND IMPLEMENTATION OF A GLOBAL HARMFUL ALGAL BLOOM OBSERVING SYSTEM** *Room 323C*
Scripps Institution of Oceanography
- AN OCEAN OF DATA: NOAA'S ROLES IN MARINE EXTREME EVENTS AND HAZARDS** *Room 323A/B*
National Oceanic and Atmospheric Administration
- 1230-1400 LUNCH**

CONFERENCE AGENDA CONTINUED

1400-1600 BREAKOUT SESSIONS

Breakout Sessions are a core component of the OceanObs'19 conference, designed to provide a focused discussion forum for the community. Topical sessions organized by daily theme will aim to generate feedback on the conference themes and goals, recommendations to improve global ocean observing governance, and a vision for the next decade of ocean information.

- BLUE ECONOMY AND SUSTAINABLE DEVELOPMENT** Room 317A
Claire Jolly, *Organisation for Economic Co-operation and Development*
- CAPACITY BUILDING** Room 318 A
Brian Arbic, *University of Michigan*
- CLIMATE CHANGE AND VARIABILITY** Room 316A
Karina von Schuckmann, *Mercator Ocean International*
- ECOSYSTEM HEALTH AND BIODIVERSITY** Room 316B
Maury Estes, *University of Alabama in Huntsville*
- GLOBAL OBSERVING SYSTEM FOR MARINE DEBRIS** Room 323C
Francios Galgani, *IFREMER*
- INTEGRATED OCEAN OBSERVATIONS I** Kalakaua Ballroom
Jack Barth, *Oregon State University*
- OCEAN, WEATHER, AND CLIMATE FORECASTING** Room 316C
Eric Chassignet, *Florida State University*

1600-1800 OCEANOBS'19 SHOWCASE AND POSTER SESSION Kamehameha Exhibit Hall

The OceanObs'19 showcase is more than a commercial exhibit hall. A mixture of interactive observation exhibits, Ocean of Opportunity poster sessions, Hawaiian happy hours, ocean photobooths, and scientific talks will expand the network of the ocean observing community and display a comprehensive vision of its collective work. Come discover something new through your own observations in the showcase.

WEDNESDAY 18 SEPTEMBER: INNOVATION

0800 EXHIBIT HALL OPENS FOR DAY Kamehameha Exhibit Hall

0830-0930 REPORT OUTS AND AUDIENCE ANALYSIS Kalakaua Ballroom

Session leads from the previous day will report out on their key recommendations. Audience members will have the opportunity to opt-in to recommendations virtually through the conference software.

0930-1100 INNOVATION PLENARY: HOW CAN WE ENABLE NEW TECHNOLOGIES, PRODUCTS, AND SERVICES? Kalakaua Ballroom

Novel innovation is the cornerstone of all societal advancement. This plenary will examine how we spur innovation in observing technologies, products, and user services. Our speakers will discuss new developments and practices that satisfy users' operational information needs, enable visionary new science, and meet interoperability goals.

- Justin Manley, *Just Innovation Inc. (Session Chair)*
- Moninya Roughan, *MetOceanSolutions (Metservice) (Session Chair)*
- Wendy Watson-Wright, *Ocean Frontier Institute*
- Marlon Lewis, *Dalhousie University*
- Jyotika Virmani, *XPRIIZE*

SPECIAL ANNOUNCEMENT: Daniel Simmons, *U.S. Department of Energy*
Neil Jacobs, *National Oceanic and Atmospheric Administration*

1100-1130 BREAK

1130-1230 OCEAN OBSERVING IN THE NEXT DECADE: EMERGING IDEAS Kalakaua Ballroom

This panel will highlight recent and needed innovations in science, technology, and economics that may have a major influence on the direction of ocean observations and a global observing system. Panelists will provide fresh perspectives on the fundamental and imperative changes coming in the next decade of ocean observing.

- Justin Manley, *Just Innovation Inc. (Moderator)*
- Moninya Roughan, *MetOceanSolutions (Metservice) (Moderator)*
- Riley Hathaway, *Young Ocean Explorers*
- Tim Janssen, *SoFar Ocean*
- Roger Hine, *Jupiter Foundation*
- Vicki Ferrini, *Lamont-Doherty Earth Observatory*

SPECIAL SESSIONS

Special Sessions are town hall-style events that focus on unique ocean observing topics and offer the opportunity to take a deeper dive into important topics identified as a priority by our sponsors.

HOW RESEARCH INSTITUTIONS WILL ENABLE INNOVATION FOR THE GLOBAL OCEAN OBSERVING SYSTEM (GOOS) OVER THE NEXT DECADE Room 323A/B

Japan Agency for Marine-Earth Science and Technology

NASA'S OCEANOGRAPHY FROM SPACE Room 319A/B

National Aeronautics and Space Administration

INNOVATION IN OCEAN OBSERVING PLATFORMS AND INFRASTRUCTURE Room 316B

University of Hawaii

POWERING THE BLUE ECONOMY: ENERGY INNOVATION FOR OCEAN OBSERVATIONS Room 317A

U.S. Department of Energy

INCORPORATING ENVIRONMENTAL DNA INTO GLOBAL OCEAN OBSERVING SYSTEMS: OPPORTUNITIES AND CHALLENGES Room 323C

Scripps Institution of Oceanography
Monterey Bay Aquarium Research Institute

1230-1400 LUNCH

CONFERENCE AGENDA CONTINUED

1400-1600 BREAKOUT SESSIONS

Breakout Sessions are a core component of the OceanObs'19 conference, designed to provide a focused discussion forum for the community. Topical sessions organized by daily theme will aim to generate feedback on the conference themes and goals, recommendations to improve global ocean observing governance, and a vision for the next decade of ocean information.

COMMUNITY BUILDING AND DIALOGUE Room 323C
Jonathan White, Consortium for Ocean Leadership

INTEGRATED OCEAN OBSERVATIONS II Room 316A
Eitarou Oka, University of Tokyo

MODELING AND ASSIMILATION INNOVATION Room 323A/B
Andrea Storto, Centre for Maritime Research and Experimentation
Santha Akella, National Aeronautics and Space Administration

OBSERVING TECHNOLOGY INNOVATION: PLATFORMS AND COMMUNICATIONS Room 319A/B
Dana Manalang, University of Washington
Jeff Ellen, Defense Advanced Research Projects Agency

OBSERVING TECHNOLOGY INNOVATION: SENSORS Room 316B
Rosemary Morrow, Center for Topographic studies of the Ocean and Hydrosphere

OPEN SOURCE SOFTWARE REVOLUTION Room 317A
Chelle Gentemann, Earth and Space Research

U.N. DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT Room 316C
Vladimir Ryabinin, Intergovernmental Oceanographic Commission of UNESCO

1600-1800 OCEANOBS'19 SHOWCASE AND POSTER SESSION Kamehameha Exhibit Hall

The OceanObs'19 showcase is more than a commercial exhibit hall. A mixture of interactive observation exhibits, Ocean of Opportunity poster sessions, Hawaiian happy hours, ocean photobooths, and scientific talks will expand the network of the ocean observing community and display a comprehensive vision of its collective work. Come discover something new through your own observations in the showcase.

THURSDAY 19 SEPTEMBER: INTEGRATION

0800 EXHIBIT HALL OPENS FOR DAY Kamehameha Exhibit Hall

0830-0930 REPORT OUTS AND AUDIENCE ANALYSIS Kalakaua Ballroom
Session leads from the previous day will report out on their key recommendations. Audience members will have the opportunity to opt-in to recommendations virtually through the conference software.

0930-1100 INTEGRATION PLENARY: HOW DO WE BALANCE NEEDS, CAPABILITIES, AND KNOWLEDGE WORLDWIDE? Kalakaua Ballroom
Interconnecting and balancing the moving parts of the system, this plenary will inspect the equilibrium in addressing user and operator needs, capabilities, and knowledge worldwide. Our speakers will examine how they share ocean observing information from their sectors among both existing and potential users, as well as how our community can enhance access and benefits between regions and nations by engaging new actors and facilitating a more balanced transfer of information and technology.

Jan Newton, Northwest Association of Networked Ocean Observing Systems (Session Chair)
John Siddorn, Met Office UK (Session Chair)
Tim Moltmann, Integrated Marine Observing System
Claire Jolly, Organisation for Economic Co-operation and Development
Bennet Atsu Foli, University of Ghana
Kitty Simonds, Western Pacific Regional Fishery Management Council

1100-1130 BREAK

1130-1230 CONNECTING HUMANITY WITH OCEAN OBSERVATIONS: INTEROPERABILITY AND GOVERNANCE Kalakaua Ballroom
This panel will identify improvements for the governance of a global ocean observing system, including advocacy, funding, and alignment with best practices, and designate responsibility for product definition, including production and timely delivery at the appropriate scales (global, basin, regional, national) to serve user needs. Our speakers will also examine the mechanisms for improvement at their respective levels of governance.

Katy Hill, World Meteorological Organization (Moderator)
Patricia Miloslavich, University of Tasmania and Universidad Simón Bolívar
Caine Taiapa, Manaaki Te Awanui Charitable Trust
Dick Schaap, Ocean Data Interoperability Platform
Toste Tanhua, GEOMAR Helmholtz Centre for Ocean Research Kiel

SPECIAL SESSIONS

Special Sessions are town hall-style events that focus on unique ocean observing topics and offer the opportunity to take a deeper dive into important topics identified as a priority by our sponsors.

BUILDING AN INTERNATIONAL TRANSPARENT OCEAN COMMUNITY Room 317A
Qingdao National Laboratory for Marine Science and Technology
Commonwealth Scientific and Industrial Research Organisation
Centre for Southern Hemisphere Ocean Research

FOSTERING AN OCEAN-LITERATE GENERATION: AN APPROACH AT THE INTERFACE OF SCIENCE OUTREACH AND COMMUNICATION Room 323A/B
Institut de la Mer de Villefranche, IMEV

OCEAN PARTNERSHIPS FOR SUSTAINED OBSERVING Room 319A/B
Consortium for Ocean Leadership

OBSERVING NEEDS IN THE DEEP OCEAN Room 316B
Scripps Institution of Oceanography
National Oceanic and Atmospheric Administration

INDIGENOUS OCEAN GOVERNANCE Room 323C
Ocean Networks Canada

CONFERENCE AGENDA CONTINUED

1230-1400 LUNCH

1400-1600 BREAKOUT SESSIONS

Breakout Sessions are a core component of the OceanObs'19 conference, designed to provide a focused discussion forum for the community. Topical sessions organized by daily theme will aim to generate feedback on the conference themes and goals, recommendations to improve global ocean observing governance, and a vision for the next decade of ocean information.

ARCTIC OBSERVING Room 316C
Molly McCammon, Alaska Ocean Observing System

DATA INTEGRATION WITH USER PRODUCTS Room 316B
Jessica Hausman, National Aeronautics and Space Administration

GOVERNANCE NEEDS Room 317A
Toste Tanhua, GEOMAR Helmholtz Centre for Ocean Research Kiel

INTEGRATED OCEAN OBSERVATIONS III Room 316A
Patricia Miloslavich, University of Tasmania and Universidad Simón Bolívar

OCEAN BEST PRACTICES Room 319A/B
Jay Pearlman, Institute of Electrical and Electronics Engineers

TRADITIONAL KNOWLEDGE BUILDING Room 318B
Jörn Schmidt, Kiel Marine Science at Kiel University

UNCERTAINTY QUANTIFICATION Room 323C
Aneesh Subramanian, University of Colorado, Boulder

U.N. SUSTAINABLE DEVELOPMENT GOALS Room 323A/B
Paul DiGiacomo, National Oceanic and Atmospheric Administration

1600-1800 OCEANOBS'19 SHOWCASE AND POSTER SESSION Kamehameha Exhibit Hall

The OceanObs'19 showcase is more than a commercial exhibit hall. A mixture of interactive observation exhibits, Ocean of Opportunity poster sessions, Hawaiian happy hours, ocean photobooths, and scientific talks will expand the network of the ocean observing community and display a comprehensive vision of its collective work. Come discover something new through your own observations in the showcase.

1830 LUAU Hilton Hawaiian Village

FRIDAY 20 SEPTEMBER: VISION

0830-0930 REPORT OUTS AND AUDIENCE ANALYSIS Kalakaua Ballroom

Session leads from the previous day will report out on their key recommendations. Audience members will have the opportunity to opt-in to recommendations virtually through the conference software.

0930-1015 FRESH PERSPECTIVES TOWARD OCEANOBS'29 Kalakaua Ballroom

After meeting throughout the conference to collect information and discuss their priorities, groups from the early career ocean observing community will present the perspectives of future users and observers. The panel will report on the content and ideas emerging from OceanObs'19 and their own vision of the next decade and beyond.

Ruth Perry, Shell Exploration and Production (Moderator)
Kerstin Forsberg, Planeta Océano
Michael Vegh, Central Coast Indigenous Resource Alliance
Sheku Sei, Institute of Marine and Antarctic Science
Samuel Wang, Xiamen University
Karina Khazmutdinova, National Academies of Sciences, Engineering, and Medicine
Erin Satterthwaite, National Center for Ecological Analysis and Synthesis & Future Earth
Clarisse Sullivan, University of Hawaii

1015-1045 BREAK

1045-1130 CHARTING THE WAY FORWARD: COMMUNITY VIEWS Kalakaua Ballroom

Members of the Program Committee will articulate the near-term actions to implement the recommendations from the conference and explore opportunities to bring together existing and newly formed groups from the ocean observing community.

Sabrina Speich, École Normale Supérieure (Moderator)
Martin Visbeck, GEOMAR Helmholtz Centre for Ocean Research Kiel
Moninya Roughan, MetOceanSolutions (Metservice)
Justin Manley, Just Innovation Inc.
Jan Newton, Northwest Association of Networked Ocean Observing Systems
Tony Lee, National Aeronautics and Space Administration
Monica Muelbert, Universidade Federal de São Paulo

1130-1215 CHARTING THE WAY FORWARD: SPONSORS' VIEWS Kalakaua Ballroom

Key sponsors will articulate long-term commitments across the major themes of the conference. They will agree to adopting key new principles and recommendations generated at OceanObs'19 to improve the governance of a Global Ocean Observing System; including advocacy, funding, and best practices. The panel will also present steps for aligning the outcomes of OceanObs'19 with the U.N. Decade of Ocean Science for Sustainable Development.

Albert Fischer, Intergovernmental Oceanographic Commission of UNESCO (Moderator)
Minhan Dai, Xiamen University
Margaret Leinen, Scripps Institution of Oceanography
David Legler, National Oceanic and Atmospheric Administration
Andreea Strachinescu, European Commission
John Gunn, University of Tasmania
Tarron Lamont, Department of Environmental Affairs, South Africa

1215-1300 ACKNOWLEDGEMENTS, CONFERENCE STATEMENT, AND PATH TO OCEANOBS'29 Kalakaua Ballroom

SPECIAL SESSIONS

TUESDAY 17 SEPTEMBER **1130-1230**

OCEAN OBSERVATIONS AND THE BLUE ECONOMY (ROOM 319 A/B)

*Australian Institute of Marine Science
Commonwealth Scientific and Industrial Research Organisation*

Nations with marine territories are blessed with unique economic opportunities as oceans enable global trade through shipping, feed and water people through fishing and desalination, and attract tourists and their recreational spending. They have a responsibility for environmental stewardship in order to safely and efficiently extract resources (plant, animal, and mineral) in such a way that limits adverse impacts on the environment and other industries and users. Australia is one such nation and the most recent estimate of Australian marine industries was AU\$68 billion in 2015/16. Observations are critical in managing our oceans and responding to the challenges faced by our oceans resulting from climate change, pollution, acidification etc. Australia marine research providers have long collaborated to provide high value observations to those with a stake in healthy and sustainable oceans. This event will discuss several case studies linking ocean observations to growth of the blue economy followed by a panel discussion.

A SUSTAINABLE, FIT-FOR-PURPOSE OCEAN OBSERVING SYSTEM: RESPONDING TO USER NEEDS (ROOM 316B)

European Commission

To realise a global or a regional fit-for-purpose ocean observing system by 2030 would benefit from consensus as to what fit-for-purpose means, who are the main stakeholders, and how to obtain feedback on the system performance. We will focus on what different users expect, how they can be integrated into putting the system together, how they are involved in design and operation of the system, and how we enhance sustainability of ocean observation systems by 2030. The All-Atlantic Ocean and its connection to the adjacent seas and polar oceans will be taken as an example.

END USER ENGAGEMENT: A PERSPECTIVE FROM CHINA (ROOM 317A)

Chinese Sponsors Group

This special session will address nationally coordinated activities on end user engagement and how they interact with global ocean observations.

DESIGN AND IMPLEMENTATION OF A GLOBAL HARMFUL ALGAL BLOOM OBSERVING SYSTEM (ROOM 323C)

Scripps Institution of Oceanography

This one-hour special session will feature presentations and a roundtable discussion that focus on the design and implementation of a global harmful algal bloom (HAB) observing system integrated with broader conference objectives of observing life in the sea in a changing climate. We will deliver a set of recommendations to the global ocean observing community and the UNESCO SCOR/GlobalHAB program as action items that align with the GOOS framework and respond (but are not limited) to the following objectives: 1) advance and improve cost-effective and sustainable HAB forecast systems that address the HAB-risk warning requirements of key end-users at global and regional levels; 2) incorporate available Earth observations into monitoring and predictive efforts, including blended model-satellite products and data-assimilative model systems; 3) identify societal priorities with respect to the HAB problem, e.g. public health, food security, clean drinking water, aquaculture, sustainable fishing, tourism and recreation, and 4) form programs with robust communication channels for stakeholders and partners.

AN OCEAN OF DATA: NOAA'S ROLES IN MARINE EXTREME EVENTS AND HAZARDS (ROOM 323 A/B)

National Oceanic and Atmospheric Administration

Response to extreme events demands the world's best global weather models and the most robust ocean observation systems. Predicting ecosystem-wide weather and marine extremes and hazards has been enhanced by advances in ocean observations and by building cross-disciplinary partnerships between oceanographers and meteorologists. In this session, NOAA will provide an agency overview to show the integration and interconnected contributions necessary to take observations to services across the value chain, and use shared data and information to save lives in the oceans and along the coasts while sustaining and improving national and local economies. The session will include time for community discussion to help identify gaps and opportunities.

HOW RESEARCH INSTITUTIONS WILL ENABLE INNOVATION FOR THE GLOBAL OCEAN OBSERVING SYSTEM (GOOS) OVER THE NEXT DECADE (ROOM 323 A/B)

Japan Agency for Marine-Earth Science and Technology

While long-term ocean observations are critically important for physical, biological, and chemical research of our seas, sustaining routine observations does not always match immediate priorities of research institutions and agencies, such as JAMSTEC. On the other hand, it is true that innovative observing instruments, techniques, and methodologies stem from sustained observations. Taking the evolution of Argo as an example, this session will address the challenges and opportunities of how research institutions enable innovation through both research and sustained activities and how they contribute to the Global Ocean Observing System (GOOS).

NASA'S OCEANOGRAPHY FROM SPACE (ROOM 319 A/B)

National Aeronautics and Space Administration

The U.S. National Aeronautics and Space Administration (NASA) welcomes OceanObs'19 participants to a dialogue about NASA's ocean observation plans for the 2020's. A panel will share highlights of NASA's on-orbit oceanography missions, upcoming launches – the Surface Water Ocean Topography (SWOT) mission and the Plankton, Aerosol, Cloud, and ocean Ecosystem (PACE) mission, airborne field campaigns – the Oceans Melting Greenland (OMG) project, and the Sub-Mesoscale Ocean Dynamics Experiment (S-MODE) project. If time allows, broader links to NASA's ocean-related science team activities will be discussed. Topics will be presented as “flash” talks by a panel followed by audience questions and discussion with the panelists.

INNOVATION IN OCEAN OBSERVING PLATFORMS AND INFRASTRUCTURE (ROOM 316B)

University of Hawaii

We will explore innovation both in furthering the capability of existing platforms as well as new and possible future platforms and shared infrastructure. Of interest are multi-purpose sustainable infrastructure elements that are networked and interconnected to provide system-wide services such as basin scale positioning and navigation and power and communications. The session will develop recommendations for the continuing development and eventual implementation into GOOS.

POWERING THE BLUE ECONOMY: ENERGY INNOVATION FOR OCEAN OBSERVATIONS (ROOM 317 A)

U.S. Department of Energy

Ocean observations underpin the blue economy, yet most of the ocean remains unexplored and poorly sampled, due in part to lack of sufficient energy to power instruments and platforms. Marine energy from waves, tides, ocean currents, and thermal gradients is plentiful, reliable and, when integrated with ocean observing technologies, could reduce or eliminate many energy constraints. Join representatives from the U.S. Government (including DOE, NOAA, and others) along with international experts from across the ocean observation and marine energy communities to discuss how recently announced research initiatives and energy innovation can lead to entirely new capabilities in ocean observation.

INCORPORATING ENVIRONMENTAL DNA INTO GLOBAL OCEAN OBSERVING SYSTEMS: OPPORTUNITIES AND CHALLENGES (ROOM 323 C)

*Scripps Institution of Oceanography
Monterey Bay Aquarium Research Institute*

The field of environmental DNA (eDNA) is exploding with analysis techniques, autonomous systems, and information management evolving and improving rapidly. This session will provide a brief overview of eDNA measurement and issues, organizational efforts by the international eDNA community, improvements in laboratory and in situ techniques, advances in the use of eDNA for ecosystem assessments, and the challenges remaining. We anticipate developing recommendations to advance international use of eDNA in global ocean observing systems.

BUILDING AN INTERNATIONAL TRANSPARENT OCEAN COMMUNITY (ROOM 317 A)

*Qingdao National Laboratory for Marine Science and Technology
Commonwealth Scientific and Industrial Research Organisation
Centre for Southern Hemisphere Ocean Research*

The special session is hosted by National Laboratory for Marine Science and Technology (QNLN) and co-hosted by Commonwealth Scientific and Industrial Research Organization (CSIRO) and Center for Southern Hemisphere Oceans Research (CSHOR). One of the “societal outcomes” of the U.N. Decade of Ocean Science is “transparent and accessible ocean” through observations, understanding, and modeling, leading to a “predicted ocean,” whereby all nations, stakeholders and citizens have access to ocean data and information, technologies, and have the capacities to inform their decisions. This session focuses on how we may best build a global “transparent ocean” community by entraining contributions from more nations to innovation of observing technologies, building a cost-effective global observing system, and to data-sharing. Another focus of the session is on whether there is need for “between-decadal” conferences in the era of artificial intelligence and deep machine learning, to respond in a timely fashion to scientific and societal needs arising within the U.N. Ocean Decade and beyond.

FOSTERING AN OCEAN-LITERATE GENERATION: AN APPROACH AT THE INTERFACE OF SCIENCE OUTREACH AND COMMUNICATION (ROOM 323 A/B)

Institut de la Mer de Villefranche, IMEV

An ocean-literate person understands the importance of the ocean to humankind, can communicate about the ocean meaningfully, and is able to make informed and responsible decisions regarding the ocean and its resources. Today, with the pressing need and high ambition to increase ocean literacy, science outreach and communication seek to inform citizens – kids and adults – and to share knowledge and values. Together with Frontiers for Young Minds, a panel of marine scientists and outreach experts will present and discuss an original way for science outreach and communication, an ocean Collection for kids and teens, and exchange on its potential for future development.

OCEAN PARTNERSHIPS FOR SUSTAINED OBSERVING (ROOM 319 A/B)

Consortium for Ocean Leadership

Sustained ocean observing requires reliable funding and decision support from myriad partner organizations and end-users. This session will examine next steps for galvanizing these stakeholders into an international collective impact organization to strengthen ocean observing governance over the next decade. Town Hall panelists will engage the audience in a discussion about how we develop formal partnerships to augment networks between the ocean observation science community with nonprofits, philanthropic organizations, academia, government agencies, and the commercial sector. The importance of ocean data for national security, the economy, and society, as well the international coordination required to support a global system, makes governments primarily responsible for supporting ocean observations. However, there is an opportunity for new models of support of a sustained observing system within and beyond government structures. Long-term planning and partnerships with private and nonprofit sectors could address some of the challenges in sustaining observations, which includes support for workforce and technology development. Achieving this will require new cooperation beyond what has been achieved to-date. Up to recently, the many ocean organizations that do exist have tended to operate more on their own than jointly. Led by the organizations that coordinated OceanObs’19, this session will engage speakers and the audience in a discussion about how to improve governance to advance ocean observing, addressing broad issues with many constituencies.

OBSERVING NEEDS IN THE DEEP OCEAN (ROOM 316 B)

Scripps Institution of Oceanography

National Oceanic and Atmospheric Administration

This session, hosted by the Deep-Ocean Observing Strategy and NOAA Office of Ocean Exploration and Research, will foster discussion among a broad group of stakeholders with deep-ocean interests about the integration of observing programs, data, and models, to address scientific and societal needs of the 21st century. We will focus on the challenges of how to (a) innovate and facilitate the integrated collection and analysis of biological, biogeochemical and physical observations, and (b) coordinate and develop capacity for the highly distributed deep-ocean observing and exploration communities in alignment with GOOS. Our goal is to generate new approaches and community-vetted actions for sustained observing within the deep-ocean community and to provide input to the U.N. Decade of Ocean Science as well as other international planning efforts.

INDIGENOUS OCEAN GOVERNANCE (ROOM 323 C)

Ocean Networks Canada

Indigenous nations have been involved in ocean observation for many generations, both through lived experience and through the use of new and emerging methods. However, the use of Indigenous knowledge in ocean observation is not always well understood or engaged by the non-Indigenous community. In this session, delegates from Canada, Hawaii, the Continental U.S., New Zealand, and the Pacific Islands will provide insight on some of the priorities, methods, and values for Indigenous ocean observation today, and for the coming decade, followed by an opportunity for dialogue with the audience. Through this dialogue, this session aims to build relationships to ensure the rights, interests, knowledge, and specific ocean information needs and technical capacities of Indigenous peoples are reflected in the next decade of ocean observation efforts.

BREAKOUT SESSIONS

TUESDAY 17 SEPTEMBER1400-1600

BLUE ECONOMY AND SUSTAINABLE DEVELOPMENT (ROOM 317 A)

Claire Jolly, Organisation for Economic Co-operation and Development

Ocean observations play a key role in supporting the sustainability imperatives surrounding a growing blue economy. As the breadth and volume of institutional and commercial activities linked to the ocean rises, so too does the need for observational capacity to describe, understand and forecast the ocean. Demonstrating the scientific, social, and economic value derived from sustained observations will be essential to making the case for the public and commercial investments needed. Three elements will be addressed during the session: the linkage between ocean observations and sustainable development, with illustrations from different perspectives; socioeconomic value coming from these observations, with lessons learned since the last OceanObs a decade ago (can we better quantify the impacts or is this getting even more complex?); and finally, most importantly the “so what?” question, Is measuring the value from ocean observations making any difference? Many new requirements for sustainable development of the marine environment remain poorly funded. Are socioeconomic studies impacting programmes in positive ways? What can we do to improve impact?

CAPACITY BUILDING (ROOM 318 A)

Brian Arbic, University of Michigan
Alexis Valauri-Orton, The Ocean Foundation

The goal of this session is to make a recommendation to the ocean community on a common strategy that brings together various strands of capacity development for ocean observing, decision making, conservation, and sustainable use across the globe, with an emphasis on SIDS and developing countries. The session will begin with a small number of “lightning talks” on strategies for breaking down barriers to capacity development, and will then turn to participation from the audience to further explore capacity development methods, challenges, and successes. We are keen to have participation from a wide variety of stakeholders, including a healthy mixture of younger and older stakeholders, as well as industry partners, decision makers, conservation and sustainability experts, and ocean scientists.

CLIMATE CHANGE AND VARIABILITY (ROOM 316 A)

Karina von Schuckmann, Mercator Ocean International

Today, the international climate service and policy agenda requires high-quality, scientifically sound, and reliable information requiring sustained observational efforts that feed into gridded products, models, and reanalyses to detect, monitor, understand, and predict climate variations and change. This session aims to refine high-level recommendations for the next decade based on OceanObs'19 Community White Papers focused on ocean related climate indicators such as those developed under GCOS and WCRP, including ocean temperature and heat content, sea level, ocean acidification, air-sea flux, and sea ice extent. The expected outcome of this event is to identify an international roadmap over the next decade to support timely, sustained, and high-quality delivery of ocean Global Climate Indicators with reduced uncertainties and to identify opportunities for regular joint international assessments.

ECOSYSTEM HEALTH AND BIODIVERSITY (ROOM 316 B)

Maury Estes, University of Alabama in Huntsville

The purpose of the session is to refine and endorse a plan to develop and publish a 10-year blueprint for observing marine life in support of ecological forecasting, local to global ocean health assessments, promoting conservation, and sustaining the blue economy. The plan and vision will be developed by community leaders prior to OceanObs'19. The session will generate a recommendation for the global ocean observing community to integrate marine life and biodiversity into ocean observing efforts; the recommendation will outline requirements for multidisciplinary information to address user needs and promote use of best practices to bring together the observing community to accomplish this very major challenge over the next decade.

GLOBAL OBSERVING SYSTEM FOR MARINE DEBRIS (ROOM 323 C)

Francios Galgani, IFREMER

The goal of this session is to advance a harmonized approach to the design of regional/national programs and their integration in a global platform/repository. We will discuss common approaches of data collection and management and propose their unification and harmonization. The session will also propose post-conference activities and programs for the next decade and discuss marine litter observation governance.

BREAKOUT SESSIONS CONTINUED

INTEGRATED OCEAN OBSERVATIONS I: ACROSS GEOGRAPHIC SCALES (KALAKAUA BALLROOM)

Jack Barth, Oregon State University

The goal of this breakout session, constituting a part of the larger thematic block on “Integrated Ocean Observations,” is to develop a set of recommendations on how the global to coastal ocean observing systems can provide information and ocean products that are most useful to society’s needs. Participants will be invited to bring forward their suggestions on, for example, what innovation is needed to enable high-quality and high resolution measurements in the coastal ocean, noting the importance of regional and global processes to the coastal ocean, or on how to make national and regional systems more interoperable based on common standards and best practices. This session will seek to integrate the different observing approaches, knowledge and experiences of coastal ocean observers and users, and put the recommendations in the context of the vision for an integrated global ocean observing system.

OCEAN, WEATHER, AND CLIMATE FORECASTING (ROOM 316 C)

Eric Chassignet, Florida State University

The main goal of this breakout session is to identify post-conference activities and programs that should be carried out over the coming decade to increase synergy between ocean observation initiatives and ocean, weather, and climate forecasting. These activities will guide the actions of OceanPredict, GOOS, WMO, and related communities, focusing on maximizing value from the observing network, improving services to users, and gaining scientific and technical efficiencies by bringing together related science communities. The basis for the discussion will consist of the Community White Papers relevant to Ocean, Weather, and Climate Forecasting, including reanalysis, S2S predictions, and OSE/OSSEs.

WEDNESDAY 18 SEPTEMBER **1400-1600**

COMMUNITY BUILDING AND DIALOGUE (ROOM 323 C)

Jonathan White, Consortium for Ocean Leadership

Communicating the value of sustained ocean observing systems is urgent and necessary for their implementation, continuity and expansion, and relies on effective dialogue among users at all levels to build support from policymakers and the public. Through presentations, small group discussions, and an open forum, this breakout will examine how academia, industry, government, and nongovernmental organizations involved with global ocean observing currently interact with policymakers, stakeholders and the public, and how to improve those pathways in the future. Key discussion foci and projected outcomes will include (1) broader understanding of how existing ocean observing science and policy areas intersect nationally and internationally, (2) identification of opportunities to build global support for ocean observing through cross-sector and international partnerships, and (3) determination of actions that the ocean observing community should take to more effectively communicate and engage with stakeholders, leaders, and the public worldwide.

INTEGRATED OCEAN OBSERVATIONS II: DIVERSE STAKEHOLDERS NEEDS (ROOM 316 A)

Eitarou Oka, University of Tokyo

This breakout session, constituting a part of the larger thematic block on “Integrated Ocean Observations,” focuses on innovations in the Framework of Ocean Observing (FOO) and its implementation in cross-disciplinary ocean observing systems on different geographical scales. After an introductory talk on the FOO processes and three to four talks by different stakeholders introducing their information and observation needs, the speakers will participate in a round-table discussion of how diverse stakeholders can work together to improve and build existing and emerging observing systems under the FOO in the next decade. In the final part, audience polling will be used to make consensus recommendations for integrating ocean observations across scales and disciplines to meet expanding user requirements, with FAIR data and synthesized information.

MODELING AND ASSIMILATION INNOVATION (ROOM 323 A/B)

Andrea Storto, Centre for Maritime Research and Experimentation

Santha Akella, National Aeronautics and Space Administration

This session will focus on ocean reanalyses, beginning with an update from recent assessment and inter-comparison studies, including recent advances and unsolved challenges, developing a vision for sustainable and integrated global ocean observations for climate monitoring and reconstructions, and observational needs for climate products. The discussion will focus on the use of observing system impact studies to improve the optimal deployment of observations and maximize their uptake in climate products and the use of coupled DA to maximize extraction of ocean observational information for improving ocean reanalyses, climate products, and prediction.

BREAKOUT SESSIONS CONTINUED

OBSERVING TECHNOLOGY INNOVATION: PLATFORMS AND COMMUNICATIONS (ROOM 319 A/B)

Dana Manalang, University of Washington

Jeff Ellen, Defense Advanced Research Projects Agency

Technological advancements in ocean observation and communications contribute to the improvement of marine awareness and environmental understanding. This session looks to identify and discuss breakthrough approaches in robotic persistence and scalable platforms and methods of transmitting data for relevant applications. Innovations in this important area can contribute to a better understanding of ocean modeling, marine mammal activity, and weather while reducing cost of capabilities required to obtain this information.

OBSERVING TECHNOLOGY INNOVATION: SENSORS (ROOM 316 B)

Rosemary Morrow, Center for Topographic studies of the Ocean and Hydrosphere

This session will present the new satellite sensors being developed or proposed over the next decade to enhance our global observations of ocean surface parameters, many aiming at finer scale ocean processes. The dynamical processes being observed are diverse and complementary (SST, SSS, SSH, winds and waves, ocean color, marine gravity), and their synergistic use will be discussed. Linking these satellite observations of smaller, rapid processes to the upper ocean vertical structure also requires a new reflection on the required in-situ sampling at these scales.

OPEN SOURCE SOFTWARE REVOLUTION (ROOM 317 A)

Chelle Gentemann, Earth and Space Research

The evolution of open source software coupled with modern computing platforms enables new scalable scientific approaches. This session will explore applications of open source software to science, discuss popular tools and best practices, identify potential barriers to this rapidly advancing form of collaboration, and generate ideas on how open source software can further benefit the scientific community.

U.N. DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT (ROOM 316 C)

Vladimir Ryabinin, Intergovernmental Oceanographic Commission of UNESCO

The U.N. Decade of Ocean Science for Sustainable Development 2021-2030 will be a once-in-a-lifetime opportunity to mainstream ocean science by focusing on existentially important issues of sustainable development, towards “the ocean we need for the future we want”. The upstream element of the entire Decade value chain will be a competent, reliably and durably resourced ocean observing system. The breakout session will review the summary of all planning efforts for the Decade by the time of OceanObs’19 and will try to project it on the potential configuration, existing building blocks, and requirements and incentives for such a competent ocean observing system.

THURSDAY 19 SEPTEMBER **1400-1600**

ARCTIC OBSERVING: BEST PRACTICES FOR DEVELOPING MULTI-SCALE, INTEGRATED ARCTIC OBSERVING SYSTEMS USING STAKEHOLDER ENGAGEMENT AND SOCIETAL BENEFIT AREAS (ROOM 316 C)

Molly McCammon, Alaska Ocean Observing System

Sandy Starkweather, US Arctic Observing Network and Sustaining Arctic Observing Networks

Rapid warming in the Arctic is driving profound environmental and socioeconomic change impacting immediate response tactics and long-term planning and policy strategies. Engaging with stakeholders and identifying societal benefit areas can be used to help design integrated observing systems, identify new technologies, and assess their performance across multiple scales. This session will focus on lessons learned, best practices, and emerging technologies from existing Arctic systems that can be used elsewhere in the Arctic, as well as other regions of the global ocean to ensure that observing systems are meeting identified needs.

DATA INTEGRATION WITH USER PRODUCTS (ROOM 316 B)

Jessica Hausman, National Aeronautics and Space Administration

As technology improves for observing the oceans, the data and outputs need to be accessible and comprehensible to not just the measurement team but also to other researchers, science applications, modelers, and educators. To reach the widest audience and integrate with various systems and services, the data should have a data management plan and be formatted so it can be interoperable by following conventions and standards set forth by climate, meteorological, oceanographic, and other Earth science communities. This session will discuss the above, what is currently available as resources, and what gaps and other special considerations need to be addressed going into the next decade to make data more accessible and usable to a variety of users.

BREAKOUT SESSIONS CONTINUED

GOVERNANCE NEEDS (ROOM 317 A)

Toste Tanhua, GEOMAR Helmholtz Centre for Ocean Research Kiel

With a vision for a fully integrated and responsive ocean observing system, a governance system needs to support the design, implementation, evolution, and maintenance of the system that our ocean, governments, and societal need. The present governance arrangements will not be sufficient to realize this ambition, as they do not connect the different communities, networks, and partners in fully achieving their potential and do not allow for full implementation of the concepts identified in the Framework for Ocean Observing. This breakout session will present outcomes from a series of workshops, followed by a moderated panel discussion with the goal of identifying a roadmap and recommendations for reforming the governance of the ocean observing system.

INTEGRATED OCEAN OBSERVATIONS III: ACROSS DISCIPLINES AND NETWORKS (ROOM 316 A)

Patricia Miloslavich, University of Tasmania and Universidad Simón Bolívar

The goal of this breakout session, constituting the third part of the larger thematic block on “Integrated Ocean Observations,” is to provide recommendations to the ocean community on how to fully integrate biological observations into a truly multidisciplinary observing system, from the coast across open ocean, and from the surface to the deep. The session will present a set of priority goals and milestones for the 2019-2029 decade as well as recommendations for the implementation of a multidisciplinary observing system focused on partnerships, communication, best practices, data quality and access, capacity development, and sustainability. The audience will discuss how each of the goals and milestones may be achieved and reach consensus on priority recommendations for an improved understanding and prediction capacity of life in the ocean.

OCEAN BEST PRACTICES (ROOM 319 A/B)

Jay Pearlman, Institute of Electrical and Electronics Engineers

In this session, all participants may identify priorities in the creation and evolution of best practices across the ocean value chain, with their adoption at local, regional, and global scales. Through discussion with a panel of experts and the session participants, we will develop a strategy and recommendations to ensure the benefits of best practices are accrued across the ocean community, via sustainability, peer review, clearly defined use cases, and the incorporation of the latest technologies. Of particular interest for science and applications are best practice strategies that lead to consistent and transparent observations in support of high-quality science to advance the blue economy, wise conservation of life in the ocean, and sustainable development.

TRADITIONAL KNOWLEDGE BUILDING (ROOM 318 B)

Jörn Schmidt, Kiel Marine Science at Kiel University

The goal of this session is to develop best practice guidelines for bridging indigenous, traditional, local, and scientific knowledge and knowledge holders to develop community-based observing systems, which build on the needs and interests of indigenous, local and scientific communities, producing findable, accessible, interoperable and reusable (FAIR) data that is readily accessible to community and municipal decision maker as well as the scientific community. Differences and similarities between case studies in relation to observing needs, interests, and legal and institutional capacities will help us develop a draft of the guidelines in preparation for the session. During the session participants will discuss and refine the guidelines and provide recommendations on how to develop a 10-year roadmap for integration of community-engaging and community-owned observing systems into a global observing system.

UNCERTAINTY QUANTIFICATION (ROOM 323 C)

Aneesh Subramanian, University of Colorado, Boulder

Kyla Drushka, University of Washington

Shane Elipot, University of Miami

Oceanography has entered a realm of big data in recent decades, prompting an increased need for data curation and uncertainty quantification. This session will focus on best practices for the derivation, communication, and utilization of the uncertainties of in-situ, derived, and modeled ocean products. Participants will discuss how uncertainty quantification can be incorporated into analyses, observing system design, data assimilation, and other user applications.

U.N. SUSTAINABLE DEVELOPMENT GOALS (ROOM 323 A/B)

Paul DiGiacomo, National Oceanic and Atmospheric Administration

This session will focus on the role of ocean observations and associated research and application development in implementation, monitoring, and reporting in support of the U.N. Sustainable Development Goals (SDGs), especially SDG14 – Life Below Water, as codified in the *2030 Agenda for Sustainable Development*. Given the urgency of a changing ocean and increasing national data needs to ensure the sustainable management of ocean resources, the challenge is to increase significantly the availability and delivery of high-quality, timely, reliable, and sustained data that provide fit-for-purpose SDG information. Mechanisms and solutions to facilitate the delivery of this information will be discussed, likewise the role of the upcoming U.N. Decade of Ocean Science for Sustainable Development in support of this and other global initiatives.

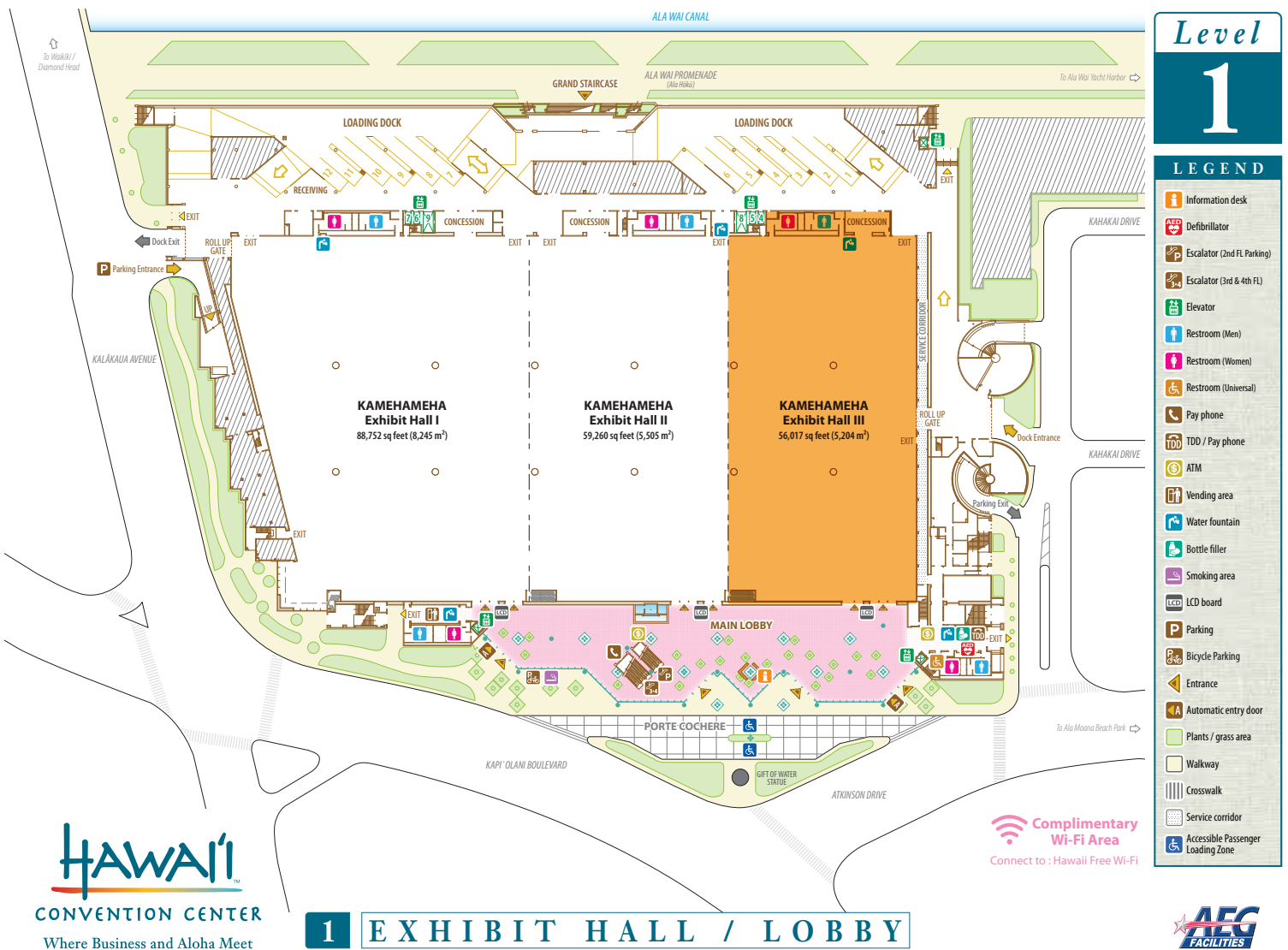
NOTES



A series of horizontal blue lines providing a template for writing notes.

POSTERS & EXHIBITOR SHOWCASE

Conference events are in highlighted areas only.

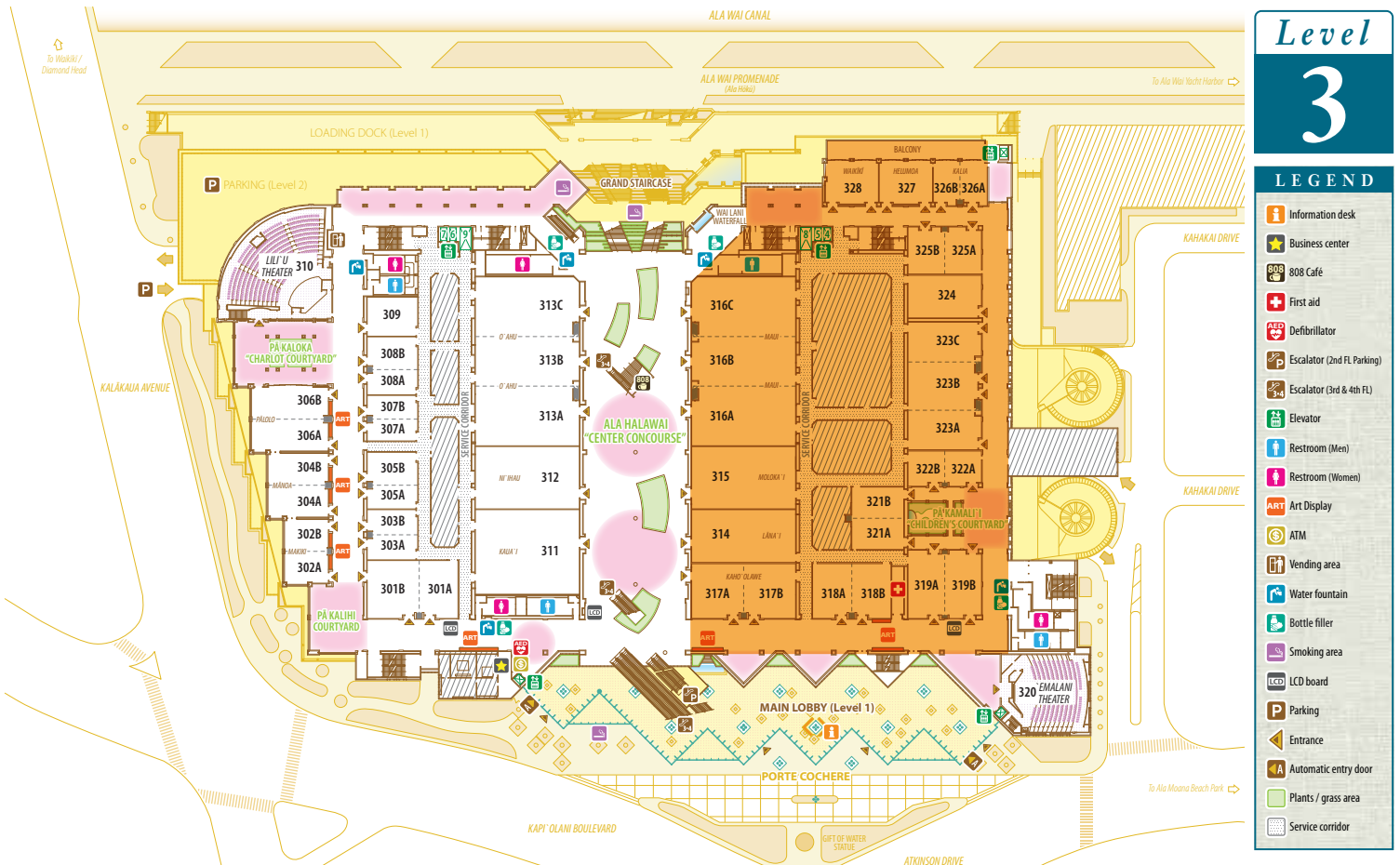


EXHIBITORS

ALSEAMAR
ATLANTIC OCEAN RESEARCH ALLIANCE
COORDINATION AND SUPPORT ACTION (AORA)
BIOLOGICAL AND CHEMICAL OCEANOGRAPHY DATA
MANAGEMENT OFFICE (BCO-DMO) AND CLIVAR
AND CARBON HYDROGRAPHIC DATA OFFICE
(CCHDO)
BLUE ROBOTICS
CODAR OCEAN SENSORS, LTD.
COLLECTE LOCALISATION SATELLITES (CLS GROUP)
CONSORTIUM FOR OCEAN LEADERSHIP
DEL MAR OCEANOGRAPHIC
EUROPEAN GLOBAL OCEAN OBSERVING SYSTEM -
EUROGOOS / ATLANTOS / OCEAN LITERACY
GLOBAL OCEAN OBSERVING SYSTEM -
JOINT WMO-UNESCO/IOC TECHNICAL
COMMISSION FOR OCEANOGRAPHY AND
MARINE METEOROLOGY IN SITU OBSERVATIONS
PROGRAMME SUPPORT CENTRE (GOOS &
JCOMMOPS)
HERCULES CONTROL (HC TECH)
HYDROPTIC
INTEGRATED MARINE OBSERVING SYSTEM (IMOS)
JFE ADVANTECH CO., LTD.
KONGSBERG UNDERWATER TECHNOLOGY, INC.
LIQUID ROBOTICS
MCLANE RESEARCH LABORATORIES, INC
MERCATOR OCEAN INTERNATIONAL / COPERNICUS
MONTEREY BAY AQUARIUM RESEARCH INSTITUTE
(MBARI)
NATIONAL ACADEMY OF SCIENCES:
GULF RESEARCH PROGRAM
NATIONAL AERONAUTICS AND SPACE
ADMINISTRATION (NASA)
NATIONAL OCEANIC AND ATMOSPHERIC
ADMINISTRATION (NOAA)
NATIONAL SCIENCE FOUNDATION (NSF)
NKE INSTRUMENTATION
NORTEK
NORWEGIAN INSTITUTE FOR WATER RESEARCH
OCEAN NETWORKS CANADA
OCEAN SONICS
OCEAN TRACKING NETWORK
OCEANDATALAB
PACIFIC GYRE
PARTNERSHIP FOR OBSERVATION OF THE GLOBAL
OCEANS (POGO)
PLANKTON, AEROSOL, CLOUD, OCEAN ECOSYSTEM
(PACE (NASA GSFC))
PRO-OCEANUS SYSTEMS
PYROSCIENCE GMBH
RBR LTD
ROCKLAND SCIENTIFIC
SAILDRONE
SEABED 2030 (LAMONT-DOHERTY EARTH
OBSERVATORY - COLUMBIA UNIVERSITY)
SOFAR OCEAN
ST. LAWRENCE GLOBAL OBSERVATORY
STATE KEY LABORATORY OF MARINE
ENVIRONMENTAL SCIENCE,
XIAMEN UNIVERSITY (MEL)
STATE KEY LABORATORY OF SATELLITE OCEAN
ENVIRONMENT DYNAMICS (SOED)
SUBC IMAGING
SUBCTECH
SUBSEA TECHNOLOGIES
SUNBURST SENSORS, LLC
TELEDYNE MARINE
THE MARINE ALLIANCE FOR SCIENCE AND
TECHNOLOGY FOR SCOTLAND
THE OCEANOGRAPHY SOCIETY
U.S. DEPARTMENT OF ENERGY
UC SAN DIEGO/ SCRIPPS INSTITUTION OF
OCEANOGRAPHY
UNIVERSITY CORPORATION FOR ATMOSPHERIC
RESEARCH (CPAESS)
UNIVERSITY CORPORATION FOR ATMOSPHERIC
RESEARCH (UNIDATA)
UNIVERSITY OF GHANA/UNIVERSITY OF ENERGY
AND NATURAL RESOURCES
XIAMEN KELUNGDE ENV. ENGINEERING CO. LTD
XYLEM, INC

SPECIAL & BREAKOUT SESSIONS

Conference events are in highlighted areas only.



Level
3

LEGEND

- i Information desk
- ★ Business center
- ☕ 808 Café
- + First aid
- 🚑 Defibrillator
- 🚗 Escalator (2nd Fl. Parking)
- 🚗 Escalator (3rd & 4th Fl.)
- 🚪 Elevator
- ♂ Restroom (Men)
- ♀ Restroom (Women)
- ART Art Display
- 💰 ATM
- 🛒 Vending area
- 💧 Water fountain
- 🚰 Bottle filler
- 🚭 Smoking area
- LCD LCD board
- P Parking
- 🚪 Entrance
- A Automatic entry door
- 🌿 Plants / grass area
- 🚶 Service corridor

HAWAII
CONVENTION CENTER
Where Business and Aloha Meet

3 MEETING ROOM / THEATERS

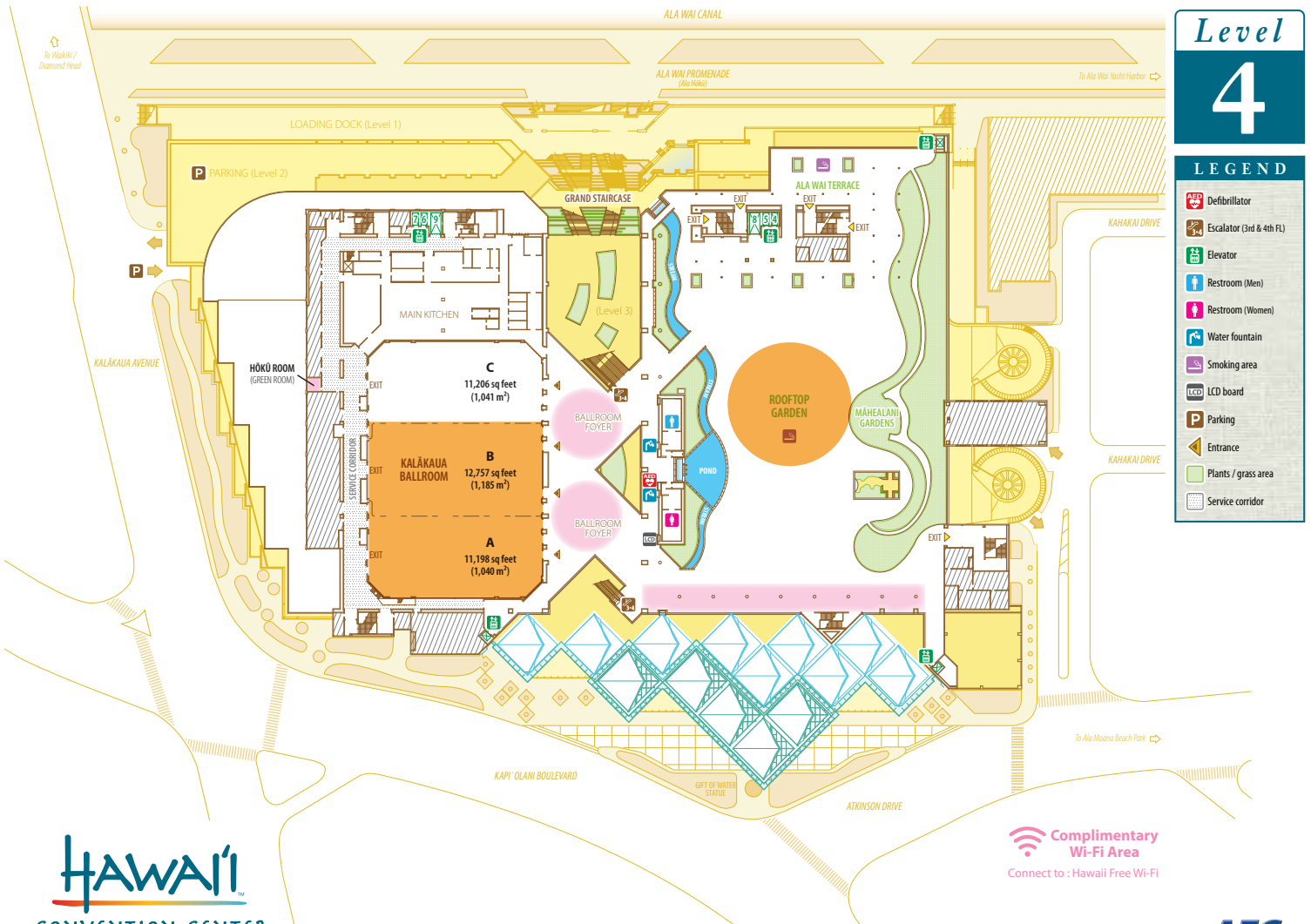
📶 Complimentary
Wi-Fi Area
Connect to : Hawaii Free Wi-Fi



PLENARIES, PANELS, & RECEPTION



Conference events are in highlighted areas only.



Level 4

LEGEND	
	Defibrillator
	Escalator (3rd & 4th FL)
	Elevator
	Restroom (Men)
	Restroom (Women)
	Water fountain
	Smoking area
	LCD board
	Parking
	Entrance
	Plants / grass area
	Service corridor

HAWAII
CONVENTION CENTER
Where Business and Aloha Meet

4 BALLROOM / ROOF TOP GARDEN

Complimentary Wi-Fi Area
Connect to : Hawaii Free Wi-Fi



