United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea

Twentieth meeting

10 to 14 June 2019
(United Nations Headquarters)

Discussion panel
"Ocean Science and the United Nations Decade of Ocean Science for Sustainable Development"

Biographies and abstracts of panellists

Segment 1: Scope and uses of, and gaps in, ocean science

Monday, 10 June 2019

10:00am – 1:00pm

Mr. Vladimir Ryabinin
Executive Secretary, Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization

Bio
Vladimir Ryabinin (Engineer, 1978; Ph.D., 1982; and Doctor of Sciences, 1995) has been the Executive Secretary of the Intergovernmental Oceanographic Commission of UNESCO and Assistant Director-General of UNESCO since 2015. Dr Ryabinin is an oceanographer, marine engineer, climatologist, and emeritus meteorologist of the Russian Federation. His research has led to a number of achievements in the medium-range weather prediction, marine services, offshore engineering, ocean and climate science. He is a key contributor to design of several key international initiatives, such as the Global Ocean Observing System, Joint Technical Commission of the World Meteorological Organization (WMO) and IOC for Oceanography and Marine Meteorology, International Polar Year 2007/2008, and the UN Decade of Ocean Science for Sustainable Development (2021-2030). Some of his previous affiliations include Hydrometcenter of Russia (as a researcher and head of laboratory), Moscow State University (as a lecturer), International Ocean Institute (as the Director), and World Climate Research Programme at the World Meteorological Organization (as a senior scientific officer).

Abstract
"The United Nations Decade of Ocean Science for Sustainable Development"
The purpose of the talk will be to introduce to ICP the motivation and ideas behind the United Nations Decade of Ocean Science for Sustainable Development 2021-2030 (the Decade). The Decade provides a unique opportunity for the world to take ocean science to the level of development that is needed to start more effectively, actively, and successfully addressing existentially important links between the ocean health and sustainable development.

The main issue is the huge scale of undertaking. Everyone depends on the ocean. Yet, the value chain that starts with ocean research and observations and ends with multiple benefits for humanity is hardly documented. Economic incentives of investing in ocean research remain poorly known. A legal requirement to conduct ocean science does not yet exist. Because of that, less than 1/3 of ocean observations for ocean monitoring can be sustainably planned into the future. We know roughly 6% of the ocean depth with the currently feasible and required resolution. The world is lagging behind on implementation of targets of the sustainable development goal 14. Emissions of carbon in 2018 were the highest in the history of our civilization. Ocean science remains underfunded.

The Decade should change this paradigm. By developing a meaningful, ambitious, transformative implementation plan, the United Nations should increase the capacity of ocean science to deliver and be also able to make sure that all countries in the world benefit from ocean knowledge. The core is to make ocean data and information system comprehensive and accessible and to proactively make sure that multiple societal applications can strongly benefit from the new level of ocean data, information and knowledge. It is a very challenging task but, quoting from Nelson Mandela, "it seems impossible until it is done." Yes, we see now that it is within our capacity to organize ocean science in such a way that it would lead to the "ocean we need for the future we want". The main goal of the talk is therefore to convince ICP participants that the currently

achieved level of the Decade planning is already showing very good promise for a successful Decade and to present key ideas to that effect.

This introductory talk will be followed almost immediately by an IOC side event during the lunch break, in which speakers will further elaborate on many aspects of preparations and expected outcomes and outputs of the Decade.

Monday, 10 June 2019

3:00 – 6:00 pm

Mr. John Agard
Director, St. Augustine Centre for Innovation and Entrepreneurship, and Professor of Tropical Island Ecology, University of the West Indies, Trinidad and Tobago

Bio
John Agard is the Director of the University of the West Indies, St. Augustine Centre for Innovation and Entrepreneurship. He is by training a marine biologist and also a Professor of Tropical Island Ecology. His current research interest is in the field of Sustainability Science concentrating on mainstreaming environmental considerations such as biodiversity conservation and sustainable use, as well as climate change impacts and adaptation into the core of policy and decision making.

Professor Agard is a Review Editor of the current 6th assessment of the UN Inter-Governmental Panel on Climate Change (IPCC) and was a Lead Author in IPCC's previous 4th and 5th assessments. He was also a Coordinating Lead Author for the just completed Intergovernmental Science-Policy Panel on Biodiversity and Ecosystem Services (IPBES) Global Assessment on Nature and People. He has also served on the Scientific Advisory Panel of the 2019 United Nations Environment, Global Environment Outlook (GEO6). Finally, he serves as a Member of the Independent Advisory Group on environment and sustainability policy to the Board of the Inter-American Development Bank (IDB) in Washington DC. Professor Agard has also previously served as Chairman of the Environmental Management Authority of Trinidad and Tobago.

Abstract
"***The Status of Ocean Science (for Sustainable Development)***"
At the United Nations, governments have stated that the future they want is to attain in an integrated and indivisible way the 17 Sustainable Development Goals. This is the context for this discussion with regard to the Status of Ocean Science in advancing Sustainable Development. The maintenance of Nature and sustainable use of its gifts to people is essential for achieving the interconnected Sustainable Development Goals. But there are gaps in the Ocean Science required to achieve this. For example, developing a Blue and Circular Economy Model of development that halts the current Business as Usual Model which is largely based on habitat loss, over-exploitation and pollution of the marine environment facilitated by weak high seas governance. For example, some pathways chosen to achieve the SDG's related to clean energy, economic growth, and sustainable consumption and production (SDG's 7, 8 and 12), as well as targets related to no poverty and food security (SDG's 1 and 2), could have substantial positive or negative impacts on nature and therefore on the achievement of other Sustainable Development Goals. Some of the key areas of ocean science that emerge as priorities for research are (a) The Oceans and Human Health, including Coastal Disaster Resiliency; (b) The Ocean's Role in Climate Change; (c) The loss of Biodiversity; (d) De-oxygenation of Coastal Waters; (e) Micro-plastics/Pollution; (f) Exploration of the deep sea.

Mr. Hervé Raps
Medical-Delegate to the Centre Scientifique de Monaco

Bio
I studied general medicine, public health and quality approach in healthcare at the Faculty of Medicine of Nice, then worked at Nice University Hospital until 2008.

Since 2009, I'm the Research Delegate Physician of the Research Agency of the Principality of Monaco, the Monaco Scientific Center.

Part of my activity is to manage the evaluation and funding of clinical research projects in Monaco. The other part is devoted to the WHO Collaborating Centre on Human Health and Sustainable Development, hosted by the CSM.

We develop capacity building material, knowledge translation, and training in environment, climate change, sustainability and human health. Since 2017, we are focused on assessing the health effects of oceans, as a contribution to better understanding the health dimension of SDG 14.

Abstract
"Ocean health, including pathogens in the ocean, changes in the ocean, impact on ocean life and on human life, including relevant environmental, economic and social aspects"
Oceans and seas are changing…they undergo physical changes (temperature elevation, sea level augmentation) and chemical changes (acidification, variations of salinity) and suffer increasingly from pollution. The impacts of these changes on biodiversity and marine ecosystems are well known to the stakeholders and to the general public, due to numerous scientific works and wide communication.

But the impacts of those changes to human health are not so obvious, excepts those from marine extreme events or those endangering seafood security. Although there are great scientific publications and books, there is a lack of awareness and understanding of the health impacts of ocean changes to human health.

The spotlight that has been put on the direct and indirect effects of climate change on human health had a significative impact on the perception of the threat and the necessity to act. We think that assessing and communicating about the health effects of ocean changes could do the same for ocean preservation.

That's why the Centre Scientifique de Monaco, the Boston College, and a global network of scientific collaborators will undertake a special report « Human Health and Ocean Pollution » supported by the Prince Albert II of Monaco Foundation. This report will be a comprehensive and holistic assessment of the impacts on human health of the degradation of the earth's oceans that is taking place today in the Anthropocene epoch.

The final report will be published in a major scientific journal and will be presented at a conference on HUMAN HEALTH AND THE OCEAN IN A CHANGING WORLD to be convened in Monaco on May 11-13, 2020, organized by the Prince Albert II Foundation and the Centre Scientifique de Monaco and its WHO Collaborative Center on sustainable development and human health.

Ms. Elva Escobar-Briones
Universidad Nacional Autonoma de Mexico, Directora del Instituto de Ciencias del Mar y Limnologia, Mexico

Bio
Ms. Escobar is a research scientist from the Institute of Marine Sciences and Limnology at UNAM in Mexico. As a member of the Ecology and Aquatic biodiversity academic unit she contributes with knowledge in biological oceanography studying the marine biodiversity and macroecology of the seabed ecosystems in the Mexican EEZ. She teaches and directs undergraduate and graduate student theses and carries out cruises to record long term changes in the Gulf of Mexico abyssal plain. She is actively publishing in peer reviewed journals books and chapters. With colleagues from the international deep sea scientific community she engaged to help creating Deep sea Stewardship Initiative (DOSI) seeking to integrate science, technology, policy, law and economics to advise on ecosystem-based management of resource use in the deep ocean and strategies to maintain the integrity of deep-ocean ecosystems within and beyond national jurisdiction.

Among the honors and awards to her work she has been recognized a member of the Sistema Nacional de Investigadores and the University PRIDE D, UAM's 2017 best graduated fellow, scientific expert elected member to the Legal and Technical Commission for the international of Seabed Authority, participant in the Census of marine life program, expert to contribute to the EBSA program of the Biodiversity Convention, expert member to the IPCC for the structuring of the special report Oceans and Cryosphere. She is currently the Director of UNAM's Institute of Marine Sciences and Limnology for a second term.

Abstract
"Deep sea biological processes, relevant environmental, economic and social aspects and current gaps"
The deep sea is the largest habitat on our planet, and an area of increasing interest due to the potential for mining the seafloor for valuable minerals and the least observed in spite of over a century of exploration remaining critical knowledge gaps. It provides important services to society such as climate regulation through carbon and heat sequestration, diverse energy, mineral and biological resources in addition to being the world's future water to sustain human life and life in the oceans, and an important repository of biological genetic diversity evolved to contend with high pressure, darkness, low food input and low temperature. Many other services provided by the deep sea remain unknown and required to be economically valued.

I will present a systematic review of literature on deep sea biological processes, their influence in quantifying the value of the deep sea ecosystem services and how these related to society's well-being. Through this review I will cite current knowledge gaps that were identifies and should be urgently addressed to ensure that the world at large benefits from safe, efficient, and environmentally activities in a blue economy framework managed sustainably in the long-term.

Ms. Silvana Birchenough
Principal Ecologist, Advice and Assessment Group Manager, Marine Climate Change Centre (MC3), Cefas Lowestoft Laboratory, International Council for Exploration of the Sea Ecosystem, Processes and Dynamics Steering Group Chair

Bio
I am a researcher and scientific advisor on issues related to ecology and human activities. The focus of my work is on understanding long-term benthic changes resulting from climate change and ocean acidification. Recently, my work has been targeted to understand the potential impacts

of multiple-stressors (e.g. temperature, pH changes and metals) on commercial species, generating science-evidence of these expected effects under a changing climate. I am leading on research in the Caribbean to put into place baselines for carbonate chemistry and fisheries, to safeguards the commercial species. I chair of the ICES 'Ecosystem Processes and Dynamics Steering Group' (EPDSG) overseeing the work of 20 Expert Groups across ICES. I also chair the ICES Benthic Ecology Working group (BEWG). I represent Cefas at the UK Healthy & Biologically Diverse Seas Evidence Group (HBDSEG) benthic-subgroup. I am an associated editor of ICES Journal of Marine Science and Estuaries and Coasts. Currently, I am a senior advisor of the Chilean Project "Multiple stressors and socio-economic indicators in commercial species"-Musels). I am a Fellow of the Winston Churchill Travel Foundation obtained for dedicated research on benthic ecosystems. Recently I recently conducted an OECD Fellowship as part of my R&D project "Optimizing science, technology and innovation for the study of ocean acidification on commercial species (OSTIONES)".

Abstract

"Benthic changes resulting from climate change and ocean acidification"

Evidence has demonstrated that absorption of atmospheric carbon dioxide (CO2) in the ocean has already decreased pH levels by 0.1 pH units since 1750, and CO2 concentrations are projected to rise further by the end of the century as fossil fuel reserves continue to be exploited. Over the last 10 years, ocean acidification (OA) research has increased considerable to advance the current understanding on how these effects may affect different species. However, whilst the research is progressing, there many gaps in knowledge, in some instances there are still contradictory responses observed. Some studies showing strong effects for some species, whilst other studies are showing minimal consequences for some species and overall ecosystems. Some uncertainties are associated with what will be the effects of ocean acidification and climate change will be on commercial species and what will be the expected economic consequences. These gaps have prompted considerable interest among scientists and increasing concerns for policy makers, NGOs and the fishing industry, as OA research has demonstrated dramatic potential future consequences for aquatic ecosystems worldwide. Laboratory studies and field observations have shown several levels of responses of marine ecosystems through to minimal effects or benefits to major disturbances. This presentation will cover climate and ocean acidification effects with the view to offer current state of knowledge on this area of research.

Mr. Francisco Werner

Director of Scientific Programs and Chief Science Advisor, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, US

Bio

Francisco "Cisco" Werner is Director of Scientific Programs and Chief Science Advisor of U.S. NOAA's National Marine Fisheries Service. In this capacity, he leads NOAA Fisheries' efforts to provide the science needed to support sustainable fisheries and ecosystems and to continue the progress in ending overfishing, rebuilding fish populations, saving critical species, and preserving vital habitats. As Director, Cisco supervises the planning, development, and management of a multidisciplinary scientific enterprise of basic and applied research. He oversees NOAA's Fisheries Science Centers, labs and field stations, and the Office of Science and Technology. Cisco's research has focused on the oceanic environment through numerical models of ocean circulation and marine ecosystems. He has studied the effects of physical forcing on lower trophic levels and the subsequent effect on the structure, function and abundance of commercially and ecologically important species, and has contributed to the development and implementation of ocean forecasting systems. Prior to taking his position as NMFS' Chief Science Advisor, he was the Director of NOAA Fisheries' Southwest Fisheries Science Center, Director and Professor of Rutgers University's Institute of Marine and Coastal Sciences, and Professor and Chairman of the

University of North Carolina at Chapel Hill's Department of Marine Sciences, and served as Chair of the GLOBEC (Global Ocean Ecosystem Dynamics) Program's Scientific Steering Committee. Cisco received his BSc in Mathematics and PhD in Oceanography, both from the University of Washington.

Abstract

"Ocean science in support of sustainable fisheries"

Sustainable seafood is among the most environmentally efficient source of protein globally. Wild-capture and farmed fish are essential for ensuring sustainable supplies of seafood, with well-managed harvested fisheries and environmentally responsible marine aquaculture playing increasingly important roles in our food supply, our health, and the environment. Sustainable seafood (https://www.fisheries.noaa.gov/insight/understanding-sustainable-seafood) must consider social and economic outcomes for fishing communities, as well as science-based plans to prevent overfishing, rebuilding depleted stocks, minimizing bycatch and interactions with protected species, as well as conserving habitat. Our understanding of the oceans' role in the planet's ecosystem has advanced significantly in the past decades. While there has been steady progress towards increased understanding of the use of the oceans and their resources, there remain gaps and disparities in knowledge in our ability to make informed decisions (http://undocs.org/a/74/70) in the management of our resources. These include understanding the oceans' ecological limits, tipping points and ecosystem services, the coupled ocean-climate system, marine biodiversity, as well as the establishment of management tools, new technologies, genetic approaches, disease control, marine spatial analysis, and habitat protection, among others. In this presentation, selected gaps and challenges in the context of next decade's needed improvement in ocean sciences to support sustainable fisheries will be discussed, and possible ways forward considered.

Tuesday, 11 June 2019

10:00 am – 1:00 pm

Mr. Francisco A. Arias-Isaza
Director-General, Invemar, Institute for Marine and Coastal Research, Colombia

Bio
Francisco Arias-Isaza is the Director of the Colombian Marine and Coastal Research Center – INVEMAR. Holds university degrees from the Département de Geologie et Oceanographie. Université de Nantes. Nantes - Francia D.E.A. Images et Mer Maestría en Planificación y Administración del Desarrollo Regional, Marine Biology and Expert in Chemistry and Biology, Universidad Jorge Tadeo Lozano. Bogotá – Colombia, appointed as the first General Director of INVEMAR after the creation of the national Environmental System in1995 with only a handful of researchers, he has brought INVEMAR to be the most important Colombian marine research center, covering four major scientific programs in 1) Biodiversity, 2) Marine Geosciences, 3) Marine Pollution, 4) Use of Marine Resources and Coastal Management and one Coordinating Unit for Marine and Coastal Management. The institute is conducting research along all coastal areas of Colombia and abroad with cooperation agreements with neighbour countries. INVEMAR has gained a well known national and international reputation as a leading institution especially in Latin American and the Caribbean Region.

Mr. Arias-Isaza has been the leader of the Integrated Coastal Zone Research Group of INVEMAR, a multidisciplinary set of individuals that has produced more than 100 publications in the last 15 years. The group has placed and lead the conceptual layout of the national policy on coastal management and the different developments that has enriched the sound management of coastal zones in the country, examples of which are: the establishment of new marine protected areas, the declaration of the Sea Flower Biosphere Reserve, the vulnerability definition of coastal areas of the country related to climate change, the adaptation plans for Cartagena de Indias, San Andres and other coastal cities, the information networks for monitoring of different environmental indicators, among other achievements. Finally I have been supporting negotiations of Colombia in different environmental international scenario, such as the Biodiversity, Climate Change, Ramsar, and other regional agreements. Mr. Arias-Isaza is a member of the EPG group for the Decade of the Oceans.

Abstract
"Science applications to ocean management"
"You can´t manage what you can´t measure" this affirmation renders importance when you manage an environmental, socio-economical and an ever-changing system such as the ocean. Uncertainties and errors in management are likely proportional to lack of information on natural processes, economical and social trends, and their interactions.

Ocean management will comprehend a number of disciplines including natural and social sciences, moreover recently, traditional knowledge is also being valued as a source of data, especially in areas where there is little or non-existence information.

Communication gaps between science and ocean managers is common, science needs a proper language and timing. Managers should learn to ask sound questions and to use science. Crucial is to connect both worlds.

Management a complex system as the ocean needs robust science, reliable information and feedback to respond emerging questions. Ocean science is technologically demanding and specialized in workforces. Budget and education strategies are needed to develop equipment and ocean science people.

One ocean science does not fit all. Differences between historical data availability, research coverage, capacities, social and economical, cultural approaches, among others, should promote tailored science to particular needs; international cooperation has proved to be a mean to enhance scientific capacities and coverage. Decade of the ocean is an opportunity.

Managers are not only government officials, stake-holders deciding on its interests are indeed ocean managers, governmental decision makers respond to public interests while the others for its individual benefits. Reaching proper interventions well depends on the availability and quality of the information provided by science to be used by both.

Example on science solving conflicts and fisheries management in the Pacific of Colombia is presented.

Mr. Miguel Marques
PricewaterhouseCoopers Economy of the Sea Project Lead, Portugal

Bio
Miguel Marques, as PwC Partner, leads the PwC's Economy of the Sea Global Center of Excellence, which is focused on blue growth, the promotion of economic development, creation of new jobs and protection of the environment, through sea industries like shipping, ports, shipbuilding and other industries. He's particularly focused on family businesses related to sea activities, as they have the perfect "patient capital" profile to invest in blue businesses that develop over a longer period of time.

A subject matter expert on the blue economy, Miguel is author of more than 70 economy of the sea reports and studies (e.g. HELM – PwC Economy of the Sea Barometer World) and regularly speaks at conferences and other events, attends meetings with shareholders, boards of directors, and senior management, around the world, sharing insights and best practices. He is regularly invited as keynote speaker in relevant international blue economy forums and has also been featured in a number of reputable journals and newspapers.

Miguel Marques has a degree in Economics from Porto University (Porto – Portugal), has a Post-graduation in Real-estate Management from Porto Business School (Porto – Portugal), has an Executive Course in Leadership from Lisbon Catholic University (Lisbon – Portugal), has Executive Courses in Family Business from INSEAD (Fontainebleau - France) and from Kellogg Northwestern University (Chicago – EUA) and is Chartered Accountant. He is member of several advisory boards of entity related to the ocean.

Abstract
"Ocean science in support of blue growth/a blue economy"
Addressing ocean science in support of a blue economy, Miguel Marques, PwC Economy of the Sea Project Leader, presents a synthetic analysis of the blue economy around the world, result of over 15 years of data gathering and over 70 reports, with the objective of highlighting underlining knowledge gaps.

Whether termed the Economy of the Sea, Blue Growth, Ocean Economy or the Blue Economy, all have in common an integrated approach, encompassing sustainability, growth, employment

and innovation. To be implemented successfully, an integrated approach needs to find mutual gains: complementary solutions and win-win strategies for various industries, entities and countries.

The use of the ocean is not balanced. An integrated approach enables us to reduce inherent tensions and achieve a more balanced use of the oceans.

The promotion of the Blue Economy is an answer to global megatrends, most notably: rapid urbanisation, technological breakthroughs, climate change and resource scarcity, demographic and social change, and the shift in global economic power, with impact on all UN Global Goals for Sustainable Development.

It is important to recognise that the oceans are far from being homogeneous, and that we need a call to action for both Nature and Socio-Economic Scientists.

Mr. Martin Visbeck
Professor for Physical Oceanography, GEOMAR Helmholtz Centre for Ocean Research Kiel and Kiel University, Germany

Bio
Martin Visbeck is head of research unit Physical Oceanography at GEOMAR Helmholtz Centre for Ocean Research Kiel and professor at Kiel University, Germany. His research interests revolve around ocean dynamic and the ocean's role in the climate system, integrated global ocean observation and ocean sustainable development. As the speaker of the German excellence initiative "The Future Ocean" in Kiel, he is involved in integrated marine sciences bringing together different disciplines to work on marine issues. He is leading the EU AtlantOS Project on sustained ocean observing in the Atlantic. He serves on a number of national and international advisory committees including the Governing Board of the International Science Council (ISC), Joint Scientific Committee of the World Climate Research Programme (WCRP), leadership council of the Sustainable Development Solutions Network (SDSN), Executive Planning Group for the UN "Ocean Science Decade for Sustainable Development 2021-2030" and co-chair of the sponsors committee for OceanObs19. He chairs the German Sustainability Platform 2030 and the Advisory Committee for Earth Observations at ESA. He is President of The Oceanography Society (TOS), and was elected fellow of the AGU, AMS, and the European Academy of Sciences. Martin Visbeck is involved in strategic planning and decision-making processes about the ocean and sustainable development at a national, European and global level.

Abstract
"Sustained global ocean observing systems serving operational service, science and sustainable development"
The ocean covers more than 70% of the Earth surface and provides a wide range of ecosystem services to humanity is also is a source of marine related hazards and of growing economic relevance to human development. The growth of seamless earth system forecasting means that for example meteorological services need an increasing amount of quality information about the ocean and the atmosphere above the ocean surface in order to be able to deliver the weather, marine and climate services. Global ocean observing from space and in-situ supports scientific discovery, in particular in the deep sea, scientific understanding of the full ocean system. Those insights, data sets and ocean information is urgently needed to inform ocean management decisions about protection and sustainable us of the ocean space. The OceanObs19 conference in Hawaii later this year and the UN Decade of Ocean Science for Sustainable Development will advance global growth and coordination of ocean observing, improve data delivery the production and equitable sharing of critical ocean information. Opportunities to support more

integrated, better mandated, more sustainably resourced, more coherently executed and more optimal designs of ocean observing systems are presented.

Mr. Peter Kershaw

Chair, Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP)

Bio

Peter Kershaw is based in the United Kingdom, with a background of a 35-year career as a research scientist focussed on the impacts of a range of contaminants and human activities on the marine environment. He now divides his time between working as an independent consultant and providing advice to a number of UN agencies and other public-sector organisations, mostly in the area of marine litter and microplastics. Currently he is Chair of GESAMP (Joint Group of Experts on Scientific Aspects of Marine Environmental Protection), an inter-agency body of the United Nations, set up to provide independent and authoritative scientific advice to the ten UN agencies that it supports.

Abstract

"***Use of science for advising the UN system""***

The presentation will focus on the work of GESAMP, a unique inter-agency body of the United Nations that provides independent and authoritative advice to the ten UN agencies it serves, on a wide variety of marine environmental protection issues. GESAMP celebrates its 50th anniversary in 2019.

Ms. Karen Evans

Member, Group of Experts, Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects

Bio

Karen Evans is a Team Leader and principal research scientist with CSIRO Oceans and Atmosphere based in Hobart, Tasmania. She is involved in research focused on improving scientific understanding and developing options for sustainable marine resource management, particularly in relation to national and international fisheries. She also leads research aimed at improving reporting of biodiversity assessments at nation, regional and global scales and providing baseline information for assessing the impacts of oil and gas activities on the marine environment. Karen's expertise and international reputation has seen her contribute to UN regular processes such as the Integrated Global Assessment of the Marine Environment, Including Socio-economic Aspects and the World Meteorological Organisation Joint CAgM/JCOMM Task Team and Weather, Clanmate and Fisheries. She is co-chair of the Integrated Marine Biosphere Research project's regional programme 'Climate Impacts on Top Predators' (CLIOTOP), an associated editor of the Proceeding of the Royal Society B: Biological Science and a member of the Executive Planning Group for the UN Decade of Ocean Science for Sustainable Development.

Abstract

"***The Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects"***

In 2004, the United Nations (UN) General Assembly approved a regular process to report on the environmental, economic and social aspects of the world's ocean. The Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects produced the first global integrated assessment of the marine environment in December 2016 (known as the first World Ocean Assessment). This assessment, the first of its kind

concluded that growing populations, economies and the agricultural and industrial requirements for feeding, clothing and housing the world's population are seriously degrading parts of the marine environment, especially near the coast. The second assessment, to be delivered in December 2020, will build on the baselines included in the first assessment with a focus on establishing trends in the marine environment with relevance to global reporting needs such as those associated with the UN Sustainable Development Goals. The UN Decade of Ocean Science for Sustainable Development provides an opportunity to progress the capacity development needed and strengthen the science policy interface required for sustainable use of the global ocean. Establishment of clear linkages between the Regular Process and the Decade will facilitate the enhanced understanding of ocean processes, activities and decision making required to support sustainable development whilst maintaining a healthy ocean into the future.

Mr. Carlos Garcia-Soto
Vice-chair, European Marine Board

Bio
Carlos Garcia-Soto is Director of International Relations and Senior Researcher of the Spanish Institute of Oceanography. He is Vice-Chair of the European Marine Board, Vice-president of the European Centre for Information on Marine Science and Technology, and member of the Steering Committee of the European Network of Excellence Euromarine. At the United Nations, he is national delegate at the Conference of the Parties of the UN Framework Convention for Climate Change, the UN Intergovernmental Conference on BBNJ, and the International Seabed Authority. He is also expert on the List of Experts for special arbitration on marine scientific research, and member of the Group of Experts of the UN Regular Process. He has been nominated for the National Council of Climate and the National Council of Maritime Safety of the Spanish Government.

He has produced more than 70 scientific works, and is Principal Investigator of 2 active Research Projects of the European Union on Climate Change and Fisheries, and on Blue Economy. Guest Editor of the scientific journal Deep-Sea Research 2, and Member of the Editorial Board of the scientific journal Continental Shelf Research. Lecturer of the European Master on Marine Environment and Resources integrated by 4 European universities: Southampton University and the Universities of Bordeaux, Liege and the Basque Country. He has been awarded a Mention of Honour "Science in Action" by the Spanish Foundation for Science and Technology, the Spanish Royal Society of Physics and the Spanish Royal Society of Mathematics.

Abstract
"Marine Science for a Sustainable Future"
In November 2017, the European Marine Board (EMB) began work on the new installment of its flagship series, Navigating the Future V (NFV). A central goal of NFV is to provide robust, independent scientific advice and expert opinion on future seas and ocean research. 20 leading European experts in the field of marine science and related disciplines were nominated by EMB Member Organizations. The resulting Navigating the Future V publication has been written by the marine scientific community in a format accessible to International, European and national research programme managers, policy-makers, industry and the marine and wider earth system science community itself. It will be communicated widely to stakeholders and should be regarded as an authoritative foresight report on European marine science. NFV will be published on 11 June 2019 at the EurOCEAN 2019 conference.

The Chapters of NFV are:
1. Introduction
2. A four-dimensional and connected Ocean
3. A multi-stressed and rapidly changing Ocean

4. Science of surprises
5. Sustainability science for the Ocean
6. Novel technologies, data and modelling for ocean research
7. Recommendations

http://www.marineboard.eu/navigating-future-v

Segment 2: International cooperation and coordination in advancing ocean science and addressing related gaps

Tuesday, 11 June 2019

3:00 – 6:00 pm

Mr. Jens Kruger
Manager, Ocean Affairs, Pacific Community

Bio
Jens has lived, studied and worked in the Pacific region since 1986. He is the Manager for Ocean Affairs at the Pacific Community, SPC, where he manages multi-disciplinary applied research projects and leads the regional maritime boundaries programme of work and associated capacity building activities. He has a particular interest in coastal hazard risk assessments and the use of these in managing the development challenges of Pacific Small Island Developing States. In 2018 Jens was appointed a member of the Executive Planning Group for the UN Decade of Ocean Science for Sustainable Development. He is also the Vice-Chair of the Pacific Islands Marine and Ocean Service Panel and a founding member of the Pacific Geospatial and Surveying Council.

Jens is a graduate of the University of the South Pacific, Fiji, and completed a MSc at the University of Waikato, New Zealand. He has over 25 years of experience in marine surveys, coastal oceanography and project management and has worked in over 20 countries. This has taken him from the horizontal sleet storms of the north Atlantic to the sweltering heat of the Arabian Sea, and from seismic vessels to dugout canoes in the Pacific. This work in industry and with intergovernmental organisations has resulted in more than 80 publications including technical reports, maps, scientific papers and book chapters.

Abstract
"Approaches and initiatives in the Pacific to address capacity-building needs in ocean science"
The Pacific Ocean is the world's largest ecosystem and the 22 Pacific Island Countries and Territories (PICTs) have a shared stewardship of over 28 million square kilometres of ocean space, or 20% of the world's Exclusive Economic Zones. Together we have a Blue Pacific identity that reaffirms our connections and sense of belonging, and drives our collective action for sustainable development in our region.

Collaboration at the regional level is aided by institutional arrangements that include the Council of Regional Organisations of the Pacific (CROP) agencies - the Pacific Islands Forum Secretariat (PIFS); the Pacific Community (SPC); the Secretariat of the Pacific Regional Environment Programme (SPREP); the Pacific Islands Forum Fisheries Agency (FFA); and the University of the South Pacific (USP), amongst others. Several of these CROP agencies provide capacity building, including formal, tertiary and vocational training. For example, USP offers a marine science programme, and SPC coordinates ocean science training through the Climate and Oceans Support Program in the Pacific (COSPPac). However, the Global Ocean Science Report found that PICTs have one of the world's lowest capacities in ocean science.

The UN Decade of Ocean Science for Sustainable Development has to be instrumental in reducing the inter-regional disparities that exist in the capacity to conduct and apply ocean science. Capacity building efforts in the Pacific need to involve CROP agencies and apply appropriate facilitative and collaborative processes, mechanisms and systems that result in the achievement of 2030 Agenda. Such approaches and initiatives must be needs driven, include PICTs as

traditional knowledge holders, and recognise the special case of Small Island Developing States (SIDS).

Mr. Essam Mohammed

Head, Inclusive Blue Economy, Principal Researcher, Ocean and Fisheries Economics, International Institute for Environment and Development

Bio

Essam Yassin Mohammed is Head of Inclusive Blue Economy with IIED. Prior to IIED he was former Head of Fisheries Promotion Unit at the Ministry of Fisheries of Eritrea. In addition to his academic and professional experience as fisheries scientist, he is an expert in economic valuation of the environment. In his capacity as head of inclusive blue economy, he works on a wide range of topics from economic valuation of environmental goods and services and fiscal reforms to interconnectedness between high seas and territorial waters and influencing policy processes to promote fair, inclusive and sustainable economies both at national and global levels. Essam has more than 18 years of international, multi-country experience in Sub-Saharan Africa, (South, South East, and East) Asia, Latin America and Europe.

Abstract

"Approaches and initiatives in Africa to address capacity-building needs in ocean science"

Coastal African states have lived off the bounty of the oceans for thousands of years. Coastal and marine environments provide vital benefits to humankind – they supply fish, help regulate the environment, and facilitate the movement of goods and people. Fisheries alone provide multiple benefits to impoverished coastal communities. As well as being a major source of food, fisheries provide employment for millions of men and women – at least 10 million in Africa alone. Agenda 2063, the African Union's 50-year vision and action plan to accelerate the continent's development dully recognises this. The Agenda recognises the blue economy as the main driver for social and economic transformation in the continent. Moreover, the Decade of African Seas and Oceans was launched on 24 July, 2015. Despite the high-level recognition of the significance of African ocean and seas, technical and institutional capacity gaps still persist. The presentation will demonstrate some existing initiatives to fill capacity gaps and identify areas of high priority for the UN decade of ocean science for sustainable development.

Ms. Diva Amon

Marie Sklodowska-Curie Fellow, Natural History Museum, United Kingdom, and Co-Founder and Director SpeSpeas, Trinidad and Tobago

Bio

Diva Amon is a Trinidadian deep-sea biologist who studies deep-sea megafaunal communities and human impacts on the deep ocean, especially related to deep-sea mining. Diva is also interested in increasing the capacity of low to middle income countries to explore their deep oceans, as well as bridging the gap between science and policy especially regarding the ISA and UN BBNJ. She is currently undertaking a Marie Skłodowska-Curie research fellowship at the Natural History Museum in London, UK, studying the megafaunal communities of seamounts in the Prime Crust Zone in the Pacific Ocean. In 2013, she completed her PhD at the University of Southampton, UK, after which, she spent three years at the University of Hawai'i, USA, researching the largely unknown abyssal fauna of the Clarion-Clipperton Zone. Throughout her career, Diva has participated in deep-sea expeditions around the world, exploring and studying previously unknown habitats. She has done a considerable amount of science communication and public engagement with her work featured on CNN International, National Geographic, BBC World, etc. Diva is also a Co-Lead of the Deep-Ocean Stewardship Initiative's Minerals Working Group, a

member of the Species Survival Commission's Marine Conservation Committee of the IUCN, and a co-founder of the non-profit NGO, SpeSeas, dedicated to marine science, education and advocacy in Trinidad and Tobago and the wider Caribbean.

Abstract
"Approaches and initiatives in Trinidad and Tobago to address capacity-building needs in ocean science"
The ocean occupies the majority of the total area of Trinidad and Tobago. This large expanse encompasses coral reefs, mangroves, seagrass beds, deep-sea habitats and more, which provide a number of ecosystem services that benefit our small island developing state. These include water and air purification, climate regulation, providing habitat, recreation and health benefits, as well as resources such as oil and gas that have near solely sustained our economy for decades. Unfortunately, there are many barriers that prevent our nation from fully exploring, understanding and managing our waters and the communities within, such as a lack of financial, technical and technological capacity. However, there are a number of initiatives being undertaken locally that are promoting ocean science and stewardship. During my presentation, I will detail some of the exciting and cutting-edge approaches being employed locally by SpeSeas, a non-profit NGO that undertakes ocean research, education and advocacy, with other partners.

Mr. Wijemuni Nipuna Mahin Zoysa
Director General, National Aquatic Resources Research and Development Agency, Sri Lanka

Bio
Eng. Wijemuni Nipuna Mahin Zoysa is a Communication & Electronic Engineer in profession. He was graduated at UCSI University, Malaysia in 2010. His specialization is in the field of Electronics and Communication Engineering. From 2010 – 2013 he has served as Assistant lecturer in Electronic Engineering and visiting lecturer in ICBT Campus, Kandy.

Ever since he has rendered his knowledge, experience to develop research in the field of Electronics. Mr.Zoysa published and presented the paper on Fetal Phonocardiography Signal Processing with a Wiener Filter, at the Annual Conference 2011 organized by IET Younger Members Section Sri Lanka also published and presented paper on an Eigenfilter based approach for extraction of fetal heart signals under noisy condition using adaptive filters, to the CIMSIM2012 4th-International Conference held at Kuantan (Malaysia) in 25-27/09/2012. And many more international and national publications were released by him during his academic career.

Eng. Zoysa is a young entrepreneur, who was the Chief Operating Officer at 3OPP Lanka (Pvt) Ltd. a reputed company in telecommunication solutions from 2010-2015 and a proud member of the introducing team of FTTH (Fiber to home) technology to Sri Lanka (2013).

In 2018 he held the position of Managing Director in Ceylon Fisheries Corporation, and took the responsibility in building and implementing a purchasing region in eastern cost (war affected area) of Sri Lanka in order to enhance fishery production, with special concern on reducing postharvest loses. Currently Mr. Zoysa holds the position of Director General, at National Aquatic Resources Research and Development Agency, Sri Lanka

Abstract
"Approaches and initiatives in Sri Lanka to address capacity-building needs in ocean science"
Fisheries resources are of great significance to the lives of communities and economy of Sri Lanka. As an Island nation with 200 miles exclusive economic zone under its jurisdiction and heavy reliance on fisheries resources, the capacity of human and physical resources to ensure long term sustainability, responsible fisheries management and development are worthy of consideration.

This presentation discusses the opportunities and challenges to conserve, manage and development of marine fisheries and an analysis of the special requirements of Sri Lanka is made with particular attention on capacity building.

Mr. Ariel Troisi
IOC Vice Chair, Chair of IOC CD Expert Group, Servicio de Hidrografia Naval, Argentina

Bio
MSc, Captain, Ariel Hernán TROISI obtained his degree in Physical Oceanography at Instituto Tecnológico de Buenos Aires in 1988, and later obtained a Master's Degree in Science and Technology Policy and Management at the Universidad de Buenos Aires. He has a long history of involvement in marine scientific research, project management and associated services, as well as in matters related to the activities, programmes and functions of the Intergovernmental Oceanographic Commission IOC of UNESCO. Since June 2015 serves as Vice-chairperson of IOC for Electoral Group III, Latin America and the Caribbean. In this capacity, he chairs or co-chairs different groups including the Intersessional Working Group on the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction, the Group of Experts on Capacity Development and the Joint WMO-IOC Consultation Group on the Reform of JCOMM. His activity in public and international affairs has allowed him to understand the relative situation, needs and requirements both at global and regional level. Mr TROISI is also as Technical Coordinator of the National Commission of the Outer Limit of the Continental Shelf.

Abstract

"Capacity development and transfer of marine technology as cross-cutting issues of the United Nations Decade of Ocean Science for Sustainable Development"
The need to generate scientific knowledge and its availability as a support to decision-making, the construction of robust science-policy / decision making interfaces, as well as technological advances inevitably entail the need for the creation and development of adequate capacities and mechanisms for the transfer of marine technology.

Capacity Development must be interpreted in an integral manner considering its different dimensions: a) training and capacity development of human resources, b) access to and strengthening of infrastructure for marine scientific research, c) resources and financing; d) visibility, promotion and awareness, e) optimization of global, regional, sub regional coordination and collaboration mechanisms, f) scientific knowledge for the development of policies and actions for sustainable development.

Similarly, the transfer of marine technology should also address access to physical infrastructure, the possibility of participation in research projects, access and adequate use of data and information, access to knowledge and technical expertise, manuals, guidelines, standards and best practices.

The Decade will mobilize the ocean community behind the ideas of sustainable development and will serve to focus research and technological development on existentially important issues of protection and sustainable use of the ocean. This will be a decisive contribution to the implementation of the Sustainable Development Goals (SDGs), not only the SDG 14 "Oceans", but several others to which it is related.

Current challenges, as well as emerging issues, require clearly identifying needs and vacancies in terms of capacity development and technology transfer in order to inform, on the one hand, actions for the restoration and maintenance of the health of the ocean and, on the other, the use of the ocean and its resources within a framework of sustainable development.

Ms. Karin Kroon Boxaspen
Research Director, Norwegian Institute of Marine Research

Bio
Ms. Boxaspen is working at the Institute of Marine Research (IMR) that is with its over 1000 employees, one of the largest marine Institutes in Europe. IMR is the main advisor to the Norwegian Ministry of Trade, Industry and its underlying Directorates and Agencies within Norway in matters of the Ocean. This includes stock assessment, sustainable aquaculture, safe and healthy seafood and environment and climate change.

Ms. Karin Kroon Boxaspen is Research Director and responsible for the formal Advisory Process within IMR. She also manages through the underlying 9 project programme directors, the project portfolio of IMR. She was before this the Head of the Programme for Aquaculture Research and Advice for 6 years Ms. Boxaspen has worked specifically on developing the advice for this area internationally as co-chair for the ICES working group on Aquaculture (WGAQUA). Her area of research expertise is the salmon lice (ecto parasite) which cost the Norwegian Salmon farming industry upwards to 5 billion NOK/year. She is one of the international experts in this field and have been appointed and has led the Norwegian national advisory process for combat of this parasite through the new "production area legislation".

She received a siv.ing (MSc) in biotechnology from the Norwegian Technical University, (now NTNU) in 1986. She earned her Dr Scient at University of Bergen, Chemical Department in 2002 on the work "Use of natural biocides against the ectoparasitic salmon lice on Atlantic salmon. She has worked at IMR since 1987.

Abstract
"The Science for Ocean Action Conference and input to the High-level Panel for a Sustainable Ocean Economy"
150 invited Ocean experts from more than 50 countries met to discuss critical science-based actions in response to the problems facing the oceans. Five specific topics were addressed; Impacts of climate change on marine ecosystems, Ocean Health, State of the Fisheries Resources, Sustainable Aquaculture and the importance of Seafood for Human Nutrition.

Scientific understanding of the Ocean's responses to pressures and management action is fundamental for sustainable development. The action points overall address the requirement for knowledge-development, and marine monitoring programs as well as the importance of ocean and coastal governance. Concerted effort was also highlighted as vital for a balanced economic development with an increased food production combined with protecting the marine environment and its biodiversity.

The conference inputs were concentrated into action points for all topics that will be addressed in the presentation and panel discussion.

Improved communication between scientists and policymakers were also put forward as essential. Mechanisms for this exists both at the global level in the UN (for example the Regular Process producing the World Ocean Assessment), and in the UN specialized agencies such as the FAO, as well as at the regional level such as the International Council for the Exploration of the Sea (ICES) and the North Pacific Marine Science Organization (PICES). In regions where cooperation in marine science is not well established, Large Marine Ecosystems can be a platform for organizing scientific information.

Wednesday, 12 June 2019

10:00 am – 1:00 pm

Mr. Toshio Suga
Professor, Department of Geophysics, Graduate School of Science, Tohoku University

Bio
Toshio Suga is a Professor of Physical Oceanography at Tohoku University and a Visiting Senior Scientist at Japan Agency for Marine-Earth Science and Technology (JAMSTEC). His research interests include ventilation of upper/intermediate ocean, water mass formation/spreading processes, physical-biogeochemical-biological processes and the role of the oceans in climate and climate variability. He has been leading the Japan Argo program as an executive member of the International Argo Steering Team (AST) since 2008 and currently serves as a Co-chair of AST (2018-). He has been active in coordinating ocean observing systems, serving as a member of GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC) (2007-2012), a Co-chair of OOPC (2013-2015), a sci & tech expert member of Global Ocean Observing System (GOOS) Steering Committee (2016-) and a member of Global Climate Observing System (GCOS) Steering Committee (2018-). Also active in a number of international and national scientific programs/organizations, he has been a member of the Japanese committee for WCRP/CLIVAR since 2003, a committee which he chaired from 2003-2005, served as a member of CLIVAR Pacific Panel (2005-2011) and served as a Vice President of the Oceanographic Society of Japan (JOS) (2013-2015). He was awarded the Okada Prize of JOS in 1997 and the JOS Prize (the Prize of the Oceanographic Society of Japan) in 2017 for his outstanding scientific achievements in oceanography.

Abstract
"Current and emerging technologies, including GOOS and Argo, in ocean science"
Ocean science for sustainable development requires sustained global ocean observations. Networks of autonomous observing platforms have been developed for the last couple of decades to meet essential part of this need. An outstanding example of those is Argo, a network of profiling floats measuring temperature and salinity of the top 2000 m of the global ocean along with its thought-out data management system. The Argo program's achievements and future plans taking advantage of new technologies are presented. These demonstrate how new technologies contribute to ocean science with the aid of integration with existing technologies, coordinated international collaboration and creative protocols under legal frameworks. The Global Ocean Observing System (GOOS), an IOC/UNESCO lead program, has been playing a central role in facilitating the development of the integrated sustained global ocean observing system that Argo and other observing networks contribute to. Strategies and challenges of GOOS to contribute to sustainable development are presented.

Ms. Frida Maria Armas-Pfirter
Professor of International Law, University of Buenos Aires, Argentina

Bio
[to be provided]

Abstract
"The legal framework for ocean science"
[to be provided]

Mr. Peter Haugan

Chair of the Intergovernmental Oceanographic Commission (IOC of UNESCO); Co-chair of the Expert Group of the High-Level Panel for a Sustainable Ocean Economy; Programme Director Institute of Marine Research, Norway; Professor, Geophysical Institute, University of Bergen, Norway

Bio

Peter Haugan is programme director at Institute of Marine Research in Norway since 2019 and professor of oceanography at Geophysical Institute, University of Bergen since 1999. He started his ocean science careeer with coastal oceanography at the Nansen Environmental and Remote Sensing Center in 1988, later moved to polar oceanography at the University Centre in Svalbard, climate research at the Bjerknes Centre for Climate Research and finally ocean renewable energy research at the Geophysical Institute. In his present position he has responsibility for a portfolio of activities within development cooperation and global sustainability research.

He has been the elected and then re-elected Chair of the Intergovernmental Oceanographic Commission (IOC of UNESCO) soon for 4 years. At the moment he also serves as co-chair of the Expert Group serving the High-Level Panel for a Sustainable Ocean Economy initiated by the Prime Minister of Norway and comprising 14 heads of state. He has a wide-ranging expertise from coordinating and furthering marine science collaboration and infrastructure development and has also served as a vice chair of the European Marine Board.

Abstract

"Coordination of ocean science at the international level"

The Intergovernmental Oceanographic Commission (IOC of UNESCO) was created in 1960 precisely to coordinate ocean science at the international level. The Scientific Committee on Oceanic Research (SCOR) had been formed shortly before in order to further ocean research, but it was recognized that an intergovernmental body (the IOC) was needed in addition to the nongovernmental SCOR. When the United Nations Convention on the Law of the Sea (UNCLOS) was established, IOC was recognized as the competent body for ocean science in the UN system. The IOC Member States (now 150) have gradually given the organization several roles and responsibilities beyond coordination of ocean science in a strict sense, including scientific support to decision making of Member States, capacity building, standard setting, sustained observations, securing, storing and sharing of data, and services including tsunami warning systems.

Other UN organizations with global scope as well as regional organizations related to the UN and outside the UN system are also involved in coordination of ocean science. There is also a multitude of joint bodies and committees often with participation from both intergovernmental and nongovernmental organizations. One example showing the connection of ocean science beyond the oceanic domain is the World Climate Research Programme (WCRP) which is cosponsored by the World Meteorological Organization (WMO), the IOC and the International Science Council (ISC). Thus, coordination of ocean science at the international level interpreted broadly is a multi-faceted activity with many actors, different rationale and objectives.

A consistent driving force over the past 60 years for truly global coordination of ocean science, has been the recognition that the ocean is too big for any single nation, even the most powerful of nations, to observe, study and understand alone. Division of labor makes sense. Then, for science to make progress, observational data have to be shared. Recognizing the scale of many oceanic phenomena which require observations from a large area in order to be described properly and e.g. in terms of tsunamis and storms to be forecasted in order to save lives, provides another impetus for data sharing. Concerns over cross border pollution, global environmental change give

further motivation for coordination including planning of observation programs and data sharing.

The need for international coordination of ocean science and related activities has probably never been stronger than today. Unless ocean science work is distributed among all Member States with resources, and more Member States are empowered (SDG target 14.a), more lives will get lost, ocean resources will not be harvested in the way which humanity needs and the risk of conflicts increase. The UN Decade of Ocean Science for Sustainable Development (2021-2030) provides a unique opportunity not only to strengthen ocean science and knowledge about the ocean, but also to carefully consider strengthening of the mechanisms for coordination and data sharing. This is particularly relevant to ocean assessments and the yet-to-be-negotiated legally binding instrument for conservation and sustainable use of biodiversity in areas beyond national jurisdiction.

Mr. Michael Lodge
Secretary-General, International Seabed Authority

Bio
Michael W. Lodge is a British national. He received his LLB from the University of East Anglia, and has an MSc in marine policy from the London School of Economics and Political Science. He is a barrister of Gray's Inn, London. Prior to his election as Secretary-General of the International Seabed Authority in July 2016, he had served as Deputy to the Secretary-General and Legal Counsel. Other professional experiences include serving as Legal Counsel to the ISA (1996-2003); Counsellor to the Round Table on Sustainable Development, OECD (2004-2007); Legal Counsel to the South Pacific Forum Fisheries Agency (1991-1995). He has also held appointments as a Visiting Fellow of Somerville College, Oxford (2012-2013), an Associate Fellow of Chatham House, London (2007) and a member of the World Economic Forum's Global Agenda Council on Oceans (2011-2016).

With 28 years of experience as a public international lawyer, Michael Lodge has a strong background in the field of law of the sea as well as ten years' judicial experience in the UK and South Pacific. He spent many years living and working in the South Pacific and was one of the lead negotiators for the South Pacific Island States of the 1995 UN Fish Stocks Agreement. He has also worked as a consultant on fisheries, environmental and international law in Europe, Asia, Eastern Europe, the South Pacific and Africa.

With extensive knowledge of the United Nations and other international organisations, Michael Lodge has facilitated high-level multilateral and bilateral negotiations at international and regional level. His significant achievements include his pivotal role in the ISA from its inception in 1996 and in helping to create and implement the first international regulatory regime for seabed mining. He also contributed to the future security of global fish stocks by leading the process to create the Western and Central Pacific Fisheries Commission from concept to its establishment as the largest regional fisheries management organization in the world, also serving as the interim executive director of the Commission. He was instrumental in advising the Pew Charitable Trusts on their support for the Global Ocean Commission and also acted as an adviser to the Commission on international law of the sea and ocean policy.

Mr. Lodge has published and lectured extensively on the international law of the sea, with over 25 published books and articles on law of the sea, oceans policy and related issues.

Abstract
"Cooperation and coordination in deep-sea marine science"
[to be provided]

Mr. Peter Swarzenski

Section Head, Radioecology Laboratory, IAEA Environment Laboratories, Monaco

Bio

Peter Swarzenski holds a PhD in Chemical Oceanography and is Section head of the IAEA Radioecology Laboratory (REL) in Monaco. At REL Swarzenski oversees support provided to Member States to research diverse marine stressors, including deoxygenation, ocean acidification, marine pollution, harmful algal blooms, and marine plastics.

Prior to joining IAEA, Swarzenski worked for 20+ years as a research oceanographer for the U.S. Geological Survey in Santa Cruz, California USA on marine biogeochemical processes. Recent projects addressed climate-change impacts to Pacific atolls, coastal groundwater, and Alaskan permafrost. Swarzenski applies a variety of tools in his research, including U/Th-series radiotracers and electrical geophysical methods, and has published ~200 papers.

Abstract

"The IAEA's Ocean Acidification International Coordination Centre (OA-ICC): A Hub for the Global OA Community"

As the consequences of global ocean acidification impacts to coastal and marine ecosystems become better described and understood, there is a strong need to better coordinate and promote international collaboration within this research community. To address this, the OA-ICC was established in 2013 by the International Atomic Energy Agency (IAEA) Environment Laboratories in Monaco. Since then, the OA-ICC has implemented and led numerous activities that address three overarching themes: 1) *increasing capacity* in developing countries through organizing training courses, international research projects, and developing affordable research "kits" 2) *disseminating information* on ocean acidification by providing open-access resources to scientists and other stakeholders, including a news stream, a bibliographic database, and a portal for experimental data, and 3) *addressing emerging science questions* in ocean acidification research through organizing expert workshops on key topics, such as the management and access to global ocean acidification data, the development of best practices and the standardization of methodology to increase inter-comparability of results. The OA-ICC supports the Global Ocean Acidification Observing Network (GOA-ON) and several regional OA networks such as the Latin American OA Network (LAOCA) and OA-Africa. A distributed secretariat, with dedicated staff at the IAEA, IOC-UNESCO, and NOAA Ocean Acidification Program, was established in 2018 to advance GOA-ON activities and further international coordination. The OA-ICC is also engaged in the UN Sustainable Development Goal 14.3 reporting process, as part of the 2030 Agenda.

Mr. Ray Dalio

Co-Chief Investment Officer and Co-Chairman of Bridgewater Associates, L.P., Co-founder of OceanX

Bio

Ray Dalio is the founder, chairman and co-chief investment officer of Bridgewater Associates, president of Dalio Philanthropies, and founder of OceanX. Ray and his wife Barbara co-founded Dalio Philanthropies to support an eclectic mix of causes that reflect the philanthropic passions of family members. The foundation supports organizations at all levels of development, from start-ups in need of seed capital to well-established institutions that can bring big and/or novel ideas to fruition. A signature initiative of Dalio Philanthropies, OceanX was created in partnership with Ray's son, Mark. It stems from their deep passion for the oceans, their belief that the oceans are one of the planet's most critical and least-supported and well understood natural resources,

and their desire to "move the needle" on ocean awareness. OceanX and its media production arm, OceanX Media, explore and research the ocean and bring back stories to help audiences worldwide understand that ocean exploration is as or more important than space exploration—with the ultimate goal of creating a global community engaged with understanding, enjoying, and protecting the oceans.

Abstract

"The importance of ocean exploration and taking a collaborative approach"

Oceans are 72% of Earth's surface, yet only 5% of the world's oceans have been explored. We urgently need to explore and better understand the ocean so that we can learn how to manage this precious resource well. OceanX is pursuing a collaborate model to bring together governments, scientific institutions, and philanthropists to step up and recognize this urgent need for exploration—and to increase public awareness of the ocean and its vital important to humanity.

Wednesday, 12 June 2019

3:00 – 6:00 pm

Mr. Dayne Buddo
CEO and Marine Biologist, Alligator Head Foundation, Jamaica

Bio
Dayne Buddo is the CEO for the Alligator Head Foundation (Jamaica) and a Marine Biologist with expertise in marine invasive alien species, fisheries management and marine protected areas.

He currently holds a Bachelor of Science (Hons.) degree in Zoology and Botany and a Doctor of Philosophy degree in Zoology – Marine Sciences from The University of the West Indies (UWI Mona – Jamaica). Dr. Buddo served the UWI as Lecturer and Academic Coordinator 2009-2017, and was stationed at the UWI Discovery Bay Marine Laboratory and Field Station with responsibility for Marine Research and Teaching.

He has published several pieces of work on marine invasive species and fisheries management in the region, including the co-authored book on Lionfish Management in the Caribbean. In addition to marine invasive species, Mr. Buddo also has significant research interests in marine protected areas management, seagrass ecology, fisheries management and sustainable development. He has been a consultant for marine projects for CARICOM, Government of Japan, the World Bank, International Maritime Organization, the Nature Conservancy, among others, and has conducted work in over 30 countries. He has worked closely with the United Nations Convention on Biological Diversity (UNCBD), International Union for the Conservation of Nature (IUCN), United Nations Environment Programme (UNEP), and the Global Environment Facility (GEF), The National Oceanic and Atmospheric Administration (NOAA) among other multilateral agencies.

Mr. Buddo currently serves on several national and regional committees that focus on marine invasive species and marine biodiversity, including the CITES Scientific Authority, Fisheries Management and Development Fund Board and the Marine Park Advisory Board . Most recently, he was asked to serve on a global task force for ballast water by the International Maritime Organization and the United Nations Intergovernmental Panel for Biodiversity and Ecosystem Services. He also sits on the Board of Advisers for The Ocean Foundation based in the United States.

Mr. Buddo has taught courses at the UWI at both the Bachelor's level and the Masters level, and has served and continues to serve as a research supervisor for several Masters and PhD students in marine sciences.

Abstract
"The role of non-governmental organizations in supporting ocean science"
The role of NGOs in supporting ocean science is key to understanding effects of human beings on the marine environment. In many jurisdictions, NGOs have become official management entities of marine protected areas on behalf of governments. NGOs have been given a mandate to develop and implement management strategies and interventions to understand and conserve these marine protected areas. The Alligator Head Foundation (AHF-Jamaica) has been charged with the management of the East Portland Fish Sanctuary, a 6km2 marine no-take area in the east of the island. Additionally, the AHF is the Secretariat for all the 18 fish sanctuaries around the island. The AHF is the only NGO with its own marine laboratory and staff scientists. Its research agenda is set to examine management strategies to enhance the fish sanctuary, providing a adaptive management framework for the sanctuary. This allows the management of the sanctuary to be

based on strong science in a very active and timely manner. This includes monitoring of coral life and fish stocks, water quality, habitat restoration and watershed management. Additionally, through partnerships with other local and international scientists, research that is related to the AHF's mandate is conducted with the involvement of AHF's staff scientists.

Mr. Carlos F. Gaymer

Director, Millennium Nucleus for Ecology and Sustainable Management of Oceanic Islands (ESMOI), Universidad Católica del Norte, Chile

Bio

Associate Professor at Universidad Católica del Norte (Chile), and Director of the Millennium Nucleus of Ecology and Sustainable Management of Oceanic Islands (ESMOI), a center aiming to provide the scientific basis needed for the conservation of marine ecosystems associated with seamounts and oceanic islands of Chile. He is a marine ecologist focused on marine conservation, studying the scientific foundations for the establishment of Marine Protected Areas and their implementation, including community-based strategies, and permanent advising decision-making processes. He is the Southeast Pacific regional coordinator for the World Commission on Protected Areas of IUCN, part of the planning team of the Big Ocean network, and member of the IUCN Large Scale MPA Task Force.

Abstract

"Integrating traditional knowledge into ocean science"

Research on traditional or local ecological knowledge (TEK or LEK), particularly research on customary practices, marine tenures and taboos, is growing in interest among scientists, managers and communities, especially in the Pacific Islands, where the increasing demand for resources needs urgent actions for avoiding their decline. Sustainable fisheries in many Pacific Islands has been achieved through traditional management practices developed by the local fishing communities and based on LEK and customary laws of the indigenous population. Combination of TEK with traditional sciences is allowing to understand nature's rhythms and proposing successful community-based conservation and management strategies that are strongly supported by local communities. Examples from different Pacific Islands including Rapa Nui are discussed to see the potential of integrating TEK in ocean sciences.

Mr. Sergey Belov

Co-chair, International Ocean Data Exchange Programme (IODE), All-Russian Research Institute Hydrometeorological Information, Obninsk, Russia

Bio

Head of subdivision of Russian Scientific Research Institute of Hydrometeorological Information - World Data Center (RIHMI-WDC). Started as a scientific officer in 2001. Obtained PhD degree in system analysis in 2007. Since February 2019 - co-chair of the UNESCO IOC International Oceanographic Data and Information Exchange (IODE). Involvement in international cooperation for 15 years includes following projects, initiatives and group of experts:

- SEASEARCH project;
- EU SEADATANET Project (www.seadatanet.org);
- EU SEADATANET 2 Project (www.seadatanet.org);
- WIGOS Pilot Project for JCOMM;
- WMO Information System (WIS);
- Ocean Data Interoperability Project (ODIP)
- EU SeaDataCloud project;

- EMODnet;
- INTAROS;

Expertise and broad experience in data management and development of heterogeneous information systems in ocean domain. Area of responsibility also includes research and development (R&D) of new modern IT solutions for ocean application, project management and assessment.

Within IODE, he is standing to consolidate activities, reinforce human resources and establish integration and interoperability arrangements between IOC, WMO and other stakeholders to facilitate data management activities, widespread use of best practices, open access to data and information.

Abstract

"International cooperation in data management"

Increasing demands on ocean data and information from different communities together with fragmented and unconsolidated data management approaches leads to difficulties in conducting large-scale science, analysis, modelling and support for decision making. Only joint efforts can stimulate data and information access, sharing and integration aiming at delivering knowledge, products and services more effectively to global user communities.

The programme "International Oceanographic Data and Information Exchange" (IODE) of the "Intergovernmental Oceanographic Commission" (IOC) of UNESCO was established in 1961. Its purpose is to enhance marine research, exploitation and development, by facilitating the exchange of oceanographic data and information between participating Member States, and by meeting the needs of users for data and information products. Main activities of IODE include:

1. Globally accessible portal to distributed ocean data and information sources: development of technological framework and exchange standards
2. Development and updating of national oceanographic data and information management capacity in Member States
3. Global accessible clearing-house service for oceanographic factual and intellectual information
4. Programme strategy, management, inter-agency liaison and outreach

Currently IODE is working on the concept of e-environment where users can discover coastal and ocean data, information and associated products or services provided by IOC Member States, projects and other partners associated with IOC named as IOC Ocean Data and Information System (ODIS). IODE will work with existing stakeholders, linked and not linked to the IOC, to improve the discovery, access, semantic and technical interoperability of existing data and information, and to contribute to the development of a global ocean data and information system, to be referred to as the IOC Ocean Data and Information System (ODIS), leveraging established solutions where possible. First step of the ODIS implementation is ODIS Catalogue of Sources (ODISCat project) - online browsable and searchable catalogue of existing ocean related web-based sources/systems of data and information as well as products and services. ODISCat will contribute to the objectives of the Agenda 2030, and in particular the UN Decade on Ocean Science for Sustainable Development.

Mr. Tarmo Soomere
President, Estonian Academy of Sciences

Bio
Tarmo Soomere graduated in 1980 from Lomonossov Moscow State University as a mathematician, received a Ph.D. in oceanology from the Shirshov Institute of Oceanology, Moscow (1984), and the degree of Doctor of Mathematics (1992) from Tartu University, Estonia. He has been Alexander von Humboldt Fellow in Germany (1994–1997, 2005, and 2011), Visby Fellow in the University of Uppsala, Sweden (2000–2001), and worked for one year in the Centre of Mathematics for Applications, University of Oslo (2006–2008). He was elected as the first Professor of Coastal Engineering in Estonia in Tallinn University of Technology (2005). Currently he is also the President of the Estonian Academy of Sciences.

Prof. Soomere's scientific interests have been mostly concentrated in wave theory and modeling, with specific focus on various processes in the nearshore and preventive methods for the offshore and coastal zone management. In 2002 and 2013 he received the Estonian State Research Award in engineering sciences. He was declared the Person of the Year in Estonia 2005 by the daily newspaper The Postman for his contribution to the forecast of a devastating storm, was elected to the Estonian Academy of Sciences (2007) and to Academia Europaea (2009), received a high state decoration (3rd class of White Star) in 2014, was elected as a foreign member to the Latvian Academy of Sciences (2015), received The Friend of Press award by the Estonian Society of Newspapers (2017), and was inaugurated as Honorary Professor of Klaipeda University (Lithuania) in 2018.

Abstract
"The science-policy interface at the national level"
I start from a short insight into the channels of conversion of evidence, experience and wisdom accumulated in the academia for the use in policy at the inter-regional scale of the European Union. This interface is particularly important for shaping sustainable future of fragile, particularly sensitive sea areas with unusually complex dynamics and exceptional anthropogenic loads such as the Baltic Sea that are under jurisdiction of several countries.

The foundations of this kind of evidence flux for sustainable decision-making are (i) strong marine science, (ii) a powerful conversion mechanism of the new knowledge into substantiated arguments and scenarios, and (iii) an effective science-policy interface in single countries. Marine research in four universities of Estonia covers all basic fields of ocean science, from physical and biological oceanography to polar research and coastal engineering. A particular focus is on challenges associated with the design and verification of generic types of preventive methods for protection of marine and coastal environment.

To channel the output of this research to policy-making, we make use of favorable features of the small country and unique solutions that rely on high connectivity of society. Science-policy interface functions at various levels: institutional (e.g., science coordinators in ministries, the Foresight Centre at the parliament), formal ad hoc activities (working groups, consultations) and even more effectively via personal contacts of scientists with policy-makers and governmental officers. To ensure that the message from academia remains undistorted until the decision-making level, efforts are made towards bringing together leading scientists and policy-makers.

Ms. Monika Stankiewicz
Executive Secretary, Baltic Marine Environment Protection Commission – Helsinki Commission

Bio
Ms Stankiewicz has 20 years of international experience working on environmental issues and advancing the application of the ecosystem approach to the management of human activities. Since 2012, she is the Executive Secretary of the Baltic Marine Environment Protection Commission (HELCOM), an IGO consisting of the nine Baltic Sea countries plus the European Union. At HELCOM, she oversees large-scale expert processes to build strong scientific evidence on the status of and pressures to the marine environment using holistic and thematic environmental assessments, and supports national implementation processes and robust follow up on the agreed measures. She advises on the formulation of new policies and their links to global and European processes, and facilitates negotiations of the Contracting Parties to agree on common approaches and solutions.

She has extensive experience in engaging line ministries into environmental work, in the field of sustainable fisheries practices, sustainable agriculture, hazardous substances, protection of biodiversity, environmentally friendly shipping, and ecosystem-based maritime spatial planning. She successfully promoted the integration of economic and social components into regional marine environment assessments and planning of mitigation measures in the Baltic Sea.

Former Professional Secretary of HELCOM responsible for shipping and cooperation with the International Maritime Organization (2006-2011), she also worked in the environmental sector of the Polish public administration (1998-2006).

Ms Stankiewicz holds a Master of Science degree in Chemistry and the Certificate of Postgraduate Studies 'European Integration. EU Funds and Business Management in the European Single Market' from Gdansk University.

Abstract
"The science-policy interface at the regional level"
Within HELCOM – the Baltic Marine Environment Protection Commission, an intergovernmental organization working towards a healthy Baltic Sea – policy-science interactions are frequent, characterized by a bottom-up approach of science gathered by experts that ultimately feeds into policy and decision-making processes. One of the recent major results of policy-science cooperation in HELCOM is its second holistic assessment, giving a deep insight about the status of the marine environment as well as pressures and impacts from human activities affecting the sea. The results show that the Baltic Sea is not in a good state, mostly disturbed by pressures such as eutrophication, input of hazardous substances, overfishing or loss of seabed and habitats. Nevertheless, some trends such as the reduction of inputs of heavy metals or nutrients demonstrate that concerted regional policy action based on strong scientific underpinnings are bound to have positive results. Scientific information and data need to form the basis for policy-relevant and fit for purpose advice eventually leading to a Baltic Sea in good environmental status and more sustainable use of the marine resources. Policy makers like HELCOM also need to articulate their needs, to permit a more relevant response from science.

Ms. Juliette Babb-Riley
Deputy Permanent Representative of Barbados to the United Nations; Co-Chair, Ad Hoc Working Group of the Whole on the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects

Bio
Juliette Babb-Riley joined the Barbados Foreign Service in 1991 and has had an extensive career in the Foreign Service. She served as Head of the International Law, Human Rights and Maritime Delimitation Section from 2010 to 2012, and Head of the Human Rights and Multilateral Relations Section from 2012 to 2013.

In 2013, Ms. Babb-Riley was transferred to the Permanent Mission of Barbados to the United Nations as Deputy Permanent Representative. In 2016 she was appointed Co-chair of the Regular Process and serves as CARICOM Co-coordinator on BBNJ matters

Ms. Babb-Riley is the holder of a Bachelor of Arts degree in History and Political Science, a Bachelor of Laws degree and a Master of Science degree in International Studies.

Abstract
"Strengthening the science-policy interface at the global level"
One of the key roles of ocean science is to provide information to support the management and sustainable development of the ocean and its resources. For ocean science to better support decision-making, there is a need to enhance scientific understanding, improve long-term scientific assessments, strengthen capacities and create dialogues between scientists, policymakers and managers. The presentation will focus on the role of assessments, and integrated assessments in particular, in enhancing the science-policy interface. It will provide an overview of the various sectoral and thematic assessments that are conducted at the global level that relate to the ocean; underline the critical role of the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects, as the only UN General Assembly-led assessment process, its activities and the outputs produced under it. In that context, it will consider how the United Nations Decade of Ocean Science for Sustainable Development and the Regular Process can be mutually reinforcing and together work to strengthen the science-policy interface at the global level.