

OCEAN SCIENCE DAY

17 June 2015, Paris

PROGRAMME



one planet,
one ocean



United Nations
Educational, Scientific and
Cultural Organization



Intergovernmental
Oceanographic
Commission

The Intergovernmental Oceanographic Commission of UNESCO organizes for the first time an Ocean Science Day prior to a session of its Assembly, the governing body of the Commission. The Assembly sessions gather every two years IOC Member States (147 at this date) and partner organizations. The objective of the Ocean Science Day is to further increase the visibility and understanding of ocean science, current challenges and emerging issues.

The Ocean Science Day roots in the importance of the role of science and scientists for sustainable societies and in the need to inform and involve decision-makers in science. The event provides an opportunity to show the relevance of ocean science for the sustainability of our planet and to engage the decision-makers in discussions.

We believe this also offers a good opportunity for the marine scientific community to discuss on prospects on ocean science with colleagues and also with a wide representation of national stakeholders and Member States representations in UNESCO. The Ocean Science Day intends to focus on emerging issues that require international collaboration in marine science and technology. It also highlights the need to produce new ocean science and technologies for the benefit of society.

In consultations with the Officers of the Commission, this year's scientific programme is organized around four themes:

- *Oceans, Health and Wellbeing* (IOC Anton Bruun Memorial Lecture, 2015);
- *Glider challenge: High resolution for 4D oceanic measurements*;
- *International expeditions: From the Indian Ocean to the World Ocean and back in 50 years* (IOC N.K. Panikkar Memorial Lecture, 2015); and
- *The scientific challenges in the Arctic*

We would like to thank our speakers for their availability and enthusiasm and we hope that you will enjoy the lectures and the panels.

PROGRAMME

17 June 2015

Room II

10h00	Anton Bruun Memorial Lecture, 2015: <i>Oceans, Health and Wellbeing: the Next Frontier</i> Addressed by Prof. Lora E. Fleming (UK)
11h15	Panel 1: <i>Glider challenge: High resolution for 4D oceanic measurements</i> Moderator: Dr Scott Glenn (USA)
12h45	<i>Lunch break</i>
15h00	N.K. Panikkar Memorial Lecture, 2015: <i>From the Indian Ocean to the World Ocean and back in 50 years</i> Addressed by Dr John Field (South Africa)
16h15	Panel 2: <i>Challenges in the Arctic</i> Moderator: Dr Vladimir Ryabinin (IOC-UNESCO)
17h45	Closing remarks

Simultaneous interpretation will be provided in English, French, Spanish and Russian¹.

Questions can be sent by email before and during the event
only at the following temporary email address:

iococeanday2015@unesco.org

¹ Simultaneous interpretation is made available by courtesy of Norway.

Oceans, Health and Wellbeing: the Next Frontier

Addressed by Prof. Lora E. Fleming (U.K.)



Professor and Director
European Centre for Environment and Human Health
University of Exeter Medical School
UK

Professor Fleming is a health physician and epidemiologist with over 2 decades of experience and expertise in a wider range of environment and occupational exposures and human health. She is currently a Professor, Director of the European Centre of Environment and Human Health (www.ecehh.org), and Chair of Oceans, Epidemiology and Human Health at the University of Exeter Medical School (Truro, Cornwall, UK); and Professor Emerita in both the Miller School of Medicine and the Rosenstiel School of Marine and Atmospheric Sciences of the University of Miami (USA) where she was Co-Director of the NSF NIEHS Oceans and Human Health Centre.

Abstract:

In the European Union, 22 of 28 Member States have a coastline, and two thirds of European frontiers are coasts with approximately 218 million people (43%) living in coastal regions. The so called “EU Blue Economy” currently represents an estimated 5.4 million jobs and a gross added value of approximately €500 billion per year, with 75% EU external trade and 37% internal trade within the EU via the seas and oceans. There is growing evidence that the sustainability of ocean ecosystems and the health and wellbeing of humans are inextricably linked, and that how we interact with oceans and seas will significantly influence our future on Earth. Since the emergence of modern humans, the oceans have provided a source of culture, livelihood, expansion, trade, food and other resources. However, the rapidly increasing global population and the continuing alterations of the coastal environment are placing increasing pressure on coastal seas and oceans. Adverse human impacts (e.g. growing pollution) affect not only sustainability and quality of marine ecosystems, but also both directly and indirectly, human health. Yet, there is also enormous potential to promote human health and wellbeing through interactions with marine environments, as well as fostering pro-environmental behaviours promoting their restoration and preservation. The study of oceans and human health is inherently interdisciplinary, bringing together the medical, natural and social sciences, as well as diverse stakeholder communities (including fishers, recreational users, private enterprise, and policy makers). The history, policies, and known and potential risks and benefits of oceans and human health, provide insights into new areas and avenues of global cooperation with the potential for collaboratively addressing the local and global challenges of our interactions with the oceans, both now and in the future.

IOC N.K. Panikkar Memorial Lecture, 2015

From the Indian Ocean to the World Ocean and back in 50 years

Addressed by Dr John Field (South Africa)



Marine Research Institute
University of Cape Town
Rondebosch 7701
South Africa

Dr John Field is Emeritus Professor and Deputy Director of the Marine Research Institute at the University of Cape Town, where he studied and obtained his Ph.D. in quantitative marine ecology. He has served as President of the Scientific Committee on Oceanic Research (1996-2000), and chair of the Joint Global Ocean Flux Study (JGOFS) and deputy chair of GLOBEC. He has also served on the advisory committee to the minister responsible for fisheries management in South Africa. He is best known for his work with Richard Warwick and Bob Clarke on analysing ecological community patterns, the philosophy behind Plymouth Routines in Multivariate Ecological Research (PRIMER), and for his seminal paper on the “microbial loop” and the role of microbes in pelagic ecosystems.

Abstract:

This talk salutes the memory of Dr N.K. Panikkar who led the Indian programme of the International Indian Ocean Expedition (IIOE) and soon became Director of the then new National Institute of Oceanography in Goa in 1966. The talk outlines some personal memories, as a young graduate student, of Cruise 7 of RV *Anton Bruun* during the IIOE in 1964. Three months as part of the IIOE in the south west Indian Ocean changed the life of this graduate student, being introduced to several leading established scientists and some up and coming young ones, who passed on new ideas, techniques and enthusiasm. The instrumentation of the 1960s is described briefly and contrasted with the present technologies such as satellite remote sensing and other oceanographic revolutions of the late 20th century that allow us an instantaneous global view of the ocean’s surface. The turn of the century SCOR-IOC study to forecast Ocean Science in 2020 is revisited, and the potential for IIOE-2 is discussed in the light of new technology, bearing in mind some of the geo-political constraints that apply.

PANEL 1

Glider challenge: High resolution for 4D oceanic measurements

Moderator Dr Scott Glenn (USA)

Speakers:

- Dr Pierre Testor (France)
- Prof. Joaquín Tintoré (Spain)
- Prof. Karen Heywood (UK)
- Prof. Dr. Alexander Proelß (Germany)

Rationale:

Present and future generations will be challenged by the impacts of climate change, including melting ice and rising sea levels, ocean acidification and deoxygenation, and increasing extreme weather. This will be combined with the challenges of food and water security as global populations continue to grow and living marine resources are increasingly depleted. An improved multi-disciplinary understanding of the global ocean and its many large marine ecosystems, combined with the ability to observe their present and forecast their future state, is central to providing human society with mitigation and adaptation strategies. A growing constellation of ocean-viewing satellites, and the evolving suite of climate, global and regional scale ocean models, are key advances. Despite the international success of the Argo program, physical, biological and chemical Ocean profiles are still among the most sought after datasets for subsurface ocean, typically requiring expensive ship time countries can no longer afford. Long-duration autonomous underwater gliders, combined with compact sensors on marine mammals, reptiles and fish, can augment the Argo program with additional valuable data to enable discovery, promote scientific understanding, and ultimately improve our ability to forecast the ocean.

In this session we focus on the rapid development of autonomous underwater gliders as a critical component of the global observing network. Panellists will present their discovery experiences enabled by ocean gliders as well as describe their individual expertise with building global partnerships, integration of glider data in multi-platform observing and forecast systems, and the use of gliders in remote and extreme environments. Issues of international law will be considered. The panel will then discuss the growing needs, the barriers to implementation, and a positive vision of a collaborative international future.

PANEL 2

Challenges in the Arctic

Moderator Dr Vladimir Ryabinin (IOC-UNESCO)

Speakers:

- Dr Erik Buch (Denmark)
- Dr Jenny Baeseman (Norway)
- Dr Volker Rachold (Germany)

Rationale:

The rapid transformations occurring in the Arctic are affecting the entire Earth system, including its climate and weather extremes, through increased temperatures and the continuing loss of ice, glaciers, snow and permafrost. New economic interests in the Arctic have established the region as a larger player in the global economy, but also with very significant local effects. In spite of rapid environmental and social change, the Arctic remains a region of geopolitical stability which is a pre-condition for sustaining Arctic research. Changes in the Arctic are challenging our understanding of their consequences and our ability to provide knowledge for decision-makers. It is critical to anticipate changes in the Arctic rather than respond to them, but to do this requires sustained observations and improved understanding of local, regional and global processes. These research challenges must be addressed in a coordinated and timely manner to ensure sustainable development and resilient Arctic communities and ecosystems. Understanding the vulnerability and resilience of Arctic environments and societies requires increased international scientific cooperation, including contributions from non-Arctic states.

In this session we want to create greater sense of urgency among decision-makers and awareness regarding the global importance of changes taking place in the Arctic and how these have to be addressed. Panellists will present their views on the science needed to provide to science based knowledge for decision-makers and issues of international law will be also considered.

SPEAKERS



Dr Scott Glenn
Center for Ocean Observing Leadership
Department of Marine and Coastal Sciences
Institute of Earth, Ocean and Atmospheric Sciences
School of Environmental and Biological Sciences
Rutgers University (USA)

Dr Scott Glenn is a Distinguished Professor of Marine and Coastal Sciences at Rutgers University. He has over 35 year experience in ocean science research and education that includes the development of new ocean observation technologies and improved forecast models. He has been the Principal or Co-Principal Investigator on over \$100 million in grants, and is a co-author on over 160 publications. He is currently the PI on several ocean observing programs for the U.S. NSF and NOAA, led the first international mission to navigate an underwater glider across an ocean basin, and serves as the chair for the U.S. Committee for the IOC. In the only U.S. national program to recognize excellence in undergraduate teaching, Dr Glenn was named one of the U.S. Professors of the Year representing the State of New Jersey.



Dr Pierre Testor
Laboratoire d'Océanographie et de Climatologie
Expérimentations et Approches Numériques
Université Pierre & Marie Curie
Paris (France)

Pierre Testor is scientist in physical oceanography in relation with mesoscale/submesoscale processes. He is concerned with ocean and climate variability with emphasis on observations of ocean circulation and mixing using modern robotic platforms, and gliders in particular. In 2004, he deployed a glider for the first time in Europe in the framework of the EC MFSTEP (Mediterranean Forecasting System Towards Environmental Prediction) project. Since then, he participated to the development of the glider scientific and technological activity at the international level, within the EGO (Everyone's Gliding Observatories) group he set up. He wrote a Community White Paper on gliders at the OceanObs'09 conference, was the Chair of the EGO COST Action ES0904 (18 countries around the world) and coordinated the EC GROOM (Gliders for Research Ocean Observation and Management) project, a design study for a EU Research Infrastructure dedicated to gliders.



Prof. Joaquin Tintore
Mediterranean Institute for Advanced Studies
Director Balearic Island Observing and Forecasting System
Palma de Mallorca
Spain

Joaquín Tintoré is Professor of Physical Oceanography from CSIC (Spanish Research Council) at IMEDEA (9/2000) and since 12/2008, Director of the Spanish Large Scale Marine Infrastructure SOCIB (Balearic Islands Coastal Ocean Observing and Forecasting System), a new multi-platform observing system that responds to scientific, technological and strategic society priorities related to the role of the oceans and the coasts in a global change framework. SOCIB responds to a paradigm change in ocean and coastal observation, advancing towards quasi-real time multi-platform systems. Since 2013, SOCIB is providing streams of data, tools, products and modelling services for science and society, a clear performance indicator of SOCIB achievements. He has published 162 papers in international refereed journals, has been principal investigator in 49 peer reviewed research projects, many of them EU funded projects -since 1990-, coordinating two of them. He also has extensive experience in Management of Science with positions, in particular related to Research Infrastructures since 2010. He has also performed advisory and evaluation activities for the European Commission, the industry and other national and international entities as well.



Prof. Karen Heywood
Centre for Ocean and Atmospheric Sciences
School of Environmental Sciences
University of East Anglia
UK

Karen Heywood is a Professor of Physical Oceanography at the Centre for Ocean and Atmospheric Sciences at the University of East Anglia. She has been at UEA as a lecturer and researcher since 1989. Originally a physicist, she enjoys furthering our understanding of ocean processes and the ocean's role in climate. She is primarily an observational oceanographer and has led major research cruises to the Southern Ocean including some of the WOCE sections. She has published over 100 research papers and supervised more than 25 PhD students. She was Chair of UK SCOR, and is active on international committees including SCOR, SOOS and most recently the IPC of IIOE-2. She currently leads the UEA Seaglider group and is a trained ocean glider pilot. She has led glider deployments from the Antarctic to the tropical Indian Ocean via the North Sea. She enjoys multidisciplinary research and nurturing the careers of early career scientists.



Prof. Alexander Proelß
Director of Institute of Environmental and Technology Law
Vice-Dean Department of Law
Trier University
Germany

Alexander Proelß is professor for public law, in particular public international law and European law, at Trier University, Germany. He is the Vice-Dean of the Department of Law, Director of the Institute of Environmental and Technology Law, and a member of the board of directors of the Centre for European Studies of that University. Until his move to Trier University in October 2010, he taught international and European law as one of the directors of the Walter-Schücking Institute for International Law at the Christian Albrechts University at Kiel, Germany. International and European environmental law as well as the international law of the sea constitute the focal points of his research. Alexander Proelß is a member of several national and international research consortia.



Dr Vladimir Ryabinin
Executive Secretary
IOC-UNESCO
Paris
France

Dr Vladimir Ryabinin (Russian Federation) is the holder of a Senior Doctorate in Physical and Mathematical Sciences (Oceanography and Geophysics) from the Supreme Attestation Committee of the Russian Federation in Moscow, obtained in April 1995, and has professional certifications as an Engineer-Oceanographer from the Leningrad Hydrometeorological Institute (June 1978). Mr Ryabinin was one of the creators of the first Soviet technology for numerical weather prediction for medium ranges (up to a week) implemented in the mid-1980s. From 1989-1993, he developed a spectral model for the prediction of wind waves on the ocean surface. From July 1996 to September 1998, Mr Ryabinin was the Head of the Laboratory for Marine Forecasting Research and Coordinator of national research on marine forecasting. During this period, he was one of the main developers of the Federal Program "World Ocean". Since November 2001, Mr Ryabinin is a Senior Scientific Officer (P-5 level) in the World Climate Research Programme (WCRP) and a staff member of the World Meteorological Organization (WMO, Geneva, Switzerland), where he was responsible for the international coordination of climate research with a focus on the polar regions and cryosphere, oceans, sea level, stratosphere, atmospheric chemistry and climate, and contribution of research into the creation of climate services. In March 2015 Dr Vladimir Ryabinin was appointed to the post of Executive Secretary of the Intergovernmental Oceanographic Commission (IOC), at the level of Assistant Director-General (ADG).



Dr Volker Rachold
Executive Secretary
International Arctic Science Committee (IASC)
Stockholm
Sweden

Dr Volker Rachold is the Executive Secretary of the International Arctic Science Committee (IASC). His functions include guiding and overseeing IASC's activities, representing the organization on various international committees and at international meetings, facilitating the planning and organization of the Arctic Science Summit Week (ASSW) and other international conferences, directing IASC's communications and managing the IASC Secretariat. Dr. Rachold graduated as a geochemist from Göttingen University, where he also obtained his Ph.D. in 1994. Before moving to the IASC Secretariat in Stockholm in 2006 and in Potsdam from 2009, he worked with the Alfred Wegener Institute for Polar and Marine Research. His research focused on land-ocean interactions in the Siberian Arctic and he led several land- and ship-based Russian-German expeditions. He is author and editor of numerous scientific papers and serves as a reviewer for scientific journals and funding agencies.



Dr Erik Buch
Chairman
EuroGOOS
Brussels
Belgium

Dr Erik Buch, EuroGOOS chair. Master of Science, Physical Oceanography, 1978; Ph.D. in Physical Oceanography, 1983; Bachelor of Commerce, Management, 1990 and Project Management, 1994. Senior scientist at Greenland Fisheries Research Institute, 1982; Head of Fisheries Department, same institute, 1985. Vice-Director, same institute, 1986. Head of Oceanographic Department, Royal Danish Administration of Navigation and Hydrography, 1990. Director of Division for Operational Oceanography, DMI 1998 (renamed to Centre for Ocean and Ice in 2006). Danish representative in EuroGOOS since 1995. Member of EuroGOOS Board 1999-2003 and since 2008; chair since 2013. Chairman of EuroGOOS Baltic Task Team (BOOS) 1998-2009. Danish IOC delegate 2007-2013. Initiator, coordinator or WP-leader of a number of research projects with relation to marine climate and operational oceanography. Dr Buch has considerable experience in oceanographic data collection, analysis and presentation.



Dr Jenny Baeseman
Director
Cryosphere and Climate Project (CliC)
University of Tromsø
Norway

Dr Baeseman began her love of the cold growing up on a dairy farm in Wisconsin, USA and has a B.S. in Water Chemistry from the University of WI - Stevens Point, M.S. in Civil Engineering from the University of Minnesota, a Ph.D. also in Civil Engineering with an environmental emphasis from the University of Colorado, and postdoctoral training in Geosciences from Princeton University. She has spent 4 seasons in Antarctica, 3 in the McMurdo Dry Valleys and 1 on the peninsula. Jenny was very involved in the planning of the International Polar Year (IPY) and through this co-founded and subsequently became the Founding Director of the Association of Polar Early Career Scientists (APECS) which grew to over 3500 members from 76 countries during her leadership. One of her main objectives in developing APECS was to help young researchers combine their interests in interdisciplinary polar science with education and outreach and gain international leadership through professional development activities. In April 2012 she turned over the reigns of the early career group to become the Director of the Climate and the Cryosphere Project (CliC), sponsored by the World Climate Research Programme, the Scientific Committee on Antarctic Research and the International Arctic Science Committee. The CliC Project office is hosted by the Norwegian Polar Institute in Tromsø, Norway. She continues research in her spare time through an adjunct position at the International Arctic Research Center (IARC) at the University of Alaska – Fairbanks. One of Jenny's personal goals is to make sure everyone she meets knows that polar bears don't eat penguins - as they live at different Poles.

NOTES

The IOC Anton Bruun Memorial lecture Series is dedicated to the memory of the noted Danish oceanographer and first chairman of the Commission, Dr Anton Frederick Bruun. The “Anton Bruun Memorial Lectures” were established in accordance with Resolution 19 of the Sixth Session of the IOC Assembly in 1970, in which the Commission proposed that important inter-session developments be summarized by speakers in the fields of solid earth studies, physical and chemical oceanography and meteorology, and marine biology.



Anton Frederick BRUUN was born on the 14th of December 1901 as the oldest son of a farmer, but a severe attack of polio in his childhood led him to follow an academic, rather than agrarian, career. In 1926 Bruun received a Ph.D. in zoology, having several years earlier already started working for the Danish Fishery Research Institute. This association took him on cruises in the North Atlantic where he learned from such distinguished scientists as Johannes Schmidt, C.G. Johannes Petersen and Thomas Mortensen.

Of even more importance to his later activities was his participation in the *Dana* Expedition's circumnavigation of the world in 1928-1930, during which time he acquired further knowledge of marine animal life of the sea, general oceanography and techniques in oceanic research. In the following years Bruun devoted most of his time to study the rich *Dana* collections and to the publication of his treatise on the flying fishes of the Atlantic. In 1938 he was named curator at the Zoological Museum of the University of Copenhagen and later also acted as lecturer in oceanology.

From 1945-1946 he was the leader of the *Atlantide* Expedition to the shelf areas of West Africa. This was followed by his eminent leadership of the *Galathea* Expedition in 1950-1952, which concentrated on the benthic fauna below 3,000 m and undertook the first exploration of the deep-sea trenches, revealing a special fauna to which he gave the name “hadal”.

The last decade of Bruun's life was devoted to international oceanography. He was actively involved in the establishment of bodies like SCOR, IACOMS, IABO, and the IOC and was elected IOC's first chairman in 1961. His untimely death a few months later, on 13 December 1961, put an end to many hopes and aspirations.

In 1962, the former US Presidential yacht *Williamsburg* was converted into a research vessel and renamed Anton Bruun in honour of the great scientist. The *Anton Bruun* took part in the International Indian Ocean Expedition (1959-1965) and, in the late 1960s, circumnavigated the globe in one of the last great exploratory expeditions of modern oceanography.

In 2004, an ‘Anton Bruun Medal’ was created by the IOC to formally honour Bruun's role in international oceanography. The medal was awarded for the first time to Mr Donald Anderson who delivered the IOC A. Bruun Memorial Lecture on the occasion of the 23rd Assembly in 2005 (see <http://unesdoc.unesco.org/images/0016/001631/163114e.pdf>).

The IOC N.K. Panikkar Memorial Lecture Series is dedicated to the memory of the noted Indian marine biologist and past chairman of the Commission, Dr Nedumangattu Kesava Panikkar. The IOC N.K. Panikkar Memorial Lecture was established at the 18th Session of the Assembly (1995) to address capacity building in marine science issues at regional and/or national levels. This proposal was very much that of the Group of Experts of IOC Committee for Training, Education and Mutual Assistance in the Marine Sciences (TEMA) at the time.



Dr Nedumangattu Kesava Panikkar (1913-1977) was born on 17 May. His outstanding research earned him D.Sc. from the University of Madras at the age of 25. He was invited as an overseas scholar, for a four-year period, by the Royal Commission to work at the Universities of London and Cambridge, on osmoregulation in prawns.

On his return, he joined as a Professor of University College, Trivandrum and later moved to Zoological Laboratory, University of Madras as the Director. Recognizing his valuable contributions, the Ministry of Food and Agriculture in 1946 made him an Officer on Special Duty to steer fisheries research in India. He established the Central Inland Fisheries Research Institute and the Central Marine Fisheries Research Institute. He also initiated the Central Institute of Fisheries Technology, the Central Institute of Fisheries Education and the Central Institute of Fisheries Operatives. In 1962 he took charge as the Director, Indian Programme of the International Indian Ocean Expedition (IIOE). His efforts led to organizing 22 cruises on board *INS Kistna* and to the collection of large volumes of data. He later became the Founder Director of National Institute of Oceanography, Goa. After his superannuation at NIO, Goa, he became the First Vice-Chancellor of the University of Cochin: Chairman, Science and Technology, Kerala Government and Member, Kerala State Planning Board.

Dr Panikkar was honoured by national and international bodies. He was elected as Fellow of the Indian Academy of Sciences (1943), Zoological Society of India, Royal Society of Arts (London, 1950), Indian National Science Academy (1952) and Indian Geophysical Union, Member Secretary of the National Commission on Agriculture and Life Member of the Marine Biological Association of India. Dr Panikkar was a recipient of several awards that included the Galathea Medal of Denmark (1953), Sir Dorahji Tata Medal (1961–1963) of Zoological Society of India, Chandrakala Hors Medal (1971) and Padma Shri (1973).

Dr Panikkar had several publications to his credit in diversified national and international journals that range from the Journal of Bombay Natural History Society to Nature. Dr Panikkar has also edited a series of Zooplankton Atlases. Through his pioneering works on several marine scientific aspects he remains even today a source of inspiration to scientists in his country.

Dr Panikkar was elected Chairman of IOC in June 1964 at the Third Session of the Assembly. Dr Panikkar also served as chair of the Working Group on Mutual Assistance convened at the Sixth Session of the Assembly in 1969.

In 2009, a 'N.K. Panikkar Memorial Medal' was created by the IOC to formally honour its past Chairman and all IOC N.K. Panikkar lecturers on capacity building in marine science issues at regional and/or national levels. The medal was awarded for the first time to Prof. Ittekkot, Director at the Leibniz Centre for Tropical Marine Ecology, Bremen, Germany, in 2009.