



# CIESM

The Mediterranean Science Commission - [www.ciesm.org](http://www.ciesm.org)

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## Research benefits for whom ?

**CIESM - The Mediterranean Science Commission**  
- paves the way for sharing benefits arising from the ocean,  
with its charter on access and benefit-sharing for blue  
biotechnology development and against biopiracy.







## OSD 02. The Ocean Sampling Day

## The CIESM Charter 04.

## CIESM 06. The Mediterranean Science Commission

## Micro B3 08. on Marine Microbial Biodiversity, Bioinformatics and Biotechnology

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**CIESM - The Mediterranean Science Commission**  
16, bd de Suisse - 98000 MONACO  
Tél. +377 93 30 38 79 - [contact@ciesm.org](mailto:contact@ciesm.org)  
[www.ciesm.org](http://www.ciesm.org)

# Edito



« Née au début du siècle, la Commission Internationale pour l'Exploration Scientifique de la mer Méditerranée joue un rôle qui va au-delà du simple appui à la recherche. Aujourd'hui, ses expertises et ses recommandations sont devenues particulièrement recherchées comme outils d'aide à la décision par les responsables nationaux et internationaux.

L'influence de la CIESM doit beaucoup à sa composition : 23 Etats Membres qui couvrent l'essentiel du pourtour méditerranéen et de la mer Noire. La Commission peut ainsi défendre les intérêts de la région avec force et impartialité. A l'heure où le dialogue entre les peuples du Bassin est tendu ici, là inexistant, ses relations multilatérales patiemment tissées depuis 1919 s'avèrent précieuses.

Autre atout, un réseau pluridisciplinaire d'instituts et de chercheurs qui ont accès aux hautes technologies et aux instruments d'exploration océanographique les plus performants. Ce potentiel lui permet de lancer rapidement des initiatives sur des sujets sensibles, mobilisant des scientifiques d'horizons complémentaires.

Alors que la pression anthropique exercée sur l'environnement méditerranéen ne cesse de croître, la mission de la CIESM - engager la science la plus moderne au service des nations et des institutions œuvrant pour le développement et la protection durables - n'a jamais paru aussi importante.

*"The Mediterranean Science Commission was created at the beginning of the 20<sup>th</sup> Century and has played ever since a key role that today goes far beyond supporting marine research in this sensitive, heavily impacted region. Today, its broad international expertise and science-based recommendations are awaited as support to decisions by national and international policy-makers.*

*The Commission is able to defend research and environmental priorities with scientific impartiality, strengthened by the joint political support of its 23 Member Governments that cover the whole Mediterranean and Black Seas. At a time when dialogue is not easy or non-existent in the Region, the trustful multilateral relations patiently built by CIESM since 1919 are unique and precious.*

*The Commission covers a broad spectrum of marine disciplines, based on a pool of vast human resources, research institutes and advanced oceanographic technological platforms. This complex web of expertise, coming from different horizons, is able to respond to critical issues and initiate new programmes when urgently required.*

*While the impact of the anthropic pressures on the Mediterranean environment is fast growing, CIESM's mission -to engage the latest science for the sustainable and durable development of nations and institutions - has never been as important as today.*

**Prof. Frédéric Briand**  
Director General,  
Mediterranean Science Commission (CIESM)







# OSD

Ocean Sampling Day

## Une journée mondiale pour décrypter la biodiversité marine A Worldwide Scientific Adventure for Marine Biodiversity

**Une nouvelle initiative scientifique, organisée le 21 juin, a pour objectif de séquencer les océans. Cet événement mondial, mis en place pour la première fois, permet d'étudier la biodiversité marine, découvrir de nouveaux microorganismes et de comprendre la complexité de l'écosystème marin grâce au séquençage des gènes et de tout le génome (appelé génomique) des microorganismes contenus dans l'eau de mer.**

*A worldwide initiative to sequence the Oceans for Marine Microbial Diversity takes place on 21<sup>st</sup> June. This event, performed for the first time, allows to study the biodiversity and ecosystem functioning in marine waters through genomics, the science of sequencing genes and understanding their meaning.*

Le 21 juin, plus de 160 équipes de recherche dans le monde entier (de l'Islande jusqu'en Antarctique, de l'Égypte jusqu'au Maroc via la Crète et l'Italie) échantillonnent et analysent de l'eau de mer pour identifier de nouveaux microorganismes. Les dernières avancées en Système d'Information permettent d'obtenir une grande quantité de données de séquences d'ADN de ces microorganismes et de les intégrer à des données environnementales.

*On 21<sup>st</sup> June, up to 160 science teams, all around the world (from Iceland to Antarctica and from Egypt to Morocco) are taking water samples from the oceans in order to identify the microbes in it. Advanced technologies are applied to obtain large amounts of sequence data, which will be integrated with environmental data into a new powerful Information System. This vast open-access data set will be valuable for advanced ecological knowledge, for comparisons of known and unknown genes and potential biotechnological applications with the discovery of new unknown genes. The outcome of this global effort will be nothing less than the biggest data set in marine research on genetic resources and envi-*



Cette vaste base de données, accessible à la communauté scientifique et à la société, permettra d'approfondir les connaissances en écologie marine, de découvrir de nouvelles espèces ou des gènes encore inconnus, avec de potentielles applications biotechnologiques, pour l'industrie cosmétique, pharmaceutique, ou encore alimentaire. Le résultat de cet effort mondial est l'obtention de la plus grande quantité de données jamais obtenues en une seule journée de recherche.

**L'OSD est organisé dans le contexte du projet MicroB3 financé par la Commission Européenne.**

[www.OceanSamplingDay.org](http://www.OceanSamplingDay.org)

En plus des avancées scientifiques, des questions liées à la propriété intellectuelle sont soulevées telles que « À qui appartiennent les microorganismes marins ? Qui a le droit d'accéder aux données, à la connaissance, aux échantillons marins, à l'ADN extrait ? » Pour tenter de répondre et de résoudre certains de ces points, de nouveaux contrats légaux sont mis à disposition des scientifiques participant à l'OSD.

*ronmental data that has ever been taken on one single day.*

*Because of unresolved intellectual property issues such as who owns the microbes and their genetic information as well as who obtains access to knowledge, data and to the genetic material, some novel legal and policy recommendations are developed and are tested for the first time.*

**OSD is organised under the umbrella of the European-funded project Micro B3.**

**OSD is coordinated by Prof. D. Field & Dr. M. Bica Oxford University**



• *"With more than 160 sampling sites worldwide, OSD has exceeded our wildest dreams. The resulting dataset marks the beginning of a new area of genome-enabled site-based marine research." Prof. F. O. Glöckner, Micro B3 coordinator & Chair of the CIESM committee on Marine Microbiology and Biotechnology.*

# The CIESM Charter

on Access and Benefit-Sharing of Marine Genetic Resources

for sharing the benefits arising from the oceans

A Charter for blue biotechnology development and against biopiracy

Les Ressources Génétiques Marines ont le potentiel de fournir de manière durable des opportunités commerciales considérables pour les économies locales à travers le développement d'un large éventail d'applications au niveau alimentaire, pharmaceutique, cosmétique, industriel.

Dans ce contexte, l'accès et le partage équitable des avantages découlant de l'exploitation (à des fins commerciales ou de recherche) des Ressources Génétiques Marines restent encore un problème non résolu.

Afin de faciliter le dialogue entre les parties prenantes (gouvernements, industrie, recherche), la CIESM a rédigé une Charte qui s'applique aux acteurs engagés dans la collecte et l'exploitation des ressources génétiques marines. Elle est construite sur neuf principes fondamentaux afin de favoriser le développement de la recherche maritime, tout en limitant les abus. Ce dispositif « éthique » est mis en place dans le cadre de campagnes d'échantillonnage et en particulier dans le cadre de l'initiative « Ocean Sampling Day ».

*With the great diversity of Marine Genetic Resources (MGRs), sampled and analysed for basic research or commercial applications, the potential to sustainably deliver considerable wealth and business opportunities to local economies through the development of a wide array of applications in food, pharmaceuticals, cosmetics, is well known. It also raises the question of «Research Benefits for Whom?».*

*The CIESM Charter on Access and Benefit-Sharing arising from the utilization of Marine Genetic Resources is conceived to stimulate research and development and provides ethical guidelines to providers, enquirers and end-users regarding this issue. It emphasizes essential core values, such as fair and equitable sharing of benefits, transparency, reciprocal relations. The CIESM Charter applies to parties engaging in the collection and exploitation of Marine Genetic Resources in the Mediterranean, emphasizing that the Region maintains and protects the access to knowledge to everyone and prevents abuses of the ocean global commons.*

*It is built upon 9 clear core values.*

*The CIESM Charter on Access and Benefit-Sharing of Marine Genetic Resources supports the exploration of marine ecosystems by promoting the sustainable use of MGRs without penalizing potential biotechnological (economic) development to boost marine research and innovation opportunities.*

1

**Equité et Impartialité**

**Equity and Fairness**

*Share fairly and equitably with the country providing access to its national water, any monetary or non-monetary benefits arising from the utilization of Marine Genetic Resources. Engage a re-negotiation process with the country if downstream commercialization is foreseen.*

2

**Compréhension des Droits de Propriétés Intellectuelles existants et octroyés**

**Certainty of Property Rights**

*IPRs assignments - Ensure with certainty the existing property rights and assign new one fairly and equitably.*

3

**Responsabilité et Légalité**

**Legality / Liability**

*Identify clearly regulations and laws governing access to and utilization of Marine Genetic Resources collected in the country providing access and comply with domestic and international laws and Access and Benefit-Sharing laws.*

4

**Transparence**

**Transparency**

*Communicate the objectives, any third parties and the proposed research that will be carried out to access and to utilize the Marine Genetic Resources.*

5

**Traçabilité**

**Traceability**

*Keep records of Marine Genetic Resources sampling and analysis processes, including repositories location (data and material) and any third parties involved.*

6

**Relations Réciproques**

**Reciprocal Relations**

*Cooperate with and involve scientific communities from the country providing access in all aspects of research projects in a mutual relationship; identify and discuss together the best way to share non-monetary or monetary benefits, exchange on mutual benefits.*

7

**Partage des Données Concerted Handling of Commons**

*Ensure that the contributors share responsibilities for data preservation, delivery and management. Any information handled by one party should be shared with the other so as to facilitate the mutual exchange for Marine Genetic Resources access and analysis.*

8

**Préservation de la Nature et Respect de l'Environnement**

**Nature Conservation and Environmental Respect**

*Ensure that the sampling sites are not damaged and conservation of marine biodiversity is not impeded by the research.*

9

**Efficacité**

**Efficiency**

*Ensure Transaction cost are minimized in governance structures.*





# CIESM



The Mediterranean Science Commission

Une organisation intergouvernementale de 23 Pays Membres  
An intergovernmental Organisation supported by 23 Members States

La CIESM soutient la recherche multilatérale en Méditerranée et en mer Noire depuis 1910, date de sa conception. Couvrant une région déchirée depuis trop longtemps par des conflits historiques, la CIESM représente un forum unique pour l'échange scientifique et le dialogue, réunissant des milliers de chercheurs qui, ensemble, utilisent les technologies et approches les plus récentes pour comprendre, surveiller et protéger une mer très exposée. La Commission est ainsi en mesure de défendre les priorités du Bassin en matière de recherche marine et environnementale avec la plus grande impartialité, renforcée par l'appui politique de ses 23 Pays Membres.

*CIESM was founded in 1910 to federate marine research and explorations across the Mediterranean and Black Sea. Today the Commission manages international scientific Workshops, congresses, monitoring programs, data bases, and provides independent advice to its Member States. Covering a region too often divided by ancient conflicts, CIESM offers a unique forum for scientific exchange and dialogue, bringing together several thousands of researchers from all shores of the Basin who apply the latest scientific tools to understand, monitor and protect a fast-changing, highly impacted sea. The Commission is thus able to defend research and environmental priorities with scientific impartiality, strengthened by the combined political support of its 23 Member Governments.*

## Un réseau d'expertises uniques :

- + Plus de 5 000 chercheurs marins
- + Plus de 500 instituts de recherche affiliés

La Commission couvre un champ étendu de disciplines marines grâce à ses vastes ressources humaines: plus de 5 000 chercheurs marins basés dans quelques 500 instituts de recherche situés dans une cinquantaine de pays (y compris outre Atlantique).

Cette expertise exceptionnelle est structurée en six comités – Géosciences Marines, Physique et Climat des Océans, Bio-géochimie Marine, Microbiologie et Biotechnologie Marines, Ressources Vivantes, Écosystèmes Marins, Écosystèmes Côtiers – qui coiffent de vastes domaines de recherche et présentent leurs dernières découvertes durant les Congrès triennaux de la CIESM.

La Commission est en mesure de délivrer le meilleur avis scientifique possible aux agences nationales et internationales sur la base de ses ateliers de recherche, une activité initiée en 1997 qui est devenue en quelques années l'une des marques de fabrique de la CIESM. Des sujets sensibles, émergents, allant du contrôle de l'érosion côtière au rôle des virus marins, sont traités par les meilleurs experts lors de ces séminaires dont les monographies sont disponibles sous forme imprimée et sur support digital.

Intégrant les dernières connaissances scientifiques, ces rapports synthétisent les conclusions de collectifs de chercheurs, soulignant les acquis récents et les questions prioritaires. Avec plus de 40 volumes publiés, la collection CIESM Workshop Monographs constitue un corpus inégalé de connaissances sur les sciences marines en Méditerranée. Leur succès reflète l'importance de la mer Méditerranée comme microcosme pour l'étude des processus et des changements à l'œuvre dans les océans.

*The Commission covers a broad spectrum of marine disciplines. To do so, it relies on a pool of vast human resources: over 5,000 marine scientists from some 500 research institutes located in more than 30 countries. This complex web of expertise is structured into six committees which oversee vast domains of research and present significant discoveries through research workshops and tri-annual CIESM congresses.*

*CIESM draws on leading scientists to deliver impartial and authoritative advice to national and international agencies, to the research community and to the public at large. This is largely achieved through research workshops which have become a CIESM trademark. Key issues covering a diversity of marine disciplines, from the control of coastal erosion to the role of marine viruses, are discussed by key experts during these high-level, intensive "think thanks". Their success reflects the importance of the Mediterranean Sea as a microcosm to understand marine processes and trends in the World Ocean.*

*The Commission keeps a scientific watch over the Mediterranean Sea, in particular over blue biotechnology and pays attention to critical issues related to the exploitation of marine resources in the Mediterranean Sea, with emphasis on legal (International Property Rights) and Policy (Capacity building) issues with the aim to fill gaps, and enhance cooperation on this emerging topic across the Basin.*



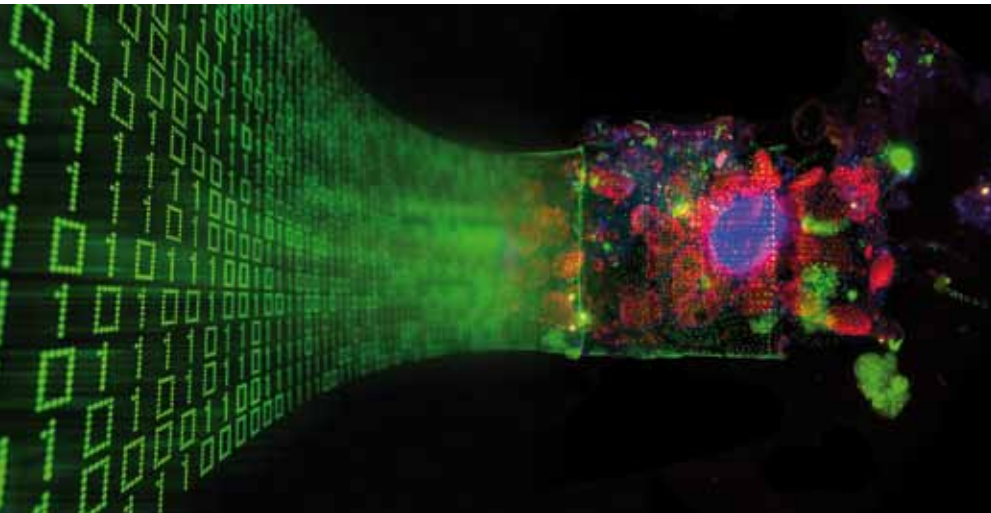
More info at :  
[www.ciesm.org](http://www.ciesm.org)





# Micro B3

Marine Microbial Biodiversity,  
Bioinformatics and Biotechnology



**Micro B3 is coordinated by Prof. Frank Oliver Glöckner,** Jacobs University and Chair of the CIESM Committee on Marine Microbiology and Biotechnology

Micro B3 is funded by the European Commission

**More information at:**  
<http://www.microb3.eu/>

With technological advances in the fields of 'Omics analyses, oceanography and lab automation, marine scientists conduct projects they only dreamed of 10 years ago. The deluge of data produced is beyond the skill-set of many marine scientists and very little data management infrastructure exists. Micro B3 (Biodiversity, Bioinformatics and Biotechnology) facilitates the whole process from sampling and data acquisition to analysis and interpretation. It leads to better understanding of marine ecosystems and paves the way for novel biotechnological applications.

Nine interdisciplinary teams of experts in bioinformatics, computer science, biology, ecology, oceanography, bio-prospecting, biotechnology, ethics and law are working together: 32 research institutes and companies coordinated from Jacobs University Bremen, Germany. The objective of the project funded by the European Commission is to integrate biodiversity, genomic, and oceanographic databases into one Informa-

tion System (IS) to determine functions of still unknown genes found in marine microbes. One is using co-occurrence networks for determining hypothetical functions of unknown genes from marine microbes. Results from genome mining for anti-tumour compounds, enzyme databases, libraries and new expression systems for experimental screening are becoming available

The innovative Micro B3-IS allows for seamless processing, integration, visualisation and accessibility of the huge amounts of marine data collected in ongoing biodiversity sampling campaigns and long-term observations. This provides new perspectives for the modelling and exploration of marine microbial communities.

**This is a new communication culture crossing traditional boundaries: Micro B3 integrates expertise from sampling to supporting storage, analysis and downstream use of resulting environmental and bioinformatics data to create long-lasting and interoperable structures and resources for data mining. Expected impacts include a better understanding of marine microbial ecosystems in terms of their complexity and the parameters driving their functions. The novel bioinformatics tools are having wide-ranging impacts, for example providing information for the cost- and time-efficient generation of new targets for biotechnological applications.**

## Briefly



## MyOSD

### An application developed for citizen science

The citizen science initiative, MyOSD launched with the OSD, allows civil volunteers to participate by collecting during a field trip environmental data: latitude, longitude, temperature, wind speed but also pH, salinity, phosphate concentration, and more. MyOSD App allows to upload the scientific measurements and provide the data to support the scientists to get a better understanding of the world's oceans. With OSD a huge snapshot of the world's oceans (high spatial resolution) in a very narrow time window is taken as a high-resolution picture, capturing all information in one instant. All environmental data will be publicly available

#### To participate

<http://www.microb3.eu/myosd>  
and more at <https://www.youtube.com/watch?v=N34Tpr68qHK>

#### To spread the word:

Follow MyOSD on Twitter or on Facebook:  
<https://www.facebook.com/microb3osd>  
[https://twitter.com/Micro\\_B3](https://twitter.com/Micro_B3)  
The official Hashtag is #osd2014

# Scientists participating to the OSD event and endorsing\* the CIESM Charter on Access and Benefit-Sharing

\*As of 16 June 2014

## **Leopoldina**

**Aguirre-Macedo Ma.**  
CINVESTAV-IPN Unidad Mérida  
Mexico

## **Cecilia Alonso**

Centro Univ. de la Región Este  
Uruguay

## **Linda Amaral Zettler**

Marine Biological Laboratory  
USA

## **Ariel Asaf**

Ecocean  
Israel

## **Federico Baltar**

University of Otago  
New Zealand

## **Said Barrijal**

Faculty of Science and  
Technologies  
Morocco

## **Mesude Bicak**

University of Oxford  
UK

## **Oleksandra Bobrova**

Odessa National I.I.  
Mechnikov University  
Ukraine

## **Noureddine Boukhatem**

Université Mohammed Premier  
Morocco

## **Arianna Broggiato**

Université Catholique de Louvain  
Belgium

## **Çiçek Burak Ali**

Eastern Mediterranean Univ.,  
Underwater Res. & Imaging Center  
North Cyprus

## **Ibon Cancio**

Plentzia Marine Station University  
of the Basque Country  
Spain

## **Chris Bowler**

CNRS  
France

## **Melody Clark**

British Antarctic Survey  
UK

## **Simon Claus**

Flanders Marine Institute  
Belgium

## **Eric Collins**

University of Alaska Fairbanks  
USA

## **Rodrigo Costa**

Centre of Marine Sciences  
Portugal

## **Dr Mark J. Costello**

University of Auckland  
New Zealand

## **Neil Davies**

Gump Station UC Berkeley  
Moorea French Polynesia

## **Neils Davies**

Gump Station UC Berkeley Moorea  
French Polynesia

## **Tom Dedeurwaerdere**

Université Catholique de Louvain  
Belgium

## **Paola Del Negro**

OGS  
Italy

## **Bernardo Duarte**

MARE - Centre for Marine  
and Environmental Sciences  
Portugal

## **Monia El Bour**

Institut National des Sciences  
et Technologies de la Mer  
Tunisia

## **Dawn Field**

University of Oxford  
UK

## **Marc Frischer**

University of Georgia Skidaway  
Institute of Oceanography  
USA

## **Jed Fuhrman**

University of Southern California  
USA

## **Hassan Ghazal**

Polydisciplinary Faculty of Nador  
Morocco

## **Lunia Gian Marco**

National Research Council  
Institute of Marine Science  
Italy

## **Plinio Gondola**

Smithsonian Tropical Research  
Institute  
Panama

## **Nigel Grimsley**

CNRS  
France

## **Stephen Jackson**

Marine Biotechnology Centre  
University College Cork  
Ireland

## **Christian Jeanthon**

Station Biologique de Roscoff,  
CNRS  
France

## **C. Leong Jo-Ann**

Hawaii Institute of Marine Biology  
Hawaii

## **Scott Jones**

Smithsonian Institution  
USA

## **Mahrous Kandil**

University of Alexandria  
Egypt

## **Georgios Kotoulas**

Hellenic Centre for Marine  
Research  
Greece

## **Federico Lauro**

Singapore Centre on Environ-  
mental Life Sciences Engineering  
Singapore

## **Dominique Lefevre**

CNRS AMU – MOI  
France

## **Bodrossy Levente**

CSIRO  
Australia

## **Carolin Löscher**

Kiel University, Helmholtzcenter  
for ocean research GEOMAR  
Germany

## **Catarina Magalhães**

CIIMAR - Interdisciplinary Centre  
of Marine and Environ. Res.  
Portugal

## **Viggó Marteinsson**

MATIS  
Iceland

## **Ana Martins**

University of the Azores  
Portugal

## **Fergal O'Gara**

Biomerit Res. Centre Univ. Cork  
Ireland

## **Sandi Orlic**

Ruder Boskovic Institute  
Croatia

## **Lise Øvreås**

University of Bergen  
Norway

## **Maria Luiza Pedrotti**

Observatoire Océanologique  
de Villefranche/ Mer  
France

## **Antonella Penna**

University of Urbino  
Italy

## **Sophie Pitois**

CEFAS – Centre for Env't, fisheries  
& aquac. science  
UK

## **Alejandra Prieto-Davó**

UNAM  
Mexico

## **Eyal Rahav**

Israel Oceanographic and  
Limnological Research  
Israel

## **Alejandra Ramos**

CINVESTAV-IPN  
Mexico

## **Sandra Ramos**

CIIMAR- Interdisciplinary Centre  
of Marine and Environ. Res.  
Portugal

## **Richmond Robert H.**

Kewalo Marine Laboratory  
Hawaii

## **Naiara Rodriguez-Ezpeleta**

AZTI Tecnalia  
Spain

## **Ilkay Salihoglu**

Near East University  
North Cyprus

## **Declan Schroeder**

Marine Biological Association  
UK

## **Rania Siam**

American Univeristy of Cairo  
Egypt

## **Eva Sonnenschein**

Technical University of Denmark  
Denmark

## **Noga Stambler**

Bar-Ilan University  
Israel

## **Michael Steinke**

University of Essex  
United Kingdom

## **Tinta Tinkara**

National Institute of Biology  
Marine Biology Station Piran  
Slovenia

## **Nadezhda Todorova**

IBER-BAS  
Bulgaria

## **George Tsiamis**

University of Patras  
Greece

## **Valentina Turk**

National Institute of Biology  
Marine Biology Station Piran  
Slovenia

## **Nathalie Valette-Silver**

NOAA  
USA

## **Alessandro Vezzi**

Department of Biology  
University of Padova  
Italy

## **Carol Vines**

Univ. of Hawai'i, Kewalo Marine Lab.  
USA

## **Laura Weston**

Lwandle Technologies  
South Africa

## **Michail Yakimov**

CNR - Institute for Coastal  
Marine Environment  
Italy

## **Takashi Yoshida**

Kyoto University  
Japan

## **Adriana Zingone**

Stazione Zoologica Anton Dohrn  
Napoli  
Italy