Developing the capacity we need for the ocean we want

Moderator
Patricia Miloslavich
Executive Director - SCOR
How to design and implement the capacity development we need to achieve the 2030 agenda?

1. Existing global and regional initiatives that build upon the foundation of capacity development for ocean sciences
2. Lessons learned from case studies and/or success stories from beneficiaries of training programs
3. Recommendations on an action plan for the ocean for scientists, policymakers, local communities and the private sector to accelerate global CD efforts and responses to achieve SDG14 in the current decade
• Developing capacity in ocean observations – opportunities (L. Krug)

• Delivering the training we need for the ocean we want through the Ocean Teacher Global Academy (F. Cardoso Martins)

• The special case of Small Island Developing States (R. Zitoun)

• An NF-POGO trainee perspective – How immersive training and alumni network create international partnership opportunities (P. Carrasco)

• Designing observation networks with data and capacity development in mind: challenges and opportunities (R. Seabra)

• An Action Plan for the Ocean – lessons from the Global Pandemic (C. Robinson)
Dr. Lillian Krug

Partnership for Observation of the Global Ocean (POGO) and Centre for Marine and Environmental Research – University of Algarve (CIMA-UAlg), Portugal

Krug is a specialist in satellite oceanography and is dedicated to research and capacity development in observational oceanography. As Scientific Coordinator for POGO, she helps provide opportunities for other early career ocean professionals (ECOPs), particularly from developing nations.
Developing the capacity we need for the ocean we want

Developing capacity in ocean observations - Opportunities

Lilian A Krug

Partnership for Observation of the Global Ocean (POGO) &
CIMA - University of Algarve
Why observe the Ocean?

- Decipher its variability
- Differentiate natural and anomalous patterns
- Use its resources responsibly
- Understand its reactions to climate change
- Monitor, model and predict extreme events and future changes
- Provide evidence to society & decision makers
Current distribution of observing capacity

Reduced capacity of non-physical observations

Imbalance between Northern and Southern hemisphere

Developing the capacity we need for the ocean we want
Observing Capacity needs

- Training, networking and technology transfer
- Developing nations build self-sustaining ocean observations
- Equip early career ocean professionals with scientific and technical skills

Capacity (development) needs (from 5 highest to 1 lowest)
Training modalities

- Visiting advanced oceanographic institutes
- In-country/regional trainings
- Shipboard training
- Remote training
Visits to advanced oceanographic institutes

POGO-SCOR Fellows mobility

Benefits

- Exposure to state-of-the-art equipment and techniques
- Work side-by-side with world experts
- Establishment of international network for the trainee
- Potential long-term partnership between host and parent institutions

NF-POGO Centre of Excellence in Observational Oceanography

Ten ECOPs from ten countries, study for ten months in an intensive programme at the Alfred Wegener Institute in Germany.

POGO-SCOR Visiting Fellowship

ECOPs from developing countries spend up to 3 months receiving one-to-one training and supervision in ocean observations at a major oceanographic institution.
In-country/regional trainings

POGO-organised/-supported Regional training locations

Benefits

• Reach a higher number of trainee
• Better tailored to local working conditions and resources
• Visiting scientists continue in touch with host institution/trainees (research and mentoring)

Visiting Scholar/Professorships

One senior scientist visited a developing country to conduct training, for 2 weeks to 3 months

Support to Regional Initiatives

Financial support to regional training initiatives covering expenses of trainees from other countries within the region
Shipboard trainings

Benefits

- Trainees acquire skills to organise & participate in oceanographic campaigns
- Hosts receive help with their sea-going work while pass on their knowledge to ECOPs

Floating schools/ Dedicated cruises

Large group of ECOPs pass 1 or more weeks receiving hands-on training

Regular scientific expeditions

Fill spare berths that support the sea-going work and receive one-on-one training from host
Remote/online trainings

Benefits include

• International reach with low cost
• Content can be updated and available for others
• Hybrid component can bring hands-on part
Developing the capacity we need for the ocean we want

Get involved: contact us and know more about our training opportunities

https://scor-int.org/
@SCOR_Int

https://pogo-ocean.org/
@POGO_Ocean

https://iode.org/
@IODEoceant

https://council.science/
@ISC

https://imber.info/
@imer_ipo

http://www.oceantrainingpartnership.org
@ocean_training

Thank you
Dr. Filomena Cardoso Martins

Department of Environment and Planning (DAO) and Centre for Environmental and Marine Studies (CESAM), University of Aveiro, Portugal

Cardoso Martins oversees the Environmental Science and Engineering Doctoral Program and Master in Marine and Atmospheric Sciences at the University of Aveiro. She is responsible for coordination of the Ocean Teacher Global Academy, Regional Training Center – Portugal, and a member of the Portuguese Committee for the Intergovernmental Oceanographic Commission (IOC).
Developing the capacity we need for the ocean we want

Delivering the training we need for the ocean we want through the *Ocean Teacher Global Academy*

*Filomena Cardoso Martins*

OTGA _ RTC-Portugal

University of Aveiro | Dep. Environment and Planning
Delivering as One

OTGA is an UN Ocean Decade endorsed activity since October 2021
IOC Capacity Development Strategy

<table>
<thead>
<tr>
<th>Output</th>
<th>Activity</th>
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</table>
| **1. Human Resources Developed** | 1.1 Academic (higher) education  
1.2 Continuous professional development  
1.3 Sharing of knowledge and expertise / community building  
1.4 Gender balance |
| 2. Access to physical infrastructure established or improved | 2.1 Facilitating access to infrastructure (facilities, instruments, vessels) |
| 3. Global, regional and sub-regional mechanisms strengthened | 3.1 Further strengthening and supporting secretariats of regional commissions  
3.2 Enhance effective communication between regional sub commission secretariats and global programmes as well as other communities of practice (inc. other organisations) |
| 4. Development of ocean research policies in support of sustainable development objectives promoted | 4.1 Sharing of information on ocean research priorities  
4.2 Developing national marine science management procedures and national policies |
| **5. Visibility and awareness increased** | 5.1 Public information  
5.2 Ocean Literacy |
| 6. Sustained (long-term) resource mobilization reinforced | 6.1 In-kind opportunities  
6.2 Financial support by MS to IOC activities |

- Cross cutting Function
- OTGA Contribution to IOCs Capacity Development
OTGA
Global network of Regional and Specialized Training Centres (RTCs & STCs)

17 Regional and Specialised Training Centers

4 languages
English, Spanish, French, Portuguese
OceanTeacher e-Learning Platform
• OT eLP (in short)

Moodle: Modular Object Oriented Dynamic Learning Environment

Learn anywhere, anytime

Open Access
OTGA course organization and management guidelines

The UNESCO/IOC Project Office for IODE is certified as a Learning Services Provider.

ISO 29993

Course Planning
Course Design + Managing course content
Course Facilitation
Course Feedback and Evaluation
Course Certificates
Administration Procedures for onsite and online courses
Quality Management
OTGA Project: lessons learned
Beyond UNESCO/IOC

• Working in partnership

Note: not all partner organisations shown
www.ioc.unesco.org
www.ioc-cd.org
www.oceanteacher.org

Follow us on social media:

Facebook: OceanteacherA
Twitter: @IODE.Oceanteacher

Contact us:
OTGA secretariat - ioc.training@unesco.org
UNESCO / IOC Project Office for IODE, Ostend, Belgium

Acknowledgements:
Cláudia Delgado, Greg Reed, Peter Pissierssens
OTGA headquarters
Dr. Rebecca Zitoun

*Marine Mineral Resource Group, GEOMAR – Helmholtz Centre for Ocean Research Kiel, Germany*

Zitoun works as a Postdoctoral Researcher in the field of Trace Metal Biogeochemistry, Toxicology, and Environmental Chemistry. She is a member of the SCOR Committee on Capacity Development and was a consultant for the International Atomic Energy Agency (IAEA) on scientific and institutional capacity building in Small Island Developing States.
Developing the capacity we need for the ocean we want

The special case of Small Island Developing States

Rebecca Zitoun

Marine Mineral Resource Group, GEOMAR – Helmholtz Centre for Ocean Research Kiel
Young Ambassador, European Marine Board
Ocean Literacy Task Team Lead, Early Career Ocean Professionals (ECOPs) Network
### CAPACITY BUILDING

<table>
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<th>Build Partnerships</th>
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<td>Coordinate Existing Programs</td>
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<td>Data Exchange</td>
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<tr>
<td>Generate Knowledge</td>
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<td>Inform Policy</td>
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</tbody>
</table>

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**THE SCIENCE WE NEED FOR**

**THE OCEAN WE WANT**

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“Building capacity dissolves differences. It irons out inequalities” — *Abdul Kalam*

**CAPACITY DEVELOPMENT IN COUNTRIES WITH LIMITED CAPACITY AND CAPABILITY IS KEY**
Conserve and sustainably use the oceans, seas and marine resources for sustainable development

By 2030, increase the economic benefits to SMALL ISLAND DEVELOPING STATES and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.
CHARACTERISTICS OF SIDS

SIDS - similar sustainable development challenges:

- Remoteness
- Growing coastal population
- Limited resources
- Susceptibility to natural disasters
- Vulnerability to external shocks
- Fragile environment
- Dependence on international trade

“SDG14 IS ONE OF THE MOST CRITICAL GOALS FOR SIDS WHOSE SOCIETIES, CULTURES, LIVELIHOODS, AND ECONOMIES ARE INHERENTLY LINKED WITH HEALTHY, PRODUCTIVE, AND RESILIENT OCEANS”
Lack of:

- Financial Resources
- Human Resources
- Tertiary Education
- Technical Expertise
- Training
- Equipment
- Ocean Information/Literacy
- Monitoring
- Data Products
- Infrastructure
- Logistics

Developing the capacity we need for the ocean we want
CAPACITY BUILDING IN SIDS

- Short-term projects
- Loss of expertise
- Parachute Science & Lack of transparency

- Expenditure < 0.4 % (% of GDP)
- Lack of up-to-date databases
- Remoteness
“ONLY A CONCERTED CAPACITY BUILDING EFFORT WILL ALLOW THE FURTHEST BEHIND TO CATCH UP AND BECOME AN EQUAL PARTNER IN ADDRESSING GLOBAL OCEAN SUSTAINABLE DEVELOPMENT”
Sectors have to work together to achieve common goals

- Broad participation
- Work innovatively, coherently, and in coordination
- Eliminate parachute science
- Establish transparency
- Implement truly collaborative partnerships
- Increase sustained funding
- Increase training
- Develop new approaches and technology

ACTIVITIES MUST BE BASED ON THE PRINCIPLES OF EMPOWERING NATIONAL OWNERSHIP, LOCAL LEADERSHIP, AND SELF-DETERMINATION
• Ocean science capacity has to be regionally focused and equitably distributed

• Effectiveness of capacity development programs must be regularly assessed

• Capacity development is everyone’s responsibility and requires collective actions

• To achieve a successful blue economy all sectors must contribute resources.

“Oceans are the greatest single opportunity we have to get our house in order and make the planet habitable again” –Robert Swan

“There is no ‘silver bullet’ or ‘one size fits all’”
Pedro Carrasco de la Cruz

**Helmholtz Institute for Functional Marine Biodiversity, Germany**

Carrasco is a Peruvian biologist specialized in marine environments and ecosystem models and a postgraduate in Observational Oceanography at the NF-POGO Centre of Excellence at the Alfred Wegener Institute for Polar and Marine Research (AWI). Currently, he is a PhD candidate at the Biodiversity Theory Group of the Helmholtz Institute for Functional Marine Biodiversity (HIFMB).
Developing the capacity we need for the ocean we want

How immersive training and alumni network create international partnership opportunities

Pedro Carrasco De La Cruz
PhD(c) at the Helmholtz Institute for Functional Marine Biodiversity
Alfred Wegener Institute for Polar and Marine Research
PEDRO CARRASCO

I am Peruvian

Biologist and Marine Ecologist

I live in Oldenburg, Germany

Currently I am a PhD Student!!
THE NF-POGO TRAINING EXPERIENCE

NF-POGO Centre of Excellence 2020

Manfred, Antonella, Sharloth, Gabriel, Dieu, Adreeja, Hadeer, Andrea, Pedro & Jeffrey
10 Scholars, 10 months in Germany
Gender balance
130 Alumni, 5 continents, 45 countries
Science Outreach
Club 052: A Dive Into The Blue World (2021)

Antonella De Cian, Andrea Mesquita & Pedro Carrasco

Our Cluberos (13) won the Price to Best Project
BEING A POGONIAN...

Science Outreach
Club 052: A Dive Into The Blue World (2021)
Antonella De Cian,
Andrea Mesquita &
Pedro Carrasco

Global NANO-DOAP
A new permanent monitoring station in Puerto Madryn, Argentina

Our Cluberos (13) won the Price to Best Project
THE OUTCOME ...
Outcome 6: … open and equitable access to data...

Outcome 7... society understands and values the ocean ...

Challenge 9: … comprehensive capacity development and equitable access to data, information, knowledge and technology ...
Cảm ơn
Salamat
شكرا
Gracias
धन्यवाद
Merci
Asante
Obrigado
Danke
Thank you!

WOULD LIKE TO KNOW MORE?
Dr. Rui Seabra

Centro de Investigação em Biodiversidade e Recursos Genéticos (CIBIO) and BIOPOLIS Program in Genomics, Biodiversity and Land Planning, Universidade do Porto, Portugal

Seabra is an intertidal ecologist interested in how temperature influences species’ distributions across all scales. Seabra heads the implementation of a temperature and biodiversity collaborative observation network that will monitor more than 160 rocky shores across the Atlantic for over a decade.
Developing the capacity we need for the ocean we want

Designing observation networks with data and capacity development in mind: challenges and opportunities

Rui Seabra

CIBIO, Centro de Investigação em Biodiversidade e Recursos Genéticos, InBIO Laboratório Associado
BIOPOLIS Program in Genomics, Biodiversity and Land Planning
CCTBON
Coupled Coastal Temperature and Biodiversity Observation Network

FLAD + FCT
~550 K€

+160 rocky shores

140° LAT, 100° LON
+10 yrs

monitor Global Warming in rocky shores at the microhabitat level
MAXIMIZING CD OPPORTUNITIES

- infrastructure
- local HR
- data ownership

- data access
- career development
- networking
microhabitat temperature monitoring infrastructure

state-of-the-art, low-maintenance, long-lasting (>10yrs) costs fully covered by CCTBON (loggers, smartphones, etc.)
human resources - training, collaboration, trust

initial deployment done in collaboration
hands-on training
subsequent data collection done primarily by local researchers
traceable data ownership

temperature and biodiversity data collected using smartphones

ownership embedded in the metadata
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**open data**

**full adoption of FAIR data principles throughout the data pipeline**

**full access to raw and processed data by ALL USERS and for ALL USES**
Biologists ignore ocean weather at their peril

Ecologists must understand how marine life responds to changing local conditions, rather than to overall global temperature rise, says Amanda E. Bates and colleagues.

The ocean can vary on a dime. Temperature, pH, oxygen levels and salinity can vary dramatically across distances of centimeters and within hours. This variability is being recorded continually from thousands of instruments anchored to observatories attached to buoys, ocean gliders and ships. Yet many people think of oceans as a relatively constant environment. This idea might have been bolstered when researchers on the Ships of the World expedition of 1972–75 found average temperature and salinity to be recorded within 1°C of the average for thousands of years across the world’s oceans. The global picture that emerged after averaging these data was one of stability, in which variability had been lost. Certainly that picture was upended by twenty-first-century images of Earth from space, showing the world’s oceans as dynamic living systems. Most biologists and ecologists trying to understand the basic functioning of marine systems are now confronted by climate change factors on large and small scales, on time scales as short as days and as long as centuries. To try to predict, for instance, how a range of global temperature rise of 2°C could affect marine...
Atlantic-wide networking

unique opportunity to engage directly with fellow researchers
regional in-person meetings will be promoted
open doors to mobility of students/researchers from LMICs
www.coastalwarming.com/atlantic-cctbon
ruisea@gmail.com
instagram: @ruiseabra @norterocks
Robinson studies the role of marine bacteria, phytoplankton and zooplankton in the global cycling of carbon and oxygen, with a particular focus on determining the magnitude and variability of microbial respiration using a combination of ecological and biogeochemical techniques. She has led international multidisciplinary research programmes including the Atlantic Meridional Transect, the Integrated Marine Biosphere Research project (IMBeR).
Developing the capacity we need for the ocean we want

An Action Plan for the Ocean – lessons from the Global Pandemic

Prof. Carol Robinson
University of East Anglia, UK &
Integrated Marine Biosphere Research (IMBeR)
Globally, as of 5:24pm CEST, 17 June 2022, there have been 535,863,950 confirmed cases of COVID-19, including 6,314,972 deaths, reported to WHO. As of 16 June 2022, a total of 11,902,271,619 vaccine doses have been administered.
OCEAN RISK is a function of hazard, exposure and vulnerability.

Loss of sea ice
Rising sea level
Increased storms
Increased runoff of terrestrial pollutants
Decreased ocean mixing
Decreased ocean oxygen
Changes in ocean carbon storage
Increased frequency of Harmful Algal Blooms
Establishment of non-native species
Increased vectors of human disease
Changes in distribution of commercially valued species
Loss of tourism & recreational amenities

Key Ocean warming risk

Laffoley & Baxter, 2018
Action Plan for the Ocean

RANK RISKS
Develop a coherent framework to assess and rank risk related to a changing ocean.

Maltby et al., 2022
Murphy et al., 2021
Action Plan for the Ocean

1. RANK RISKS
   Develop a coherent framework to assess and rank risk related to a changing ocean.

2. IDENTIFY ACTIONS
   Use science to identify possible actions in response to risks, taking account of uncertainties.

Murphy et al., 2021
Action Plan for the Ocean

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   Define a set of actions & plans, of which some will need to be adaptive.

Murphy et al., 2021
Action Plan for the Ocean

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Murphy et al., 2021
Developing capacity
An Action Plan for the Ocean – lessons from the Global Pandemic

Next steps
• Develop an integrated ocean community
• Develop capacity
• Targeted workshop
• Propose a UN Decade programme
• Apply for research funds

Get involved
DISCUSSION – Questions?

• Developing capacity in ocean observations (L. Krug)
• The Ocean Teacher Global Academy (F. Cardoso Martins)
• The case of Small Island Developing States (R. Zitoun)
• An NF-POGO trainee perspective (P. Carrasco)
• Observation networks (R. Seabra)
• An Action Plan for the Ocean (C. Robinson)
Get involved: contact us and know more about our training opportunities

https://scor-int.org/
@SCOR_Int

https://iodo.org/
@IODEocean

https://imber.info/
@imber_ipo

https://pogo-ocean.org/
@POGO_Ocean

https://council.science/
@ISC

http://www.oceantrainingpartnership.org
@ocean_training

Thank you for joining!!!