



THE EAST ASIAN SEAS CONGRESS

25 Years of Partnerships for
Healthy Oceans, People and Economies
Moving as One with the Global Ocean Agenda

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SESSION 7: BLUE ECONOMY FORUM

SESSION 7.2

Interdisciplinary Research to
Underpin Sustainable Planning and
Management for Blue Economy

CONVENER:

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25 Years of Partnerships for Healthy Oceans, People and Economies: Moving as One with the Global Ocean Agenda

Iloilo City, Philippines, 27-30 November 2018

Partnership Hub Track 7: Blue Economy

Session 7.2: Interdisciplinary Research to Underpin Sustainable Planning and Management for Blue Economy

28 November 2018; 10:00-12:00
Session Room 8, Iloilo Convention Center, Iloilo City Philippines

Convener: Plymouth Marine Laboratory (PML), United Kingdom

Session Chair: Andrew Bell chairman of the U.K. national Committee for the UNESCO Biosphere programme and UK vice chairman for international programmes; Director of the North Devon, UK biosphere

1. INTRODUCTION

1.1 This session focused on interdisciplinary research, which increases understanding of the economic, social, and ecological systems, and how it should, and can be used to support marine planning, management, and future sustainable development and blue economy.

1.2 The session aimed to:

- Present different approaches to undertaking blue economy-relevant interdisciplinary research;
- Describe innovative decision support tools that are being developed from this research; and
- Discuss examples of how and where these approaches and tools are, or could be used across the multiple and interacting blue economy sectors (e.g., renewable energy, fisheries, aquaculture, tourism, recreation and leisure) to promote sustainability of ecosystem services that underpin these sectors, and are impacted by them.

2. SESSION HIGHLIGHTS AND DISCUSSIONS

2.1 Mr. Andrew Bell, Session Chair (Chairman of the U.K. national Committee for the UNESCO Biosphere programme and UK Vice Chairman for International Programmes and Director of the North Devon, UK Biosphere) briefly introduced the Blue Communities and the UNESCO Man and Biosphere (MaB) Programmes for which he is a co-Chair of the Advisory Group and the North Devon, UK Biosphere is a partner. He outlined the different designated UNESCO sites, i.e., Natural

World Heritage sites, Biosphere Reserves and Geoparks. UNESCO Man and Biosphere (MaB) reserves are model regions for sustainable development, which aim to:

- Conserve biological and cultural diversity at a global scale;
- Provide local solutions to global sustainable development challenges, including climate change;
- Facilitate the application of sustainability science and serve as knowledge and skill incubators;
- Foster resilience of vulnerable groups to build equitable and healthy societies; and
- Explore and test green economy and green society paradigms.

There are three (3) zones in a UNESCO biosphere reserves – a core protected area, a buffer zone, and a transition zone. The transition area does not have an “official” protection and it is here in particular that is necessary to work with society to apply and maintain the UNESCO MaB sustainable principles. There are 205 biosphere reserves that include marine, coastal and island ecosystems. Eighty of these reserves include mangroves. Non-Asian examples include Clayoquot Sound, Canada – where there are conflicts between logging companies and native people. It was designated as a Biosphere Reserve that would exemplify working with indigenous people. The whole island of Menorca in Spain is a Biosphere Reserve that addresses controlling a diversity of fishing techniques. Baa Atoll in the Maldives was designated 5 years ago and has introduced tourism controls, whereby hotels pay a gate-fee for the tourists coming in to the area. Collected fees are used to support conservation of the site and improve sustainability of the hotels. UNESCO Biosphere Reserves touch upon many of the Sustainable Development Goals (e.g., SDGs 1, 2, 3, 7, 11, 13, 14, 15 and 17).

The Blue Communities Programme is working with 3 Biosphere Reserves as case study sites (a fourth is a Marine Park in Malaysia). The programme is working with people living in these areas, examining transdisciplinary science across 12 projects that can be used to improve environmental management and the conditions of the people living locally. Blue Communities explicitly seeks to address SDGs 1, 2, 3 and 14 and aims to build research capability, understanding, tools and applications that would address 5 challenges, namely:

1. Promoting sustainable harvesting;
2. Preparing for climate change;
3. Promoting good health and well-being;
4. Identifying opportunities for growth; and
5. Co-development and implementation of marine planning

The Blue Communities Programme is funded by the UK Research and Innovation’s Grand Challenges Research Fund. The lead partner of Blue Communities is Plymouth Marine Laboratory, UK (PEMSEA Non-country partner) and being led by Professor Melanie Austen. Other partners are Western Philippines University (Philippines), Hanoi National University of Education (Vietnam), University of Malaya (Malaysia), Universitas Nasional (Indonesia), University of Exeter (UK),

University of Plymouth (UK), and NGO partners, including North Devon Biosphere Reserve Foundation, Blue Ventures, International Pole and Line Foundation.

2.2. Professor Melanie Austen (Head of Science: Sea and Society and Lead and Principal investigator of UKRI GCRF Blue Communities, Plymouth Marine Laboratory, United Kingdom) presented on “Interdisciplinary research – aligning the economy with ecology and ecosystems to create decision support tools”. Prof. Austen’s talk described the objectives and implementation of the Blue Communities Programme. Blue Communities is ‘building capability for marine planning in Southeast Asia: because actively, well-managed marine ecosystems are better able to support the health, well-being, food security and livelihoods of people’. Marine Spatial Planning is an approach that determines where each economic sector may act in the marine environment to exploit its natural resources, taking into consideration their distribution, trade-off between sectors, sharing of space, and the economic, ecological and social impacts of these activities. It is a process that brings together multiple users of the ocean – including energy, industry, government, conservation and recreation – to make informed and coordinated decisions about how to use marine resources sustainably. Marine spatial planning generally uses maps to create a more comprehensive picture of a marine area – identifying where and how an ocean area is being used and what natural resources and habitats exist.

The overarching challenge of Blue Communities is to improve the integrated management of marine and coastal environments, reduce conflict between users, mitigate risks associated with expanded or new uses, and protect fragile ecosystems, while supporting livelihoods, food security, health and well-being of coastal communities.

The objectives of Blue Communities are:

1. To provide a research base that supports planning in the marine environment (marine planning) through a novel integration of ecosystem services, ecosystem valuation (monetary and non-monetary), ecological public health, and governance approaches;
2. To increase the research capabilities of the team through training and co-developed research with appropriate stakeholders to address actual marine resource management, economic development, health and well-being, and conservation challenges using the international case studies of the UNESCO Biosphere Reserves and marine protected areas in East and Southeast Asia;
3. To apply research to identify ‘what works’ in fostering well-being, protecting both human and ecosystem health, and achieving sustainable development; and
4. To use the lessons learned to further co-develop and apply practical and cost-effective tools to support decision making and marine planning at local, national and regional scales.

The programme is comprised of 12 integrated collaborative projects, which also include training and capacity building. The projects address governance, health and well-being, ecosystem services and decision support tools, models of the future situation, alternative future scenarios, and

applications (such as marine renewable energy and impact assessment and small-scale fisheries management) and tools (such as remote sensing).

At the heart of Blue Communities is the consideration of marine natural capital and ecosystem services and benefits provided that need to be understood, quantified, valued, managed and used sustainably. The different projects in Blue Communities integrate around the natural capital approach and their synthesised outputs will be used to inform and develop marine planning both in the case study sites and by developing research, approaches and tools that can be used beyond these case studies.

2.3 Dr. Radisti A. Praptiwi (Research Fellow, Centre for Sustainable Energy and Resources Management, Universitas Nasional, Indonesia) presented the “Participatory Approaches in Research on Blue Economy Development: Indonesia Case Study”.

Three selected islands in the transition zone of UNESCO Biosphere Reserve Taka Bonerate Selayar in Indonesia comprise one of the Blue Communities case study sites. The site is located in Selayar Islands Regency, an archipelago of 130 small islands in South Sulawesi Province covering a total surface area (marine and terrestrial) of 4,410,736 hectares. Taka Bonerate Selayar was designated in 2015 and is one of 14 biosphere reserves in Indonesia. The site has a high level of marine biodiversity including turtle species and corals. The reserve is inhabited by approximately 125,000 people. A substantial part of the community lives in the core zone prior to its designation as a National Park, and still live there. A major source of income for the local community is fishery. Recent trends have seen growing tourism activities in the core zone (focused in the coral reef areas) of the area. Pressures on sustainable livelihoods of the local communities arise from destructive fishing (use of dynamite and tranquilizers), pollution from waste and untreated waste water and limited access to energy. Drivers towards sustainable livelihoods include food from capture fisheries and aquaculture and sustainable tourism.

Aspirations for the case study site are: to improve quality and quantity of local products without jeopardising natural ecosystems; to establish sustainable income generation schemes for local communities that promote their well-being; to achieve community awareness and participatory engagement in environmental protection with sustainable livelihoods and climate change adaptation; to improved hygienic living and equal access to basic resources; and to learn lessons that are transferrable to other sites in wider Indonesia.

To achieve the goals, we need to consider the multi-level nature of Governance in the area. The core zone of the Biosphere reserve is managed by the National Park Authority (national government); the buffer and transition zones are managed by local government institutions. This leads to challenges in coordination between different institutions and agencies. The participatory marine governance analysis research in Blue Communities is helping to identify the wide range of actors in the area. The research framework was discussed early on with the stakeholders in the Case Study, who would be engaged beyond the end of the programme including identifying the exit strategy.

Blue Communities has created a NetMap to identify all relevant stakeholders for sustainable fisheries enabling visualisation of the dynamics between the stakeholders, the power of each actor, and the interactions and communications between them. Next steps will be to understand the policy and institutional issues that both constrain and enable the Biosphere Reserve communities to achieve their goals. The aim is to integrate this understanding into biosphere reserve planning/projects, including risk assessments, sustainability plans, conflict resolution, and further stakeholder analysis.

2.4 Professor Lota Creencia's (Lead Researcher, College of Fisheries and Aquatic Sciences, Western Philippines University, Philippines) presentation was entitled, "Building capacity in interdisciplinary research".

To support marine management and sustainable livelihoods in South East Asia, it is essential to build capacity in interdisciplinary research. Our case study sites are strategically positioned within the Southeast Asia region where the biosphere reserves and marine park are operating. Research and management teams with increased capability can then potentially improve the management of marine areas for sustainable livelihoods and healthy people. This particularly addresses the objective of Blue Communities on increasing the research capabilities of the team through training and co-developed research with appropriate stakeholders to address actual marine resource management, economic development, health and well-being, and conservation challenges using the international case studies of the UNESCO Biosphere Reserves and marine protected areas in East and Southeast Asia.

Capacity building of southeast Asian and UK researchers, and local communities is being undertaken in Blue Communities via: co-development and co-creation of research, and skills mapping to identify strengths and training needs, learning-by-doing, research learning and exchange between partners. Learning lessons from research and management; sharing lessons learned, evidence synthesis and identification of evidence gaps, tailored training where needed, considering stakeholder interaction as a key component, ensuring culturally relevant and sensitive research and outputs, and developing regional, national and local teams. There is a cycle of learning between the Blue Communities projects, the Southeast Asian researchers and the coastal communities in the case studies. Capability is being built in the different fields of research relating to the projects. There have been a number of training workshops undertaken that addressed specific needs. In addition, Blue Communities is training the younger generation of researchers through the Early Career Network that it has created, which aims to develop capability in: e.g. publishing research papers, securing research funding, mentorship and well-being, and career development. Blue Communities is also building institutional capability, for example in ethics review processes.

In the Palawan UNESCO Biosphere Reserve site in the Philippines, the entry of opportunities to build more sustainable coastal communities has been boosted through the Blue Communities Programme. As researchers, the capacity to evaluate the situation of the environment and coastal communities has been enhanced with the use of introduced tools. For researchers, another step has been

provided in enhancing communication skills with local government units and coastal communities to promote sustainable use of the marine ecosystem.

- 2.5 Professor Lora Fleming (Director, European Centre for Environment and Human Health and Chair, Oceans and Epidemiology and Human Health, Exeter University, UK) presented on: “Bringing the human health dimension into interdisciplinary marine research”.

There tends to be a rather negative focus on risks to health and well-being when interacting with the marine environment – for example from harmful algal blooms (HABs) and toxins, microbial pollution, man-made chemicals and storms, floods and climate change impacts. Yet, a positive focus demonstrates many benefits of interacting with the marine environment, e.g. food and aquaculture; modeling for forecasting; chemotherapy agents; animals as models for human disease; health and well-being from direct interactions.

The European Union’s Blue Growth strategy does not include very much on health and well-being and has a strong focus on economy. Yet, there are increasing numbers of studies demonstrating that people have better well-being, including less stress, by being immersed in or near the marine environment. For example, self-reported ‘good health’ is greatest in communities living at/or near the coast in the UK and the effect is strongest in poorer communities; coasts are associated with the highest energy expenditure via recreational physical activity; images of blue spaces and marine aquaria with high levels of biodiversity reduce stress symptoms; virtual reality imaging of marine areas reduces experienced and recalled pain during dental surgery.

The Blue Health agenda challenges society to shift human health attention from treatment to prevention, and from a focus on longevity to quality of life over the life course. This can include increasing the quality and quantity of blue and green spaces into cities during urban planning to maximise the positive health and well-being impacts of urban blue space. Large-scale international health and well-being surveys are being undertaken to investigate and compare the effects of green and blue space in rural and urban settings.

Within Blue Communities, similar health and well-being surveys are being co-developed and implemented for use in local coastal communities starting with the Palawan Biosphere Reserve case study site in Western Philippines. These surveys aim to determine if local communities in the case study sites have improved health and well-being if their coastal areas are better managed.

- 2.6 Dr. Goh Hong Ching’s (Senior Lecturer, Department of Urban and Regional Planning, Faculty of Built Environment, University of Malaya, Malaysia) presentation was entitled, “Interdisciplinary research underpinning marine management”.

Interdisciplinary research is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts and/or theories from two or more disciplines to advance fundamental understanding or to solve problems where solutions are beyond the scope of a single discipline or field of research practice. In general, problems are not ordered according to

scientific disciplines. Phoenix et. Al. (2012) present a table of the characteristics of multidisciplinary, transdisciplinary and interdisciplinary research in environment and human health.

Marine environmental management must consider multiple stakeholders and who might benefit or affected from the initiative. Stakeholders in marine management may include:

- National, state, district, local levels, international
- Government agencies, private sector, communities, industry, universities
- Political regime, rules and regulations, cultural practice and mainstream influence
- Funding, enforcement, implementation, scientific research, outreach

Blue Communities case study site in Tun Mustapha park in Sabah is the largest marine park in Malaysia. The marine park is located within the the Sulu-Sulawesi ecoregion. It has very high marine biodiversity but with more than 80,00 people living on the coastline of the park. As such, their livelihood must be considered in marine management. Within Blue Communities, the University of Malay, for example, draws upon and is integrating researchers from various departments and disciplines such as anthropology, environmental economics, fisheries, marine ecology, natural resource governance, public health, tourism and applied geography.

These disciplines and specialisations have different approaches to research. It takes time to learn and understand these, to develop the different languages and communication that are required, and to learn to understand and respect each other. Building inter- and trans-disciplinary research capacity will provide integrated solutions to marine planning that are required.

2.7 The highlights of discussions during the session are summarized as follows:

- Concerning the Blue Communities projects on renewable energy, Earth Observation and habitat mapping. It was explained that these are tools which enable sustainable livelihood. For example, provision of energy to remote communities could transform their livelihoods and prevent them from resulting to destruction of the ecosystems. A further question and ensuing discussion addressed the considerations of equity across different stakeholders. These are being considered in each of the case study sites but also across the research community that we are building in Blue Communities.
- The inclusion of finance issues into Blue Communities. This is an area in which Blue Communities would like to develop capability, possibly through collaborations with other partners. It is clear that there will be economic gains through our approaches, for example from improved health, among others. Blue Communities could link outcomes and processes to develop innovative finance mechanisms such as BIOFIN.
- There was a discussion on the biggest impact that this session could propose to PEMSEA. This ranged from unintended consequences to coastal communities of policies to prohibit or limit the use of plastics, to conversations with national leaders about the use of UNESCO Biosphere as policy-testing areas. If we can show that activities in the marine environment have benefit

and given that health budgets are a growing cost, is PEMSEA engaging with the Ministries of Public Health? How do we bring marine spatial planning and blue space planning the same attention as terrestrial urban planning at department and ministerial level? Multi-national research through an interdisciplinary lens is far more effective and PEMSEA needs to influence governments towards facilitating this. However, PEMSEA is not alone, and needs to collaborate, align and work together with, for example, COBSEA and ASEAN to avoid competing for budget and effort. All of these bodies feed into intergovernmental policy development, some of the data that Blue Communities is gathering must feedback to policy-makers.

- The UNESCO-IOC UN Decade of Ocean Science is not just for marine scientific community. It also seeks to help achieve the SDGs with engagement from all stakeholders. Blue Communities provides a very good example of moving from knowledge to action and should link with the UN Decade of Ocean Science to improve reach and visibility.
- Concerning the specifics of using Netmap models to make the complex relationships of government policies and the public clearer. Netmap examines the “now” to consider the stakeholder relationships. It can do so at the high level (policy makers) and the intermediate level (those implementing policy) but the approaches used, e.g. workshops and/or individual interviews, depend on how comfortable these stakeholders are with each other and how influence and power varies among them.

3. SUMMARY AND RECOMMENDATIONS

3.1 The session heard presentations from Mr. Andrew Bell, Prof. Mel Austen, Dr. Radisti Praptiwi, Prof. Lota Creencia, Prof. Lora Fleming and Dr. Hong Ching about the GCRF Blue Communities programme (www.blue-communities.org) of capacity building for research scientists working to support marine planning and resource management in UNESCO World Biosphere Reserves in the Southeast Asian region (Indonesia, Vietnam, Philippines) and in Sabah Marine Park (Malaysia). Collectively, the presentations illustrated the structure of the programme, its transdisciplinary nature which includes governance analysis, natural capital, ecosystem services and benefits, ecosystem and fisheries modeling, health and well-being in relation to marine environments, renewable energy, and earth observation. The programme leverages opportunities to influence national policy, as well as its direct impact to the communities in the reserves. The workshop was warmly received by the participants.

3.2 Suggestions to improve the impact of the programme included:

- Linking the initiative to the UN Decade of Ocean Science to improve reach and visibility
- Linking outcomes and processes to develop innovative finance mechanisms such as BIOFIN.

3.3 The messages agreed to take forward for PEMSEA were:

- To use the most appropriate and competent networks to push forward the principles of transdisciplinary approaches to support marine planning, policy and management, particularly including the health sector for public spending efficiencies.
- Integrated planning such as source to sea and cross sectoral approaches should be supported by evidence from transdisciplinary research.
- Multi-national collaboration in transdisciplinary research can bring a whole range of benefits to the region.

3.3 The session puts forward the following recommendation to PEMSEA:

- In recognition of the interdisciplinary nature of marine planning and management, we urge that PEMSEA and other regional networks, using the most appropriate competencies, emphasize to member states the need to capitalize on the synergies of integrated planning for improving ocean health and well-being benefits to public health in their development and financing of marine policies.
- The East Asian Seas region to recognize the UN Decade of Marine Science, an initiative led by UNESCO-IOC, as a good opportunity for the delivery and leverage of collaborative multinational and transdisciplinary research for promoting blue economy, healthy and sustainable marine natural capital and ecosystem services, and healthy communities.

Annex 1. Program of Activities

Time	Description
10:00 – 10:15	<ul style="list-style-type: none"> Session Introduction Chair: Andrew Bell, chairman of the U.K. national Committee for the UNESCO Biosphere programme and UK vice chairman for international programmes; Director of the North Devon, UK biosphere
10:15 – 10:30	<ul style="list-style-type: none"> Interdisciplinary research – aligning the economy with ecology and ecosystems to create decision support tools Prof. Melanie Austen, Head of Science: Sea and Society and Lead and Principal investigator of RCUK GCRF Blue Communities, Plymouth Marine Laboratory, United Kingdom
10:30 – 10:45	<ul style="list-style-type: none"> Participatory approaches to explore the costs and benefits of blue economy development Dr Radisti Praptiwi, Research Fellow, Center for Sustainable Energy and Resources Management, Universitas Nasional, Jakarta, Indonesia
10:45 – 11:00	<ul style="list-style-type: none"> Building capacity in Southeast Asia in interdisciplinary research to support marine management and sustainable livelihoods Prof. Lota Creencia, Dean, College of Fisheries and Aquatic Sciences, Western Philippines University, Philippines
11:00 – 11:15	<ul style="list-style-type: none"> Bringing the human health dimension into interdisciplinary marine research Prof. Lora Fleming, Director, European Centre for Environment and Human Health and Chair, Oceans and Epidemiology and Human Health, Exeter University, United Kingdom
11:15 – 11:30	<ul style="list-style-type: none"> Interdisciplinary research underpinning marine management Dr Goh Hong Ching, Senior Lecturer, Department of Urban and Regional Planning, Faculty of Built Environment, University of Malaya, Malaysia
11:30 – 11:55	<p>Panel discussion:</p> <ul style="list-style-type: none"> Using interdisciplinary research to support sustainable development of the blue economy Panelists: Session Speakers; Facilitator: Session Chair
11:55 – 12:00	<ul style="list-style-type: none"> Wrap-up Session Chair