Setting a course for Regional Seas

UNEP

40 ANNIVERSARY Regional Seas YEARS OF ACTION

Regional Seas

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Editorial supervisors
Jacqueline Alder
Alberto Pacheco Capella

Layout
Nikki Meith

Copy editing
Nikki Meith

Overall supervision
Regional Seas Programme
Marine and Coastal Ecosystem Branch,
UNEP Division of Environmental Policy Implementation (DEPI)

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Acronyms

ABNJ	Areas Beyond National Jurisdiction
ALFG/ALDFG	Abandoned, lost or otherwise discarded fishing gear
AOSIS	Alliance of Small Island States
AR5	5th Assessment Report of IPCC
ASEAN	Association of Southeast Asian Nations
BBNJ	Biological diversity beyond areas of national jurisdiction
CARPHA	Caribbean Public Health Agency
CBD	Convention on Biological Diversity
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources of the Antarctic Treaty
CEMP	CCAMLR Ecosystem Monitoring Programme
CEP	Caribbean Environment Programme
CI	Conservation International
COBSEA	Coordinating Body on the Seas of East Asia
COFI	Committee on Fisheries (FAO)
CRFM	Caribbean Regional Fisheries Mechanism
CPPS	Comisión Permanente del Pacífico Sur
DEPI	UNEP Division of Environmental Policy Implementation
EAF	Ecosystem approach to fisheries
EAS	East Asian Seas
EBSA	Ecologically and biologically significant area
EEZ	Exclusive Economic Zone
FAO	Food and Agriculture Organization of the United Nations
GCFI	Gulf and Caribbean Fisheries Institute
GCRMN	Global Coral Reef Monitoring Network
GEF	Global Environment Facility
GESAMP	Group of Experts on the Scientific Aspects of Marine Environment Protection (IMO, FAO, UNESCO, WMO, IAEA, UN, UNEP, UNIDO, UNDP)
GFCM	General Fisheries Commission for the Mediterranean of FAO
GIPME	Global Investigation of Pollution in the Marine Environment of IOC
GOOS	Global Ocean Observing System
GPA	Global Programme of Action for the Protection of the Marine Environment from Land-based Activities
GPML	Global Partnership on Marine Litter
GPNM	Global Partnership on Nutrient Management
GRIDA	Grid-Arendal
GWI	Global Wastewater Initiative
GWP	Global Water Partnership
IAEA	International Atomic Energy Agency
IAEA-MEL	Marine Environment Laboratories, IAEA
ICC	International Coastal Cleanup
ICES	International Council for the Exploration of the Sea
ICRI	International Coral Reef Initiative
ICSU	The International Council for Science
IDB	Inter-American Development Bank
IDDRI	Institute for Sustainable Development and International Relations
IFAW	International Fund for Animal Welfare
IMA	Institute of Marine Affairs
IMO	International Maritime Organization (formerly the Inter-Governmental Maritime Consultative Organization
IOC-UNESCO	Intergovernmental Oceanographic Commission of UNESCO
IPCC	Intergovernmental Panel on Climate Change
IRDR	Integrated Research on Disaster Risk programme of ICSU/ISSC/UNISDR
ISA	International Seabed Authority
ISSC	International Social Science Council
IUCN	International Union for Conservation of Nature
IUU	Illegal, unreported and unregulated fishing
LBA	Land-based Activities
LBS	Land-based Sources (of pollution)
LME	Large marine ecosystem
MAP	Mediterranean Action Plan
MEA	Multilateral Environmental Agreement
MED POL	The marine pollution assessment and control component of the Mediterranean Action Plan
MESL	Marine Environmental Studies Laboratory, IAEA
MPA	Marine Protected Area
NEAFC	North East Atlantic Fisheries Commission
NOWPAP	North West Pacific Action Plan
NPA	National Plan of Action
PAH	Polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCCPs	personal care and cosmetics products
PERSGA	Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden
POPs	Persistent Organic Pollutants
PRCM	West African Regional Marine and Coastal Conservation Programme
RCU	Regional Coordinating Unit (Regional Seas)
RFB	Regional Fishery Body
ROPME	Regional Organization for the Protection of the Marine Environment
RSCAPs	Regional Seas Conventions and Action Plans
RSP	Regional Seas Programme of UNEP
SDGs	Sustainable Development Goals
SIDS	Small Island Developing States
SMS	Seafloor massive sulphides
SPC	South Pacific Commission
SPREP	South Pacific Regional Environment Programme
SYKE	Finnish Environment Institute
TEEB	The Economics of Ecosystems and Biodiversity
TNC	The Nature Conservancy
UNCLOS	United Nations Convention on the Law of the Sea
UN-DOALOS	United Nations Division for Ocean Affairs and the Law of the Sea
UNEA	United Nations Environment Assembly of UNEP
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	International Strategy for Disaster Reduction
WHO	World Health Organization
WMO	World Meteorological Organization
WOC	World Ocean Council

Introduction
Forty years and counting

Earth's oceans face a crisis that threatens to become insurmountable. Depleted fishing stocks, destruction of coastal habitats by urbanization and tourism, warming and rising seas, pollution from maritime and land-based activities, and a host of new perils such as deep sea mining and mid-ocean islands of plastic debris combine to challenge our technical abilities, institutions and willpower to deal with them.

The Rio+20 outcome document *The Future We Want* reflects the international community's deep concern over these threats, even as efforts to address them become increasingly fragmented and ineffective. There are dozens of organizations, many within the UN system itself, with overlapping aims and responsibilities, which require joining forces; and every year new ones are created. While global and regional Multilateral Environmental Agreements (MEAs) play a critical role in global efforts to address environmental issues, there are still enormous gaps in their coverage, particularly in areas beyond national jurisdiction. As we move into the implementation phase of Rio+20, we must find better ways to work together, share responsibilities, and communicate.

In 2014, UNEP's Regional Seas Programme celebrated its 40th anniversary. We are reminded of how successful these 18 regional MEAs spanning seven continents have been at bringing nations and institutions together in responsible stewardship of their shared environment. Around the world, the Regional Seas have improved coastal zone management, reduced land-based pollution, protected priceless habitats, and perhaps most importantly demonstrated solidarity of purpose. Every one of the Regional Seas Programmes fulfills a unique role, by creating an essential link between local and global levels of action and between member countries and the international community.

One accomplishment of Rio+20 was to give UNEP the go-ahead to promote a global transition to a 'Green Economy' aimed at improving human well-being and social equity while reducing environmental risks and ecological scarcities and its marine version, the 'Blue Economy'. This is a perfect opportunity for UNEP to reinforce its commitment to one of its most successful endeavours, and ensure that Regional Seas remains its ocean 'flagship'.

1 Dawn of action

Hands Across the Sand, a popular movement aimed at protecting the ocean environment. © Ababysean | Dreamstime.com

Rio+20 sets the agenda

At the end of the United Nations Conference on Sustainable Development, which took place in Rio de Janeiro, Brazil on 20-22 June 2012, the overall sense of the international community was that the cause of oceans had been heavily strengthened. The media suggested that it might be known as the Oceans Summit, as the momentum generated before world leaders gathered in Rio de Janeiro was something rarely seen before in international environmental fora, with the possible exception of Montreal Protocol on Substances that Deplete the Ozone Layer negotiations back in 1987 and more recently with the negotiations of the Minamata Convention on Mercury.

But it was not to be. Key components, such as a decision on Marine Biodiversity in Areas Beyond National Jurisdiction and action to tackle the challenges of overfishing (IUU) or harmful fishing subsidies, were not approved by the 'concert of nations'.

> *"Regional Seas programmes have brought countries together around common marine conservation goals while improving the knowledge base and strengthening capacities for management and decision making. The Regional Seas approach facilitates collaboration to address needs which, independently, countries would not be able to tackle as effectively, in particular nations with unique circumstances and vulnerabilities such as Small Island Developing States.*
>
> **– Alessandra Vanzella Khouri**

20 years before, in the same Brazilian city, the historic Earth Summit took place as part of the United Nations Conference on Environment and Development. An eloquently elaborated document called Agenda 21 was approved by 178 governments, including 116 Heads of State. For the oceans community, chapter 17: *Protection of the Oceans, all Kinds of Seas, Including Enclosed and Semi-enclosed Seas, and Coastal Areas and the Protection, Rational Use and Development of their Living Resources*, was the response to many years of dispersed actions and governance to protect and sustainably use the marine environment.

The oceans agenda continued to expand through the adoption and implementation of numerous oceans agreements such as the United Nations Convention on the Law of the Sea (UNCLOS) in 1994, the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), and the CBD Jakarta Mandate on the "Conservation and Sustainable Use of Marine and Coastal Biological Diversity" (1995), just to name a few. In addition, the actions taken by governments at the national and local levels were signs that oceans were being taken seriously, underpinned by renewed progress in scientific

> *The Regional Seas Programme helped define governance challenges in many parts of the oceans. In some areas like the Caribbean and Mediterranean it fostered a sense of a shared problem and a search for common solutions. Working with IUCN, the programme assisted many countries to prioritize ocean management issues and decide what programmes were needed to address the increasingly pressing issues.*
>
> *It is hard to measure the wide impact the Regional Seas Programme has had across its many seas, but it is fair to say it has been one of the longest running and most significant programmes of the United Nations.*
>
> **– Carl Gustaf Lunden**

knowledge on oceans and coasts.

At the same time, rifts appeared within the international efforts to protect and sustainably use the marine environment. Critically, there was evidence of an increased fragmentation and lack of coordination among Multilateral Environmental Agreements and institutions, at both the international and regional levels. An overwhelmingly complex ocean governance system evolved. It isolated fisheries (stocks) management within Regional Fishery Management Organizations, separate from management of the overall protection of the marine and coastal environment through the Regional Seas Conventions and Action Plans. As some experts observed, 'fish do not appear to live in the same sea as pollutants'.

Renewed commitments to the implementation of Agenda 21 came at the World Summit on Sustainable Development that took place in Johannesburg, South Africa, in the form of the 'Johannesburg Plan of Implementation' in 2002. Crucially for oceans, it launched the ''Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socio-economic Aspects''. This World Oceans Assessment, to be released in 2015, is set to provide the first benchmark on how well our oceans and seas are doing at a global and regional scale at the end of 2014. As this process has moved forward, the Regional Seas Conventions and Action Plans have played an important role in building the capacities of Member States to engage and contribute to the World Oceans Assessment. This has been possible in part because the Regional Seas Conventions and Action Plans have developed regional State of the Marine Environment Reports every 3-5 years.

The two decades of momentum building heading towards Rio+20, plus new scientific evidence that overfishing, pollution and climate change were creating the perfect storm that would affect future food security for millions of people, provided ~~for~~ a negotiation platform. While Rio+20 did not achieve the far-reaching outcomes that many expected, the 19 articles in the outcome document *The Future We Want*, saw the emergence of oceans as a top political priority, on a par with other environmental crises that the world currently faces. This political momentum is something that we had not previously witnessed, not even in the early days of 1992.

For the Regional Seas Conventions and Action Plans, which have been protecting the marine environment since 1974, these past 20 years have seen a convergence of partnerships being formed to tackle issues from land-based sources of pollution, the creation of networks of marine protected areas, the assessment of coral reefs and the impacts of ocean acidification, and more recently the arrival of the Green Economy approach to oceans.

Certainly, the way forward for the oceans community will be through the implementation of the Sustainable Development Goal for Oceans, as part of the entire post-2015 Development Agenda. In this sense, the Regional Seas Conventions and Action Plans continue to stand ready to help Member States to implement their numerous international and regional commitments to protect and sustainably use their marine environment. F

> *Regional Seas, along with SPC/SPREP in the Pacific, pioneered the regional intergovernmental approach to the management and protection of shared environmental resources. It used the environment to build collaboration between governments that otherwise would not have worked together.*
>
> *It also built scientific and environmental management capacity in developing countries and regions where little attention was paid to this at the time, and created confidence in local scientists as environmental advisers to governments.*
>
> *From an early focus on marine pollution control and oil spill prevention and response, as well as biodiversity conservation, the challenges to oceans and coast today are more integrated. Climate change (rising water temperatures, more extreme events) and ocean acidification are major issues for the future. We are only beginning to consider the implications for coastal areas and ecosystems of a 1-2 metre or more rise in sea level over the next century (and continuing). The environmental impacts of deep sea mining and methane hydrate exploitation are another emerging challenge.*
>
> **– Arthur Dahl**

Crucial cooperation

In the mid-1970s public alarm over pollution in the Mediterranean had reached boiling point. The global marine conventions that existed at the time of the Stockholm Conference were found insufficient to address this problem, even if all 18 countries participated in them. Once work got under way to draft an Action Plan and Convention for the region, the scope of these agreements quickly expanded to include a much wider range of environmental impacts (as defined by GESAMP) to include harm to living resources, hazards to human health, fishing impacts, water quality and loss of amenities.

The first international efforts to protect the Mediterranean Sea did not occur in a vacuum, but received important stimuli from work in other regions, especially the Baltic Sea. As in the Baltic, the scope of the Barcelona Convention was all-inclusive, covering all types and sources of marine pollution. This provided a residual basis for regional cooperation on matters not yet covered by protocols on specific threats.

Close cooperation among scientific and legal experts was crucial to the development of the Barcelona instruments. The need for such interdisciplinary teamwork was a theme at technical meetings for pollution control in the Mediterranean as early as 1970, and by 1974 most of the necessary scientific groundwork needed to identify problems and priorities for legal regulation had already been carried out by FAO and its agency partners. Each successive step leading to adoption of the 1976 Barcelona instruments included constant inter-disciplinary review by joint legal/scientific drafting committees; and scientists and technical experts continued to prove essential for the drafting of technical annexes and supplementary protocol

Coastal development on the Spanish coast. © Vilainecrevette | Dreamstime.com

Early days, early difficulties

The UNEP Regional Seas Programme was, at the time of its adoption (1974), a highly ambitious undertaking. Its early years were occupied in the organization of regional Action Plans, but at the same time, UNEP was heavily engaged in the preparation of the Barcelona Convention for the Protection of the Mediterranean Sea against Pollution (1976) and in the process leading to the adoption of the United Nations Convention on the Law of the Sea (1982), which undoubtedly increased national awareness of the need to manage and exploit rationally the world's marine resources and therefore to adopt and implement the UNEP Regional Seas Action Plans.

When Stjepan Keckes joined UNEP in 1975, he was immediately thrust into the management of its Regional Seas Programme. His approach was to establish Regional Seas as one of UNEP's main programmes, which, of course, covered a much wider range of subjects than marine scientific and environmental monitoring. For the next 15 years, until his retirement in 1990, he pursued single-mindedly and with considerable success the development and implementation of 12 Regional Seas Action Plans. In doing so, he was able to call on a considerable body of experience in the IOC and the relevant UN Specialized Agencies, and in the UN itself, with respect to the marine scientific aspects of the world's regional seas and to the numerous difficulties of inter-institutional and intergovernmental cooperation in each of the UNEP Regional Seas programmes.

Some of the first 12 plans were successful; others less so. There were many difficulties in the organization and coordination of intergovernmental actions and inter-institutional activities in respect of the marine environment. The Mediterranean region featured islands versus continents as well as the numerous mountain ranges which, historically, rendered cooperation between nations more difficult than elsewhere and generated a diversity of languages and cultures. The Caribbean had comparable obstacles: the socio-cultural nature of the region was complex, notably in terms of geography, language (principally Spanish versus English), and cultural background – Hispanic, French, African and British.

Such difficulties required Stjepan's continuous attention during his tenure at the Regional Seas Programme. Somehow even today it remains a UNEP success story, although its future will depend on renewed commitment from UNEP and its partners.

> *"One leading contributor to the early Regional Seas Programme before it was even created was Jacques Cousteau, who with his films and environmental campaigns set the stage for what became one of the UN's most exciting activities. From the Mediterranean Action Plan forward, the Regional Seas team considered communication a key element. We reached out personally to environmental journalists and filmmakers, and as a result managed to arouse the enthusiasm of people living in coastal areas around the world for their own 'action plans'.*
>
> **– Paul Ress**

> *"The first decade of the Regional Seas Programme in Geneva (1975-1985) was a most enjoyable and rewarding professional and personal experience for everyone involved. The successes and achievements of that decade, in my opinion, were due to very well-conceived action plans and programmes, implemented by a highly skilled, motivated and dedicated group of professionals under the leadership of Stjepan Keckes and enthusiastically supported by the late Peter S. Thacher.*
>
> *UNEP's first Executive Director, Maurice Strong, used to say that "the policy is the process". Our process then was to develop integrated action plans for the protection and development of the marine environment and coastal areas of the Regional Seas, at the request and in consultation with the governments of the region. After their formal adoption by regional Conferences of Plenipotentiaries or intergovernmental meetings, we would move into their effective implementation through designated national institutions organized in regional networks working with the technical backstopping of specialized United Nations agencies. This approach was successfully tested first in the difficult Mediterranean region, then applied to ten other seas around the world.*
>
> *Besides the unquestionably high value of the scientific, socio-economic and legal data on which the programmes were based, the secret of their success lay in the process followed in their development and the strong commitment of the people in charge of their implementation. I think that is what made the Regional Seas Programme, in the words of the Secretary General of the United Nations, "the jewel in UNEP's crown".*
>
> **– Mohamed Tangi**

2 The regions respond

Lionfish, an invasive species in the Caribbean. © Xscream | Dreamstime.com

Caribbean: First of the Regional Seas on tropical waters and minds...

Setting up an UNEP office for the Caribbean Environment Programme (CEP) was an extremely exciting mission. It was the first time that a UN programme would involve the wider Caribbean community of English, Spanish, French, Dutch and Papiamento. Not a simple task in a region where political, cultural and economic differences were (and still are) huge.

At that moment, UNEP had set up only one such Regional Seas Programme, in the Mediterranean. The Caribbean was the second programme to be established with all its institutional components: Convention, Action Plan, Trust Fund, Regional Coordinating Unit (RCU), etc. This set of mechanisms was and still is the greatest value of the programme, and unique in the UN system. Countries engage at the regional level, not only around a programme but also by committing legally and financially with contributions from rich and poor members alike.

> *"The NOWPAP region has successfully developed regional agreements and guidelines to address marine litter, spills of oil and hazardous chemicals, eutrophication, algal blooms, etc. The main driver of these actions in our region was the recognition by Member States that they can address regional issues only by working together, not individually. Among our greatest accomplishments, NOWPAP has also enhanced the capacity of experts from Member States in dealing with marine environmental problems – for example, in using remote sensing data, taking countermeasures against algal blooms, responding to spills of oil and hazardous chemicals, and exchanging data and information.*
>
> **– Alexander Tkalin**

The CEP had been negotiated with the full involvement of the majority of countries in the region and at the end, the competition for its headquarters bogged down between Jamaica and Venezuela. Governments finally agreed on Jamaica to host the RCU, among other reasons, because Kingston hosted the UN's Kingston Office for the Law of the Sea (future International Seabed Authority/ISA).

Located in the same building as the Law of the Sea office proved useful. The UNEP Regional Seas Programme had been created as a response to Part XII of the Law of the Sea on Protection and Preservation of the Marine Environment. The Law of the Sea being blocked by some governments, UNEP took the lead in responding to the serious challenge of marine pollution that was growing exponentially by then.

"During my long association with Regional Seas, I thought that one of its major accomplishments was establishing and then backstopping a particular Regional Body (ROPME) which could effectively coordinate a large, integrated pollution monitoring programme involving all eight Gulf nations. ROPME was established some 30 years ago and is still functioning to date very effectively.

This has not always been an easy task given the wars and disputes that have taken place there since then. The key drivers for its success have been Regional Seas' continual support through supplying outside experts for the various activities and hands-on training, as well as that service furnished by other UN agencies. For example, IAEA-MEL has been serving as the Regional Seas Programme's centre for quality assurance and intercomparison of contaminant measurements for all the Regional Seas programmes, including ROPME. This service has been vital in assuring that high quality and reliable pollution data are produced in the various regional programmes.

– Scott Fowler

"We have a strong vision for our region – some 14,000 kilometres of Atlantic coastline, and its adjacent seas, from Mauritania to South Africa. What we don't have among the Contracting Parties are the legal institutions and proper governance mechanisms for marine and coastal management. Environmental standards in these areas to drive and measure our progress toward sustainable development are also lacking. So we're looking to Regional Seas for help in these areas. We are very pleased to see that Regional Seas has moved beyond fighting pollution to encompass the wider considerations of livelihoods and biodiversity – a very important step ahead for its work in Africa.

Happily, we can report that the Abidjan Convention is growing stronger: it's about to be bolstered by an additional protocol on the protection of mangroves – ecosystems that fulfil many essential functions in support of human livelihoods throughout our region. The Convention's revitalization process now under way has been marked by increased secretariat activity; increasing financial commitment to the body; and new regional marine and coastal environmental institutions. Really, there's been a sea change in mentality to protect, conserve and develop the Abidjan Convention area and its resources for the benefit and well-being of its people.

– Abou Bamba

The Caribbean had the second heaviest maritime traffic in the world due mainly to transit through the Panama Canal, and many coastal cities were mushrooming. With tourism and fisheries, two of its main sources of income, proving so vulnerable to marine pollution, it was quite obvious that a major programme was needed.

The Caribbean represents a microcosm of the entire world. It has serious political conflicts (Cuba/USA); extremes in development and wealth: Haiti, Honduras, Nicaragua, Dominican Republic sit alongside many very rich neighbors, including some small islands like Antigua and Barbuda, Bahamas and Barbados. It includes countries with huge territories (USA, Mexico, Colombia, Venezuela), some of the smallest countries in the world in the Caribbean islands and Central America, and European colonial powers (France, United Kingdom and The Netherlands). Hence, in contrast to Latin America, which mostly speaks the same language, the Caribbean hosts many different languages and dialects, including Creole, Dutch, English, French, Papiamento, Patois, Spanish, etc.

The Caribbean economy is threatened and vulnerable. A major oil or chemical spill can destroy in minutes its major sources of income. The transit through the Panama Canal, about to be enlarged, poses a major threat that requires now more than ever, close teamwork among neighbouring countries.

Reducing risk and vulnerability also to natural hazards (hurricanes, floods, drought, volcanic eruptions, earthquakes and tsunamis) is a major challenge to the region, one that calls for close cooperation among neighbours. There is no better system than the CEP to administer responses to such challenges on behalf of the Wider Caribbean countries.

Therefore, the Regional Seas programmes of UNEP still have a major role to play, in close partnership with UNCLOS and the International Seabed Authority, in the implementation of the Law of the Sea and the management of the oceans and coastal environment, and the numerous UN and international programmes – many of which, fortunately, are involved in the CEP.

Mangrove in Fiji making way for industrial and urban development.© Jerker Tamelander/UNEP

SPREP: Primed for action

The Pacific region was already primed for regional action through SPC (founded 1947) and the SPC/IUCN Regional Symposium on Conservation of Nature – Reefs and Lagoons (1969) which led to recruitment of a Regional Ecological Adviser in 1974, the same time that Stjepan Keckes was beginning in the Mediterranean. SPREP has always been more than a Regional Seas Programme, since it includes the whole island environment, terrestrial and marine, which makes sense for coastal environmental management.

> *"The aim of CPPS is to strengthen our work on behalf of marine biodiversity and ecosystem sustainability by means of consensus and joint effort. I am encouraged by the new global effort launched by U.S. Secretary of State John Kerry to save oceans from multiple threats. We share the same Regional Seas vision, because he spotlights the same priorities: over-fishing, plastic pollution and climate change. For this reason we reaffirm our commitment to reinforce ties among the countries of our region in the fight against marine pollution and other activities that harm our marine ecosystems. This could offer a new opportunity for Regional Seas to become a platform for attacking these problems at the regional level.*
>
> **– Rodrigo Guzmán Barros**

The particular challenges faced included rivalry between UN agencies, weak implementation capacity in many countries, frequent turnover of country staff trained by the programme, and lack of local infrastructure to maintain sophisticated laboratories for pollution monitoring.

Nature conservation was the first priority in the region at the time, and SPREP built a solid scientific basis to understand the region's ecosystems, biodiversity and conservation requirements, and made it accessible to governments. One other contributor to success was respect for and incorporation of traditional knowledge of the environment, and a focus on local community responsibility and empowerment. SPREP was the region's own organization, there to serve the region, and had the trust and confidence of

> *"In support of UNEP Regional Seas, GRID-Arendal continues to develop tools and processes to enable Member States of the Abidjan Convention to report on the state of the marine environment. Looking ahead to the next few years, we will work closely with UNEP Regional Seas and the Abidjan Convention Secretariat in the areas of Blue Carbon, ecosystem valuation and marine spatial planning.*
>
> **– Yannick Beaudoin**

> *The Barcelona Convention originally focused on marine pollution control. Over the years its mandate has widened to include biodiversity, integrated coastal zone management, sustainable consumption and production, and climate change. Nevertheless, the Mediterranean environment has continued to deteriorate from overfishing, marine transportation, tourist pressure, pollution, deep-water oil drilling, climate change and – above all – poorly planned coastal development. In the last four decades, the number of people concentrated along the Mediterranean coast grew from ninety-five million in 1979 to one hundred fifty-five million in 2010. We are addressing the continuing and emerging challenges of protecting the marine and coastal environment of the Mediterranean while boosting regional and national plans to achieve sustainable development. The commitment of countries that border the Mediterranean and all stakeholders gives hope that our sea will thrive despite the growing pressures.*
>
> **– Gaetano Leone**

> *One of PERSGA's main priorities is conserving the profound marine biodiversity in the Red Sea and Gulf of Aden, in close collaboration with PERSGA member countries. Another is improving management of marine resources through resource protection, community participation and harmonization of the knowledge base of marine resources between PERSGA member countries. PERSGA is currently very active implementing an ambitious programme in this field based on status assessment and activities on the ground at some pilot sites. Regional Seas may help by introducing advanced experiences from other regional programmes and providing opportunities for performing joint activities and exchange of experience between PERSGA and other regions.*
>
> **– Ziad Abu Ghararah**

the region's leaders. SPREP therefore became an interface between the Region and UN.

SPREP began the process of island collaboration on global issues that led to AOSIS, the islands section of Agenda 21, and the Barbados, Mauritius and Samoa UN conferences on SIDS.

For the future, given the complexity of climate change and the necessary transition to global sustainability, small island developing states and territories will never have the internal capacity necessary to understand and respond to all the issues, so the regional level of collaboration and support provided by SPREP will continue to be essential. More thought should be given to how SPREP can build a coherent body of human capacity between the national and regional levels, with government staff secondments to SPREP for regional training and experience, staff spending some years in SPREP and then returning to national (or other regional) responsibilities, and SPREP able to draw on national experts for regional assignments while supporting a replacement at home. This would make careers in the region more interesting and reduce the brain drain that affects all island countries.

> *As a young professional administrator and marine scientist in the Philippines, tasked with building up a marine science research centre at the University of the Philippines in the 1980s, I found myself involved with the inception of the Regional Seas Programme for Southeast Asia as an implementer of projects and advisor to the government agency charged with the country's participation.*
>
> *The "East Asian Seas Programme", as it was called, initially involved only the five original Member States of the Association of Southeast Asian Nations (ASEAN). Because of its close association with ASEAN, the regional effort followed policies of this association. Our initial concerns with the marine environment focused on pollution and resource degradation, particularly those dependent on coastal ecosystems, notably mangroves and coral reefs. Some concern was mentioned with respect to oil-related issues, including shipping. Because of the small number of countries involved and the very limited contributions to a trust fund, the EAS remained small. As a result of the reluctance of the ASEAN countries to even consider a regional convention on marine environmental protection because of their modus operandi, our progress was modest.*
>
> **– Ed Gomez**

3 Change in the air

Ice shelf formed from the grounding line of a glacier. © 2012 GRID-Arendal/Peter Prokosch

All eyes on emerging issues

Marine ecosystems from the coast to the open ocean continue to be impacted from a variety of human uses. Some uses, such as fishing, are as old as human civilization, while others such as deep-sea mining are more recent. Since the establishment of the Regional Seas Programme in UNEP, Member States and other stakeholders have turned to the programme to support them in addressing the issues arising from human use of the ocean and coasts.

Over the last 40 years the Regional Seas Conventions and Action Plans have responded to emerging issues through partnerships with governments, intergovernmental agreements such as the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA), other agencies such as the International Maritime Organization (IMO) and Intergovernmental Oceanographic Commission of UNESCO, and the private sector. Together they have worked to address issues such as pollution, marine biodiversity and more recently food security from fisheries. However, new issues emerge, or persistent ones continue but in a different form or with a higher level of urgency.

Bringing these issues to the attention of Member States, and more importantly working toward solutions, has been and will continue to be a strength of the Regional Seas Conventions and Action Plans. In the coming decade four emerging

> *"Emerging issues include gearing up of the renewables sector with implications for existing marine uses and marine spatial planning; OSPAR-developed work on marine litter, which has now translated to a regional plan; and finalization of ecological quality objectives for the North Sea. The Regional Seas as a whole have a strong voice on marine litter and marine spatial planning will be relevant to all.*
>
> **– David Johnson**

> *"The emerging issue which we all need to think about is how to adapt our thinking and programmes to increasingly hot and sour oceans and seas as a result of anthropogenic carbon emissions. So far this seems beyond our imaginations. After many years of talk, a key challenge for all of us is to find a way to apply an ecosystem approach that is not just more hot air. What pragmatic ways are we finding of understanding interactions between human activities and the natural environment and how to manage those activities accordingly? Strategic partnerships with other sectoral organizations are key here too!*
>
> **– Darius Campbell**

issues will more than likely influence the evolution of these regional Multilateral Environmental Agreements and UNEP's Regional Seas Programme.

Pollution

The term pollution refers to contamination or degradation of an ecosystem from what can be a wide range of vastly different pollutants, some point source and others diffuse or persistent. Regional Seas Conventions and Action Plans have contributed through partnerships and support to Member States in reducing point-source pollutants such as PCBs and oil. Diffuse and persistent pollutants remain a problem, but with a new sense of importance or urgency as information on their interactions with other ecosystems elements and their cumulative impacts is revealed. Two pollutants of particular concern for UNEP and the Regional Seas are nutrients, for their contribution to hypoxia in many coastal areas, and microplastics for their potential to carry other pollutants. These two pollutant categories represent global problems with solutions that can be shared across all regions. One of the strengths of the Regional Seas Programme is its convening power to bring regions together and formulate regional actions that contribute to addressing such global issues.

Governance

Over the recent decades, with growing recognition of the importance of the ocean in sustainable development, it has been recognized that governance is often fragmented and uncoordinated at the regional level. Supporting Member States in the governance of coasts and shared seas is a key function of Regional Seas. In the lead-up to Rio+20 and subsequently, new frameworks for managing the oceans – especially areas beyond national jurisdiction (ABNJ) – have come under discussion, highlighting the role of regional bodies such as the Regional Seas. Some Regional Seas have already been given the mandate to work in these areas, or are supporting or contributing to the identification of ecologically and biologically significant areas (EBSAs) as we see in the North Atlantic (OSPAR) and the Mediterranean (Barcelona Convention). As the discussions advance, there is a potential role for Regional Seas in supporting Member States in development of an implementation agreement or similar instrument.

Extractive industries

Emerging concerns for Member States include offshore gas and oil extraction and seabed mining, and the continuing and intractable problem of overfishing. There are various environmental issues associated with the exploration and operation of these emerging extractive industries, as well as social and economic issues related to benefit-sharing: these exploited resources are often common property, and the issue can become more complicated in areas beyond national jurisdiction. Fishing as an extractive activity is not a new or emerging issue, but with a better understanding of the links between ecosystems and fisheries, the Regional Seas are responding.

Working across various extractive industry sectors Regional Seas can also contribute to helping the regions in their transition towards a Green Economy approach for oceans. UNEP has developed a working definition of a 'Green Economy' as one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.

Climate change

Cutting across the emerging issues listed above is the spectre of climate change. The recent IPCC Assessment (IPCC 2014 – Synthesis for Decision Makers) reports that effects of climate change on oceans – including sea-level rise, increasing sea temperatures and ocean acidification – have the potential to impact human well-being throughout the 21st century and beyond. Coastal systems and low-lying areas will experience submergence, coastal flooding and coastal erosion, as a result of the projected sea level rise. The IPCC report warned that it felt scientifically confident that "global marine-species redistribution and marine-biodiversity reduction in sensitive regions will challenge the sustained provision of fisheries productivity and other ecosystem services".

Similarly, but with less confidence, it said "ocean acidification poses substantial risks to marine ecosystems, especially polar ecosystems and coral reefs, associated with impacts on the physiology, behaviour, and population dynamics of individual species from phytoplankton to animals" with potential negative consequence for fisheries and livelihoods. When acidification is taken together with other global changes (e.g., warming, decreasing oxygen levels) and with local changes (e.g., pollution, eutrophication) they can lead to unwanted synergistic impacts for species and ecosystems.

The following pages address these four emerging issues in more detail, even as Regional Seas pursue the development of a roadmap for future efforts to deal with them.

Pollution
Old problem, new tricks

Cambodian child playing in coastal rubbish. © Paop | Dreamstime.com

Marine litter

Marine litter is an environmental, economic, human health and aesthetic problem. It poses a complex and multi-dimensional challenge with significant implications for the marine and coastal environment and human activities all over the world. The problems it causes are both cultural and multi-sectoral, rooted in poor solid waste management practices, a lack of infrastructure, various human activities, an inadequate understanding on the part of the public of the potential consequences of their actions, lack of adequate legal and enforcement systems and a lack of financial resources.

> *"Litter accumulation in the marine environment is impacting the use of coastal waters/shores and the delivery of ecosystem services. Regional Seas should include in their activities monitoring and assessment of litter on shore, the water column and the sea bottom, as well as the impact of marine litter on marine fauna and seabirds at regional level. Regional Seas should consider collaborating among themselves to monitor floating microplastics in ocean waters beyond national jurisdiction and to assess the impact of litter, especially plastics, on the open ocean marine environment.*
>
> **– Michael Angelides**

Recognizing the severity of the problem, UNEP initiated quite a number of activities related to marine litter through the work of the Regional Seas Programme and the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA). Numerous activities on the regional and global levels have been conducted, among them:

Global Partnership on Marine Litter. The Global Partnership on Marine Litter (GPML) was launched by UNEP and partners at Rio+20 and acts as a coordinating forum, bringing together diverse organizations working in the same field and encouraging governments, NGOs, scientists and academics to collaborate.

Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities. Adopted in 1995, the GPA is a

> *The Regional Seas Programme is playing an incredibly important but often underrated function with its work on marine litter, and particularly the enormous ocean-wide problem of plastic pollution. It should expand its work by helping to educate people around the world about how to address this issue.*
>
> **– Gail Lugten**

programme that addresses the impacts of land-based sources and activities on coastal and marine environments and human well-being. Litter is one of the nine source categories of the GPA and as such is important for its implementation.

The UNEP Global Initiative on Marine Litter. The UNEP Global Initiative on Marine Litter provides a platform for the management of this problem through the establishment of partnerships, cooperative arrangements and coordination of joint activities. This initiative has been successful in organizing, implementing and promoting regional activities on marine litter in 12 Regional Seas.

Regional level. The regional level is the most important for the management of marine litter. This is the level at which global initiatives, legislation and policies should be implemented. At the same time, initiatives, activities and policies of countries from that region should be harmonized and coordinated. This is a very delicate position which requires a great deal of expertise, coordination and leadership.

> *Concerning the marine pollution sector, over the last four decades Regional Seas has focused primarily on obtaining baseline data on the more classic contaminants such as heavy metals and persistent organic pollutants (POPs) in coastal areas. Some of these contaminants, e.g., mercury and organochlorine compounds, have proved to be critical in the context of marine food chain bioaccumulation and potential risk to human consumers of seafood, and they should continue to be a major focus of study. However many new threats to coastal ecosystems have been identified in recent years, one of which is increasing ocean acidification and its potential effects on certain fisheries – a problem for which we have far less basic understanding.*
>
> *I feel that Regional Seas is in an excellent position to undertake an assessment of what regional and global effects this increase will cause and how best to mitigate those effects.*
>
> **– Scott Fowler**

Twelve Regional Seas have been participating in the UNEP initiated activities on marine litter and all 12 by October 2008 prepared documents for a *Review of the Status of Marine Litter in the Region.* Seven of the participating Regional Seas prepared the document *Regional Action Plan on Management of Marine Litter* (RAP), while the other five proposed actions necessary for the management of marine litter within their regions. In UNEP's document *Marine Litter: A Global Challenge*, an overview and analysis of the regional documents generated through the Global Initiative on Marine Litter were presented for each region.

Regional Plan on Marine Litter Management in the Mediterranean. In the Mediterranean the problem of marine litter was identified about 35 years ago by the Mediterranean Action Plan (MAP) of UNEP. An important step forward towards dealing with the marine litter problem was adoption in December 2013 by the Contracting Parties of the Barcelona Convention of the *Regional Plan on Marine Litter Management in the Mediterranean* and the Contracting Parties were urged to take the necessary financial, legal, administrative and

> *One cooperative venture that is beginning to take shape between UNEP, FAO and IMO is collaboration to quantify, prevent and reduce the amount of plastics accumulating in the aquatic environment and their impacts on fisheries and biodiversity. Interactions along the shoreline between plastics and seabirds, marine mammals and turtles resulting in entanglement or ingestion are relatively well known. However, ghost fishing (the process by which fish and other animals are killed by abandoned, lost or otherwise discarded fishing gear (ALDFG) is less clear. Studies show that some types of ALDFG can continue to catch fish and other animals for up to seven years after loss or abandonment. Floating plastics are also a concern because of their potential to become navigational hazards, with associated safety risks and potential for transporting invasive species. The mandates of UNEP, IMO and FAO overlap with respect to plastics and there are some obvious benefits of inter-agency collaboration when developing policy and implementing best practices on the ground and in the water.*
>
> *At the Global Oceans Action Summit for Food Security and Blue Growth in the Hague in April 2014 it was announced that UNEP in partnership with FAO and IMO will work towards reducing sea based marine litter within the Global Partnership on Marine Litter. FAO looks forward to further strengthening of this relationship.*
>
> **– Francis Chopin**

> *PERSGA has developed a Regional Action Plan and produced Guidelines for marine litter management in the Red Sea and Gulf of Aden. We are currently moving forward towards implementation of the action plan focusing on conducting baseline visual beach surveys for marine litter in member countries; organizing a series of national training workshops on using the Guidelines; and developing a regional sustainable coastal marine litter monitoring programme applying the comprehensive coastal marine litter assessment method, and including clean up and awareness campaigns.*
>
> *The resolutions and decisions of the United Nations Environment Assembly of UNEP at its first session on 27 June 2014 concerning microplastics in the marine environment requested the Executive Director, in consultation with other relevant institutions and stakeholders, to undertake a study on marine plastic debris and marine microplastics, building on existing work and taking into account the most up-to-date studies and data. We express PERSGA interest in being included in such a study. PERSGA would be greatly aided if the Regional Seas could assist in these initiatives.*
>
> **– Ziad Abu Ghararah**

other measures to ensure the implementation of this Plan. The adoption of the Regional Plan, which became binding on 8 July 2014, makes the Mediterranean the first Regional Seas Programme to take legally binding commitments to address such a global concern through concrete actions at both the regional and national levels.

The way forward

There is an increasingly urgent need to approach the issue of marine litter through better enforcement of laws and regulations, expanded outreach and educational campaigns and the employment of strong economic instruments and incentives.

The following points presented below hopefully should assist in the effective approach toward the solution of the marine litter problem:

- Marine litter is a global problem and mitigation actions should be developed around a global framework, coordinated at the regional level and implemented at the national level through development and implementation of national action plans or strategies;
- Marine litter problems should be resolved by and treated as part of integrated waste management approaches;
- Changes in lifestyles and consumption patterns should be promoted and waste volumes should be reduced and efficient recycling should be implemented;
- Regional and national marine litter monitoring programmes, based on internationally accepted methodologies, should be developed and implemented;
- Port reception facilities for handling ship generated wastes and abandoned, lost or otherwise discarded fishing gear (ALFG) should be improved;
- Financial resources and essential funds for the management of marine litter should be identified;
- Studies on the direct economic impacts of marine litter and on the loss of services and goods provided by affected ecosystems should be supported and implemented in order to help prioritize and quantify the economic impacts of this issue; and
- Responsible United Nations organizations (e.g., UNEP, IMO, FAO, IOC) should enhance and coordinate their efforts to work on the marine litter problem. This work must be carried out in close cooperation with civil society, including academia, the private sector and NGOs.

> *Coastal urbanization of the Mediterranean has greatly aggravated the problem of marine litter. In 2013, the Barcelona Convention Contracting Parties adopted the first regional plan to follow up on the global commitment to reduce marine debris adopted at Rio+20 Conference, and an important step toward recovery of the Mediterranean ecosystem.*
>
> **– Gaetano Leone**

Cosmetics: a major source of microplastics in the environment. © Sumnersgraphicsinc | Dreamstime.com

Microplastics

Marine litter is an issue of serious concern, as marine habitats worldwide are contaminated with mainly plastic debris, which is damaging and harmful to wildlife, ecosystems and economies. Once plastic enters the ocean, it breaks into smaller pieces. If under 5 mm, these are called secondary microplastics. Primary microplastics come from, for example, industrial sources, synthetic fibres from washing machine effluents, as well as various personal care and cosmetics products (PCCPs) sold around the world in which they have been added as abrasives or decoration such as glitter and microbeads. Microbeads are tiny particles of plastic that many companies have used to replace natural abrasives like crushed apricot seeds, husks, and pumice.

These non-biodegradable plastic microbeads in many instances are hardly visible to the naked eye and flow straight from the bathroom drain into the sewerage system. Wastewater treatment plants are not designed to filter out microbeads and that is the main reason why, ultimately, they reach and pollute the ocean. It is impossible to collect the microplastic ingredients after they are used, setting them apart from many other larger pieces of plastic trash present in the ocean.

Additionally, knowledge is emerging about the potential for secondary poisoning from marine microplastic ingestion via the food chain, including by humans who consume seafood. Microplastics are sometimes referred to as a "cocktail of contaminants". In the ocean, plastic pieces can act like sponges, absorbing harmful chemicals and pollutants, as well as sometimes leaching their own chemical mixtures.

Many of these pollutants present in the ocean, which can be absorbed onto the plastics, are known "endocrine" disruptors (natural or synthetic chemicals that mimic or block the action of a natural hormone that may disrupt the body endocrinal system) and developmental toxicants, such as PCBs[1] and DDT[2]. Common plasticizers[3] have been recorded in fish, marine mammals and mollusks, and microplastics have been found to have been ingested and retained by filter feeders such as mussels.

[1] PCB stands for polychlorinated biphenyls. These are highly toxic chemical components known to cause skin diseases and suspected of causing birth defects and cancer.

[2] DDT stands for dichlorodiphenyltrichloroethane. These are toxic to animals and tend to accumulate in tissues.

[3] A plasticizer is any of a group of substances that are used in plastics, or other materials, to impart viscosity, flexibility, softness or other properties to the finished product.

> *"In our region, marine litter became an issue around 2005 and unfortunately it does not seem that this problem will be resolved any time soon in spite of Member States (and NOWPAP) efforts.*
>
> *As a past researcher, I am not against monitoring of marine litter. However, spending too much time and effort on establishing comprehensive monitoring programmes might not be absolutely necessary. After carrying out initial assessment, usually it is clear where the litter is coming from and what the prevailing type of litter is – e.g., plastics, fishing gear, etc. This information is usually enough to start addressing major sources: aquaculture and fishing in one region, tourism or illegal dumps in another. For that, simple data cards used in the International Coastal Cleanup (ICC) campaigns are good enough. ICC data in Japan, for example, clearly show some trends in marine litter composition over time.*
>
> **– Alexander Tkalin**

This raises concern about accumulations of microplastics from PCCPs, including polyethylene beads from toothpaste. Dentists have also expressed concerns over the use of polyethylene in toothpaste and have advocated for discontinued use with their clients and amongst other dental hygienists, after having documented that these microplastic pieces had become trapped under their clients' gumlines.

Microbeads are not biodegradable and they are impossible to remove from the ocean. Cleanup of widespread microplastic contamination in the marine environment is futile because the materials are too dispersed, the scale is too vast, tiny organisms would likely be removed along with the microplastics, and the costs would be astronomical. Emission prevention is the key mitigation strategy to solve this widespread pollution.

Under the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), land-based marine litter has been highlighted in the Manila Declaration as a priority source category for 2012-2016, giving UNEP and the GPA a strong mandate to continue working on this issue. Following the recommendations contained in the Manila Declaration, the Global Partnership on Marine Litter (GPML), a voluntary open-ended multistakeholder coordination mechanism, was launched in June 2012 at Rio+20. The GPA provides the Secretariat for the partnership which seeks to protect human health and the global environment by the reduction and management of marine litter as its main goal. The GPML is guided by the Honolulu Strategy – a global framework on prevention and reduction of marine debris. UNEP/GPA is leading on focal area (a) – reduction of land-based sources of marine litter and IMO and FAO are co-leading on focal area (b) – reduction of sea-based sources of marine litter (FAO on abandoned, lost or otherwise discarded fishing gear).

Through the GPML, UNEP is working with governments, NGOs, academia, the private sector, civil society and individuals to further prevent and better manage marine litter. The Regional Seas Conventions and Action Plans, as regional implementers of the GPA, play an important role in developing regional projects and activities aiming at reducing the influx of waste into aquatic environments. The GPA and GPML work closely with the various Regional Seas Conventions and Action Plans around the world in implementing activities such as the development of regional, national and municipal action plans on marine litter, capacity building workshops, compilation of best practices, establishment of regional nodes for the GPML, implementation of demonstration projects on waste minimization and marine litter prevention and media training to increase awareness of the impacts and solutions to the marine litter challenge.

Introduction of legislation supporting bans and phase-outs of microplastics in PCCPs is gaining momentum worldwide. For instance, the state of Illinois is leading the way in the U.S. by banning all microplastics in PCCPs by 2019. California and New York are among other U.S. states that are pursuing similar measures and the European Commission has highlighted marine microplastics pollution as a priority area. The GPML has supported the internationalization of Beat the Microbead (BtM) Initiative, led by the Plastic Soup Foundation, which has now grown to over 50 NGOs promoting the phase-out of microplastics in PCCPs. The BtM online app helps consumers to identify the presence of

> *"Although Antarctica is relatively pristine compared to other regions, we need to be on the lookout for impacts from marine debris on our ecosystems. CAMMLR manages a Marine Debris Database of information submitted by its members from 13 sites, with data from surveys of beaches and seabird colonies and observations of oiling and entanglement of marine mammals in plastic packing bands, and injury to seabirds from abandoned hooks and nets. At the moment the damage caused by marine debris hasn't reached critical levels, but the database will be very useful for comparison with offshore and coastal areas of other Regional Seas.*
>
> **– Leszek Dybiec**

microplastics in PCCPs. It is available for download in seven languages.

In June, 2014, at the first United Nations Environment Assembly (UNEA), more than 150 governments expressed their concern over the marine plastic pollution problem and tasked UNEP with conducting a worldwide study on microplastic debris in the marine environment, as well as to continue with their work toward source reduction and mitigation of impacts globally. UNEP is coordinating this work which will engage various stakeholder groups. Information will be shared via the online Marine Litter Network.

The Marine Litter Network is an online platform managed by the GPML Secretariat that provides a knowledge hub and networking opportunities to promote global discussions on marine litter, and has been designed to facilitate collaboration among supporting stakeholders.

Wastewater discharge on the coast of Senegal. © Birguy Lamizana

Wastewater

Land-based pollutants, primarily arising from sewage disposal, constitute the greatest threat to the marine environment and to public health. In the Mediterranean region, countries dispose of their wastewater directly into the Mediterranean Sea, sometimes treated, though more often than not untreated. The Black Sea is another example where the impact of wastewater discharge has led to loss of biodiversity. In the PERSGA region, it is scarcely any better: uncontrolled discharge of untreated or partially treated sewage into the coastal environment is considered to be one of the most serious threats to the productivity and biodiversity of the seas.

This issue is of concern to both the Regional Seas programmes and the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA). As such, since, its inception, in 1995, the GPA has provided support to most of the Regional Seas, firstly to develop their LBS protocols. Generally, the protocols provide that Parties shall formulate and adopt common guidelines and standards, as appropriate, to deal

with specific sources and activities, on matters pertaining to water quality, and on discharge concentrations into receiving bodies.

In 2003, the UNEP Governing Council Decision 22/2/II urged Governments to adopt, and requested the Executive Director to incorporate with the UNEP Programme of Work (PoW), wastewater collection, treatment, reuse, and reallocation to the natural environment and to assess the feasibility of the development of waste water emission targets within the framework Regional Seas, GPA and in cooperation with relevant UN agencies.

As a follow up, in 2004, UNEP/GPA made an assessment of the source categories of pollution in the regions, and the majority of the Regional Seas identified untreated wastewater as one of the primary pollution source categories. The Black Sea, Caribbean, Mediterranean, Red Sea and the Gulf of Aden and ROPME Sea Area protocols identified wastewater as a priority issue to be addressed.

Against this background, and in response to the UNEP Governing Council Decision (22/2/II- 2003) as well as the GPA Inter-Governmental Review (IGR3) in 2012, UNEP/GPA launched a wastewater multi-stakeholder platform, known as the Global Wastewater Initiative (GWI) and is working hand-in-hand with Regional Seas to assist countries to address the wastewater challenges. In the PERSGA, region, for example, concerted efforts between PERSGA and GPA are ongoing to assess pollution loads related to wastewater discharge into the marine and coastal environment and develop an effective management approach for the region. GPA is also active in Georgia through its Global Wastewater Initiative, aiming to reduce the pollution load into the Black Sea.

Today the GPA plays an active role within the Regional Seas Programme, and a great deal of progress has been achieved in addressing Land-based Activities (LBA) in the regions. However, a lot remains to be done, and a close, concerted and active collaboration between GPA and Regional Seas is key in making any difference. As a starting point, Regional Seas may make use of the developed National Plans of Action (NPAs) by assessing their relevance, where they exist, assisting to update them when needs arise, helping to develop new NPAs in the regions where gaps are identified, and most importantly being involved in their implementation by countries. F

Nutrients

Nutrients such as nitrogen, phosphorus, potassium, and other micronutrients (e.g., calcium, sulphur, copper and zinc) are essential for plant growth, food production and providing adequate nutrition for humans. Producing enough food to feed our growing population will require ensuring an adequate supply of these nutrients. Yet excessive use of nutrients in some regions is causing significant problems.

Humans have massively altered the natural flows of nitrogen, phosphorus and other nutrients. We are converting unreactive atmospheric nitrogen (N_2) into reactive nitrogen compounds (N_r) at unprecedented rates, more than doubling the world's natural rate of supply. We are also mining huge quantities of phosphorus (P) from finite geological deposits, releasing these as fertilizers and other chemicals into our environment. While this has led to increased food production, it has caused a web of water and air pollution that is damaging human health, causing toxic algal blooms, killing fish, threatening sensitive ecosystems and contributing to climate change.

Phosphorus especially is a problem associated with water pollution. The issue of nitrogen is even more challenging. Human activities produce around 120 million tonnes of reactive nitrogen each year. In addition to the production of N_r compounds through fertilizer production and by biological nitrogen fixation, humans inadvertently produce nitrogen oxides (NO_x), which are released directly into the atmosphere, contributing to a cascade of nitrogen effects. These include threats to water, air, soils, climate and biodiversity. The emission of nitrous oxide (N_2O), a powerful greenhouse gas, is one of the main threats from nitrogen pollution. Interactions with other reactive nitrogen (N_r) forms contribute to particulate matter and ground-level ozone, which adversely affect ecosystems and greenhouse gas balance.

Increasing use of N and P synthetic fertilizers is expected to drive larger N and P emissions to the environment. Too much N_r and P affects water quality, causing coastal and freshwater dead zones, hypoxia, fish kills, algal blooms, nitrate contaminated aquifers and impure drinking water. Too much N_r and P also causes the loss of species of high conservation value, which are naturally adapted to few nutrients.

Against this background and nutrient challenge, the GPA has been serving as Secretariat for the

Algal bloom near a sandy beach. © Whitcomberd | Dreamstime.com

Global Partnership on Nutrient Management (GPNM). The GPNM seeks to address how to reduce the amount of excess nutrients in the environment without hindering global development. It provides a platform for governments, the scientific community, the private sector, civil society organizations and UN agencies to enter into dialogue in forging a common agenda, while mainstreaming best practices. It facilitates the forging of more cooperative work across various international and regional fora and agencies addressing nutrients. In order to regionalize the work of the GPNM, efforts are ongoing to establish regional "nodes". These nodes will serve to address the various peculiarities and needs of each region. Great scope exists for these nodes to be formally housed within respective Regional Seas programmes.

For example, in the case of the Caribbean, a platform established in May 2013 now provides a regional forum for member countries to share information on their level of awareness of nutrients management, their strategies to address surplus/ excess nutrients run-off at the national level and to provide recommendations to promote effective sustainable nutrient management across the region. The establishment of the Caribbean Regional Partnership on Nutrient Management entails setting up a type of administrative body or secretariat or an institutional home for the purpose of communicating and coordinating the efforts, time and activities of all stakeholders. The Secretariat of UNEP/CAR was recommended to coordinate and spearhead all activities in that region. This model may be useful to consider in other regions as well.

Extraction of limited resources

Shrimp fished on the coast of Norway. © 2012 GRID-Arendal/Peter Prokosch

Fisheries for the future

A decade ago, FAO warned that virtually every commercial fish species in every ocean or sea is "over-exploited," "fully exploited," or "depleted". Fisheries were in serious decline in nine of the world's 17 major fishing regions, and production from most of them had reached or exceeded the levels at which fish stocks can regenerate. Today the situation has improved in some areas of the world, such as the USA, Australia, New Zealand and the North Atlantic, while other fisheries and regions of the world's ocean continue to see their fish resources decline as a result of intensive fishing, destructive fishing practices, excessive bycatch, weak enforcement of regulations, and hefty subsidies to the fishing industry.

Fish populations aren't the only ones being affected. Fish products are essential to food security, providing more than a billion people with their main source of protein. Fisheries and aquaculture also provide employment in activities such as processing, packaging, marketing, distribution, manufacturing of equipment, nets and gear, construction and maintenance of boats, and so forth. According to FAO, the livelihoods of 10 to 12 per cent of the world's population are at stake.

There is no longer any debate on what actions are needed: better governance through an ecosystem approach, implementing management measures that reduce fishing effort and strengthen enforcement, and innovative economic measures including the phasing out of harmful subsidies, and promoting changes in market and consumer behavior.

There is a huge gap, however, between knowing what to do and doing what needs to be done. Although most Regional Seas do not have a direct fisheries mandate, their role in ocean management can assist in closing this gap through various tools such as marine protected areas (MPAs) and marine spatial planning, as well as building partnerships with fisheries counterparts.

FAO, as the technical specialized agency of the UN with competency in fisheries and aquaculture, has several areas of collaboration with UNEP. For example, a new initiative among FAO, UNEP and IMO will quantify, prevent and reduce the amount of plastics accumulating in the aquatic environment and their impacts on fisheries and biodiversity. They will also work together to reduce the loss and waste of fish and decline of biodiversity from abandoned, lost and discarded fishing gear, through simple procedures such as marking the gear, managing fish aggregation devices and adopting best practices to reduce the risk of ghost fishing.

> *"The food security and livelihoods of those people in the world who rely on marine capture, inland capture and aquaculture fisheries requires maintaining the ecological foundation that underpins healthy fisheries. In the case of marine capture fisheries, the Regional Seas programmes have willing partners in the Food and Agriculture Organization (FAO) and its regional fishery bodies (RFBs) to collaborate in achieving healthy marine ecosystems.*
>
> **– Gail Lugten**

> *Mangroves provide habitat for a broad range of commercially important fish, and up to a third of the fish caught in South East Asia is supported in some way by mangroves. Yet mangrove is still being clear-cut, reducing the annual fish catch potential by as much as 67 tons for every sq km lost. Meanwhile, rising wealth and population growth puts additional pressure on fish stocks world-wide, making many fisheries increasingly unsustainable. The answer is ecosystem-based management that involves all stakeholders.*
>
> **– Jerker Tamelander**

The Regional Seas Conventions and Action Plans have always been linked to fisheries and food security, directly or indirectly. In the early years of the programme, issues such as overfishing and destructive fishing practices were high on the agenda, and Member States expressed the need to work with fisheries agencies such as FAO and Regional Fishery Boards. Regional Seas and FAO have a long history together, beginning with the first steps in the creation of the Mediterranean Action Plan. FAO continues to work with Regional Seas through its regional offices and programmes, its RFBs such as the North East Atlantic Fisheries Commission (NEAFC) and through the General Fisheries Commission for the Mediterranean (GFCM).

Evolving approaches

It took decades to evolve the current cooperative mechanisms needed to address the drivers of degraded fisheries in an integrated manner. Through their biodiversity mandates, many Regional Seas support Member States in establishing and managing MPAs, a tool that is used in ecosystems management and in the ecosystem approach to fisheries. When MPAs are placed in a broader planning framework that includes the various sectors including fisheries, the investment in MPAs in meeting various ecosystem objectives – including ensuring food security and alleviating poverty – is optimized. The evolution of integrated coastal zone management, which brought various sectors to the planning table – including the private sector – was followed by the evolution of the ecosystem approach and with it the ecosystem approach to fisheries (EAF).

> *About 95% of capture fisheries is taken from within the EEZs, which are within Regional Seas jurisdictions. As a consequence, the Regional Seas programmes cannot shy away from the impacts of industrial selective removal of fish on ecosystems.*
>
> **– Dixon Waruinge**

> *There are many potential points of collaboration between FAO, UNEP and other UN bodies in the field of fisheries and aquaculture. UNEP support for effective implementation of existing FAO instruments is welcomed, as is collaboration on issues such as reducing impacts to fisheries and aquaculture from pollution, seabed mining, oil and gas exploration, and minimizing the impacts of fishing on the physical environment and on biodiversity, to name but a few. Many such collaborations are already in progress but much more can be done.*
>
> *From an FAO perspective, the marking of fishing gear, management of Fish Aggregation Devices and adoption of best practices to reduce the risk of ghost fishing can contribute to reducing loss and waste of commercial food fish and loss of biodiversity. Raising awareness of the impacts of abandoned, lost and discarded fishing gear among policy makers and fishing communities is critical. Similarly, FAO believes that involving the fishing vessel operators and crews as true partners in impact mitigation activities is essential. Their profound knowledge and experience gained from working "on the water" for much of their lives can provide great insights into practical and cost-effective solutions.*
>
> **– Francis Chopin**

These developments have provided the potential for unprecedented cooperation between Regional Seas and RFBs. Recognition of the importance of securing the ecological foundation for food security in our oceans and fisheries has further strengthened the need for Regional Seas to join forces with RFBs around the world. The components of healthy ecosystems, such as good water quality and intact habitats, are essential for maintaining and restoring fish stocks: they offer space for successful reproductive behaviour, protect larval fish from pollutants and provide nurseries for juveniles. Investments in fisheries management that do not also address ecosystem requirements cannot be sound in the long term. Strong cooperative arrangements between Regional Seas and RFBs can help to optimize these investments, even if bringing these two institutions into a cooperative arrangement has been a challenge in the past.

Enhancing the welfare of fishing communities, achieving sustainable management of fish resources, and sustainable trade in fish and fish products are critical development goals reaffirmed in the Rio+20 outcome document. As the world transitions to a Green Economy, it is unimaginable that we can achieve one of the principle goals – to free humanity from poverty and hunger – if we don't improve fisheries management.

A brief history of deep sea minerals

There are three main classes of deep-sea minerals – manganese nodules, manganese crusts and seafloor massive sulphides (SMS). Manganese nodules were first discovered lying on the deep ocean floor during the oceanographic expedition of HMS Challenger, 1872-76. Research into their recovery stretches back to the 1970s. The first hydrothermal sulphide systems were discovered on the Galapagos Rift in 1977 and the first expedition devoted solely to the study of manganese crusts occurred in 1981.

Over the last few decades there has been an increase in scientific research into the origin, composition, and distribution of seafloor minerals. Recognizing the economic potential of these mineral occurrences, exploration companies have been mapping and sampling the seafloor across the Pacific region.

SMS deposits have been discovered in the Exclusive Economic Zones of several Pacific Island countries. These deposits contain copper, lead and zinc, and some have very significant amounts of gold and silver. Other deposits consist of manganese nodules and crusts which contain nickel, copper, cobalt, and rare-earth elements (REEs). REEs are used in a variety of high-tech products such as mobile phones (cerium), digital cameras and batteries (lanthanum).

Progress in the development of deep-sea mining technology, the continued rise in global demand (hence prices) for metals, the high grades of ores associated with some marine mineral deposits and increased clarity in the legal frameworks governing exploration and extraction rights, have led countries and industry to consider deep-sea mining as a commercially viable prospect and/or a strategic need.

Some states have shown interest in exploiting mineral deposits beyond national jurisdiction. These rarer metals alone may not be commercially viable, but when coupled with downstream production of consumer goods requiring these metals, may provide a market advantage. There is, however, a legitimate concern regarding our understanding of the different ecosystems associated with deep-sea mineral sites, the economic and social consequences of any development and the contribution of deep-sea mining to the total ecological footprint of countries and regions.

Why are some countries considering mining the deep seabed?

Minerals, and the metals they contain, are essential components of the modern high-tech world. Global stocks of raw mineral resources continue to dwindle, leading to increased pressures to access new sources and maximize resource efficiency. Despite increased innovation and recycling, continued increase in material consumption, has led industry to seek access to previously unattainable mineral deposits.

Additionally, deep-sea minerals are a possible new revenue stream that could support national development goals. In the near future deep-sea minerals could provide income to states from multiple sources, including foreign investment, export earnings and government revenues. Managed correctly this natural capital could be converted into jobs, infrastructure, public service improvements and growth in the domestic private sector. But the imperative is on society to decide whether to focus on maximizing short term financial return or on longer term economic objectives, which balance social goals, including developing sustainable livelihoods, and the preservation of ecological parameters against inequitable, unfocused and unsustainable growth.

What Regional Seas can do

All stakeholders need to be considered when managing deep-sea mining activities in the context of the sustainable use of the oceans. These include actors with non-commercial, subsistence and traditional interests, other commercial interests (e.g., oil and gas exploitation and fisheries), and most importantly future generations and their right to live in healthy and productive ecosystems.

There is growing acknowledgment that human well-being is linked to environmental health and ecological quality. Management practices should therefore be holistic, based on an integrated overview of all present and future human uses and ecosystems services.

The Regional Seas Conventions and Action Plans are a platform through which the transboundary impacts of potential deep-sea mining can be discussed, identified and addressed to avoid conflict linked to social and environmental issues. In the past, mainstream policy-making has tended to treat thematic areas such as fiscal policy, environmental sustainability, natural resource extraction, trade and social impacts separately. The Regional Seas Conventions and Action Plans could be utilized to examine at a regional and sub-regional scale a more integrated framework for sustainable management of non-living resources which considers ecological and new economic thinking in the planning and regulation of these industries.

Such a regional approach to determine a best practices regulatory framework was undertaken in the Pacific Islands region and could be a model for other Regional Seas.

Primary source of content: UNEP, FAO, IMO, UNDP, IUCN, WorldFish Center, GRID-Arendal, 2012, Green Economy in a Blue World.

www.unep.org/greeneconomy

Oil and gas: An African dilemma

From Mauritania, Senegal, and Guinea Bissau to Kenya, Tanzania and Mozambique, recent discoveries of offshore oil and gas hold the promise of prosperity for an every widening number of coastal African countries. However, the pitfalls associated with the development of the industry – economic destabilization, socio-political upheavals, and devastating pollution – are also well known. The challenge before African leaders is clear: how to reap the benefits of hydrocarbon development and minimize the risks.

Oil rig off the coast of Africa. © Sculpies | Dreamstime.com

Establishing management strategies for the sector calls for coordination at both the national and regional levels. Although national authority for oil and gas production are usually vested in a single ministry, the impacts of such development are felt in many other sectors including tourism, fisheries, economy, planning, environment, security, etc. To complicate matters further, an accident in one country can quickly have enormous consequences for its neighbors as winds and currents move pollution across borders.

Over the years Regional Seas bodies have provided critical support to member nations with respect to:

- Gaining and sharing information on risk management, good practices, available technology, and experiences (e.g., Abidjan and Nairobi Conventions and the PRCM Hydrocarbons programme, Gabon's oil spill drills and developing regulation, Sierra Leone and Ghana's use of Strategic Environmental Assessment);
- Addressing challenges at a regional scale by agreeing standards for exploration, extraction, transportation, closure (e.g., agreement on use of Strategic Environmental Assessments);
- Drawing on experiences from outside the region through linkages with other international programmes (e.g., Abidjan Convention and OSPAR);
- Establishing the basis for joint emergency protocols (e.g., spill response); and
- Developing extra-regional consensus coordination between Nairobi and Abidjan Conventions.

Regional Seas programmes also provide a critical link in the nation-region-global chain which characterizes the global economy. By promoting concepts like "Blue Economy" approaches to economic and social development, Regional Seas programmes underscore that environmental and economic strategies are inextricably intertwined and in so doing, provide a backdrop for long-term planning at all scales.

Climate change
and ocean acidification

Bleached coral heads near the Cayman Islands after a hot summer. © Deborah Coles | Dreamstime.com

Managing the inevitable

Scientists in the 19th century speculated that human emissions of greenhouse gases could change the climate, and in his seminal paper, Svante Arrhenius presented a formula for the relationship between atmospheric CO_2 and temperature. It was only around 40 years ago, however, that global anthropogenic climate change began to be recognised as a major threat to international security.

In 1988, WMO and UNEP established the IPCC. The 5th Assessment Report of IPCC (AR5), published in 2014, provides the most authoritative and detailed analysis of climate change and its expected impacts to date. Importantly, AR5 also addresses ocean acidification in some detail, which in the most recent decade has emerged as a growing driver of marine environmental change.

Among its key findings, AR5 expresses high confidence in the following statements.

- As sea levels rise, groundwater and low-lying cultivated areas in deltas and along the coast will experience increased flooding, erosion and salinization, and the erosion of beaches and sand dunes will intensify;
- mass coral bleaching and mortality is the most widespread and conspicuous impact of climate change;
- Ocean acidification will have negative impacts on coral reef formation, maintenance and provision of goods and services such as fisheries, tourism and coastal protection;
- Coastal tourism is highly vulnerable to weather, climate extremes and rising sea levels, and the sectors that rely on reef tourism will be especially sensitive to increases in ocean temperature and acidity; and
- Developing countries and tropical SIDS are most vulnerable to present and future weather and climate extremes, future sea level rise and the added impacts of coral bleaching and ocean acidification.

Adaptation, the natural way

Ambitious and urgent actions are required to mitigate climate change and ocean acidification at the global level. However, there is ample evidence

that ecosystem management can greatly influence local impacts. For example, coastlines and deltas where natural replenishment of sediment has not been altered (for example, by construction and changes in land use) may be less prone to erosion as sea levels rise.

We know that nutrient enrichment increases the susceptibility of corals to bleaching, and fertilizer runoff can increase acidification. Therefore, any strategy for climate change vulnerability reduction in coral reef areas should also address land-based pollution. Fisheries management and the establishment of marine protected areas (MPAs) can further support ecosystem recovery and bolster resilience in the face of climate change, by safeguarding key ecosystem processes.

Adaptation measures that make use of natural ecosystems to reduce vulnerability of coastal communities and sectors can greatly reduce climate change impacts, provided we can realize their full potential through testing, evaluation and continued development. Key to this is the employment of integrated and ecosystem-based approaches to coastal and ocean management that recognize climate change in the context of other drivers of change, including economic development and demography.

Reducing vulnerability, region by region

Regional Seas Conventions and Action Plans were established as action-oriented, regional intergovernmental platforms for marine and coastal environmental management, protection and development. Action Plans, in many cases underpinned by Conventions and associated Protocols, provide for an inter-sectoral approach in identifying and addressing both causes and consequences of environmental degradation. This makes them an important interface between science and policy.

This also gives Regional Seas considerable utility in identifying, agreeing on and implementing coherent regional approaches that reduce vulnerability to global change. Several Regional Seas programmes have already adopted strategies, developed tools and/or implemented activities to reduce their regions' vulnerability to climate change.

Conservation of living resources

The Caribbean Protocol Concerning Specially Protected Areas and Wildlife has provided a mechanism for increasing the number and improving the management of MPAs, through technical assistance and capacity building such as a regional MPA 'Training of Trainers' programme. This enables

Melting sea ice in the Arctic. © 2013 GRID-Arendal/Peter Prokosch

countries to make progress towards the globally adopted MPA target, while increasing the ability of ecosystems to withstand climate change impacts.

Notably, detailed analysis of coral reef monitoring data (*Status and Trends of Caribbean Coral Reefs: 1970-2012*, published in 2014) provides a clear indication that, where conservation and fisheries management has kept populations of herbivorous fish healthy, coral reefs show much greater recovery from hurricanes as well as bleaching events. Indeed, reef condition in the Caribbean today appears more correlated with local management than with climate change impacts experienced so far.

Combined with data on predicted coral reef exposure to climate related stress and inherent resilience, these findings can be effectively brought into regional and national conservation planning and marine spatial planning as well as sectoral reforms. This is currently being pursued through the global coral reef partnership established by UNEP and tropical Regional Seas programmes.

Land-based pollution

Regional Seas programmes also serve a key role in Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA). By prioritizing sewage and nutrient runoff (as well as marine litter) in regional collaboration as well as national planning, the vulnerability of coastal ecosystems to climate change and ocean acidification may be reduced.

Diver recording data on a coral reef, Marsa Alam, Egypt. © j Tamelander

For example, by being strongly embedded in the political and institutional framework of the Nairobi Convention, the project "Addressing Land Based Activities in the Western Indian Ocean (WIO-LaB)" led to development and adoption in 2010 of the Protocol for the Protection of the Marine and Coastal Environment of the Western Indian Ocean from Land-based Sources and Activities.

Ecosystem-based adaptation

Regional Seas can offer opportunities to develop and promote appropriate adaptation actions. In the Pacific, UNEP, SPREP and UN-Habitat collaborated with the Lami Town council in Fiji to develop a model for utilizing cost-benefit analysis in identifying and combining ecosystem-based adaptation options with other, more conventional options. This pilot project found that ecosystem-based approaches are often the most cost-effective, requiring only modest long-term investment while providing a number of additional benefits from ecosystem services, whereas engineering options may be useful in protecting high value infrastructure that cannot be moved. This provides a model for adaptation that is locally appropriate in the Pacific SIDS context and can be replicated by countries and towns across the region, through facilitation by SPREP.

Ecosystem-based mitigation

Coastal ecosystems, which are often an important focus of Regional Seas work, provide particular opportunities for ecosystem-based climate change mitigation. Protection, restoration and management of key vegetated coastal habitats – in particular salt marshes, mangroves and seagrass beds – prevents emissions of carbon stored in biomass and organic sediments, and promotes continued sequestration.

The mitigation potential this provides is significant at the global level, and particularly important for countries and regions where these ecosystems are extensive, and where there are wide ranging

> *"It is difficult for Regional Seas to influence climate mitigation. The emphasis should be on adaptation and implications for coastal communities. Concerns about geo-engineering were not relevant to the North-East Atlantic. The OSPAR Maritime Area is divided into five regions for purposes of monitoring and assessment – the engagement of Parties from these different regions remains uneven, with North Sea countries continuing to drive and finance many initiatives.*
>
> **– David Johnson**

> *"Land-based pollution, unsustainable coastal development and over-exploitation of marine resources continue to pose major threats to the quality of the marine environment and livelihoods of coastal communities. Impacts are exacerbated by the effects of climate change like coral bleaching, diseases and acidification. These threats are not isolated and require today more than ever regional cooperation and concerted action.*
>
> **– Alessandra Vanzella Khouri**

> *The regional approach is most appropriate for certain scales of environmental management, and this should be built into post-2015 planning. Regional Seas programmes could be helped to translate the Sustainable Development Goals, targets and indicators into measures relevant to their own areas and scale of responsibility. Climate change adaptation is another area where Regional Seas structures and mechanisms can play an important role, as in the Pacific. The regional scale may also be an appropriate level to manage the increasing number of people displaced and forced to migrate by sea level rise, for which international legal mechanisms do not presently exist.*
>
> **– Arthur Dahl**

adaptation co-benefits associated with the ecosystem service benefits this brings.

Working with Regional Seas, the UNEP Blue Carbon Initiative is developing and rolling out methodologies for effectively managing coastal ecosystems for mitigation, including utilizing economic instruments to generate cashflows for this.

These regional actions towards enhanced marine and coastal environmental management provide readily available, low-regret approaches that safeguard ecosystem services while reducing vulnerability to climate change and ocean acidification

Young red mangrove, Virgin Islands. © Kate Fuller/Marine Photobank

Facing the inevitable

Climate change and ocean acidification will be with us for the foreseeable future. Because of the lag in earth's climate and oceanic system, they will increasingly influence our lives and living environment for hundreds of years, even under the most ambitious mitigation scenarios.

This requires redoubled efforts to document and analyze vulnerabilities to climate change and ocean acidification, developing specific response plans where needed, and, importantly, to integrate climate change/ocean acidification considerations across sectors and development plans, in order to ensure resilience of both ecosystems and human society.

It will also require special attention to the needs of particularly vulnerable places, such as SIDS and low-lying coastal areas, as well as ecosystems that offer particular adaptation or mitigation opportunities or are particularly sensitive, such as mangroves, seagrass beds and coral reefs.

Lastly, it requires using a Green Economy approach across the public as well as private sector, to reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services.

The Regional Seas Conventions and Action Plans were established before climate change and ocean acidification were high on the agenda, but they were designed to forge a coalition for addressing common challenges at the regional level, through regionally appropriate solutions. As such they provide a foundation that countries and other stakeholders can further develop and build upon for effective responses to the growing impacts of climate change and ocean acidification, in order to maintain ecosystem health and service provision, human well-being and resilience in the face of inevitable change.

> *Climate change and related impacts on the ocean are issues of primary importance for the global oceans. Regional Seas could act as platform for information exchange among their Member States to increase awareness, improve research and to assist on adaptation measures. Implementation of global conventions on hazardous pollutants (Stockholm Convention on POPs and Minamata Convention on Mercury) is a challenge for many Member States, and Regional Seas could act as a platform for regional collaboration and assistance.*
>
> **– Michael Angelides**

Governance

The Arctic Council meeting to adopt the Kiruna Declaration, Vision for the Arctic, in 2013. © 2013 GRID-Arendal/Peter Prokosch

Closer, further, faster

Initiatives conducted within Regional Seas take the uniqueness of a marine ecosystem into account, applying appropriate legal and management tools; the approach goes beyond general principles to fight specific threats to nearby marine areas, wherever these are.

Moreover, regional arrangements sometimes surpass global protection requirements. Last, and more generally, cooperative action is often easier at the regional level than at the global level, where diverse stakeholders with conflicting interests make negotiations thornier. This certainly explains the attractiveness of the Regional Seas programmes, which is surely greater than the "founding fathers" would have envisaged 40 years ago. Within these frameworks, hundreds of conventions, protocols, actions plans and decisions have been adopted by Contracting Parties, making a significant contribution to the development of a comprehensive legal system dedicated to the conservation of oceans and coasts.

However, one must recognize that the implementation of these instruments is far from comprehensive and systematic. Many reasons, often cumulative, can explain this situation, including the lack of political will, funding issues, political instability in some States, lack of capacity or weak enforcement mechanisms. All are weaknesses in the enabling conditions for an

> *"Governance is about decision-making using complete information on the state of the environment, resources, and the relation of coastal communities to those resources. We should ask ourselves whether the Regional Seas programmes in their current form are effective in supporting governance processes at the regional or global levels. More importantly, how effective are we in providing credible, complete and useful information on the environment as well as the socio-economic data required for effective governance of our oceans and coasts.*
>
> **– Angelina E.A. Madete**

> *"Key challenges to OSPAR during my tenure included ensuring the work of OSPAR and other European Regional Seas did not duplicate demands of the EU Marine Strategy Framework Directive. Partnership working and selling the strengths of the Regional Seas to deliver the ecosystem approach helped foster the current arrangement whereby Regional Seas are explicitly required to coordinate implementation.*
>
> *Another challenge was to update the image of OSPAR – its branding and outreach. This was achieved with the support of Parties and teamwork of the Secretariat as well as external advice.*
>
> **– David Johnson**

> *In 2010 the IAEA integrated its marine and terrestrial environmental laboratories to reflect the interconnection between land and sea. This integration provides an opportunity for the Regional Seas to likewise place more emphasis on the links between terrestrial, freshwater and marine ecosystems and the need for improved monitoring across coastal watersheds.*
>
> **– David Osborn**

effective implementation of legal instruments.

There is another major explanation, often discussed at the global scale but barely highlighted at the regional level: while legal agreements have developed significantly in recent decades, the institutional frameworks in which they are adopted have sometimes not kept pace. In particular, despite the entry into force of several legal instruments, many Regional Seas programmes still have the same institutional framework they had when they were created, with limited human and financial resources.

Consequently, the necessary assistance and support to States in implementing the legal agreements are hardly provided by the secretariats, which are almost fully focused on operational tasks. Strengthening the structure of these Regional Seas programmes should therefore be placed at the top of the agenda for the coming years and decades. This is a crucial condition to ensure the effective implementation of the legal instruments adopted. It is also essential in order to provide Regional Seas with the necessary means to face tomorrow's challenges, e.g., the governance of marine areas beyond national jurisdiction, cooperation and coordination with the other international and regional organizations, etc.

The last four decades have seen the frantic development of Multilateral Environmental Agreements up to a point where many stakeholders hesitate between somewhat naïve enthusiasm about and abrupt disenchantment with the hundreds of treaties aiming at ensuring sustainability. It seems likely that the next few decades will be very different, with an ever more limited number of agreements being negotiated and adopted, with a corresponding increase in focus on implementation of existing instruments. Regional Seas programmes should be no exception and, given the disparity of national capacities, technical assistance provided by adequate institutional frameworks will be key if conventions and protocols are to be real game changers. F

Site of the Rio+20 Conference, 2012. © 2012 GRID-Arendal/Peter Prokosch

> *The Mediterranean Sea has been one of the hubs for cultivation of great civilizations. Mostly due to growing human population, industrialization, deep sea drilling and urbanization, it is confronted with environmental challenges such as climate change, coastal urban sprawl, overfishing and loss of biodiversity which are taking great toll on our common future.*
>
> *One possible course of action is to develop a joint mechanism for producing common environmental policies which deploy effective governance. Such governance would have the ecosystem-based approach at its very heart, and include collaboration, participatory action and transparency with the public. This mechanism should be built on long-term flexible planning and tighter cooperation with Regional Seas Conventions. Cooperation between the Barcelona and the Bucharest Conventions would be a promising point to start with.*
>
> *MAP gives us the opportunity to think, plan and act in a common and harmonized way towards not only conserving the Mediterranean but also for securing a future for our children.*
>
> **– Francis Chopin**

Engaging the private sector:

Regional ocean industry leadership and collaboration for sustainability

Leadership and collaboration by the diverse, international ocean business community is essential to addressing ocean governance and sustainability of the dynamic, interconnected regional marine ecosystems. Ocean industries are increasingly held accountable for their impacts and are being confronted on a sector, incident, or local basis (e.g., oil spills, deep sea trawling, port expansion).

Ocean sustainability concerns are increasingly being pursed through coordinated efforts, and unfortunately there is often not a corresponding coordination of effort by the sectorally-fragmented ocean business community to engage these cross-cutting issues.

Ocean stakeholders are pushing for increased regulation in a variety of international venues where international ocean rules are established. Strategic, coordinated industry participation in these processes could be improved, as could balanced, comprehensive information regarding industry efforts to address marine issues.

Private sector access to ocean resources, services and space – even by companies with the best environmental record – is increasingly at risk from the loss of access and social license that results from the kind of ocean governance that is produced by processes in which industry is not well engaged. Regional ocean governance regimes and policies can be significantly enhanced through industry involvement.

> *"Strategic partnerships should include not only fisheries and marine aquaculture industries, but also marine tourism (cruise ships), deep sea mining, nature and biodiversity conservation (WWF, CI, TNC, IFAW, Greenpeace, etc), and SIDS. UNEP could serve as an umbrella interface between the Regional Seas programmes collectively and global initiatives like the World Ocean Council and other global oceans initiatives.*
>
> *UNEP should also liaise with the Group on Earth Observations, IOC-UNESCO, GOOS, GESAMP and other parts of the global oceans monitoring and assessment system to provide relevant data to the different Regional Seas programmes and to ensure that their data requirements are taken into account.*
>
> **– Arthur Dahl**

There are efforts by responsible companies to differentiate themselves from poor performers and try to do business in a more environmentally responsible way. However, the efforts of one company or even a whole sector are not enough to address the collective impacts of a diverse range of industries in a shared regional marine ecosystem.

Business value from sustainability

With the marine environment subject to increasing commercial use, ocean industries have the most to gain by developing and delivering solutions to sustainability. Responsible industry performers are well-positioned to develop and drive business-oriented solutions to marine environmental challenges that address marine environmental issues, differentiate themselves from poor performers, collaborate with like-minded companies within and across sectors, and engage ocean stakeholders and policy processes.

Cross-sectoral leadership and collaboration by the diverse mix of ocean industry sectors can result in significant business value for the operators who commit to a healthy and productive ocean that supports sustainable use by the responsible ocean business community.

'Corporate Ocean Responsibility'

To address these ocean sustainability issues and opportunities critical to business, the World Ocean Council (WOC) was established to create an unprecedented global, cross-sectoral industry alliance on ocean sustainability, science and stewardship. The WOC is catalyzing proactive, collaborative efforts towards "Corporate Ocean Responsibility" by bringing together the diverse mix of ocean industry sectors in support of improved business, continued access and reduced risk.

The WOC is developing regional multi-industry groups which interface well with the Regional Seas programmes of UNEP.

www.oceancouncil.org

East African children sailing toy dhows. © 2013 GRID-Arendal/ Yannick Beaudoin

Regional Seas as innovative bodies

Since the adoption of the Regional Seas Programme in 1974 and the subsequent establishment of Regional Seas Conventions and Action Plans, several transformative developments have taken place. Some of these have occurred outside the programme itself, for example in the context of the adoption of global agreements related to the protection of the marine environment: the IMO conventions, CMS, CBD, the chemicals conventions (Basel, Rotterdam and Stockholm), etc.

In addition, climate change has become an important source of disturbance to the marine environment which cannot be ignored by Regional Seas, especially in terms of assessment and adaptation in the context of the UNFCCC.

Therefore, one of the main challenges faced by Regional Seas in the coming years will be to fill the essential role as a platform for (1) the implementation of regional action plans and legal instruments such as conventions and protocols, and (2) the implementation of global instruments at the regional level.

Moreover, individual Regional Seas could act as "explorers" and lead the way for the adoption of rules in areas which are not properly covered by global conventions, such as land-based sources of pollution, offshore oil and gas activities, and Integrated Coastal Zone Management.

A specific case in point is the establishment of marine protected areas (MPAs) beyond national jurisdiction. MAP and OSPAR established such MPAs in the context of their regional rules, thus testing the potential for such initiatives and illustrating their legal limits, pending the possible adoption of a global agreement.

New directions

This issue illustrates the capacity of Regional Seas to take action and explore new directions at the regional level. At the same time, it reveals the urgent need for perfecting global instruments such as the Law of the Sea, with a view of providing a more solid basis for regional initiatives. It shows the potential role of the 18 Regional Seas not only as implementing platforms but also as innovative bodies. It demonstrates clearly that the connection between global and regional levels has become a major challenge for bringing about efficient governance of the marine environment.

4 On the horizon

Gangplank into the sea, Seychelles. © 2010 GRID-Arendal/Lawrence Hislop

Strategic partnerships: **Trust and inspiration**

Effective regional governance cannot be achieved in isolation. Regional Seas Conventions and Action Plans must interact and cooperate with appropriate sectoral regional and global entities, as well as draw inspiration from one another. Partnerships foster coordinated regional implementation of relevant Multilateral Environmental Agreements; they forge synergy between UN Agencies and attract support from international financial institutions. The UNEP 'family' of Regional Seas and Action Plans has agreed strategic directions, principles and priorities to strengthen international marine governance and to help implement the sustainable development agenda.

> *"Geographically the convention areas of the Abidjan Convention and OSPAR are nearly contiguous: between them they cover an area from the North Pole to the southern tip of Africa. These two Regional Seas Conventions also share common goals for the protection and conservation of their respective marine environments, and a commitment to look beyond their convention areas to cooperate with other competent regional organizations. A recent memorandum of understanding between their secretariats creates a framework for exchange of knowledge and information. In response to the growing intensity of oil and gas exploration in West Africa, it focuses initially on the sharing of OSPAR's experience relating to offshore industries. It also considers ways to improve cooperation between environmental and fisheries management organizations as a means of sustaining healthy human communities.*
>
> **– Victor Escobar Paredes**

Each Regional Seas Convention and Action Plan binds governments to jointly formulated guiding principles. Cornerstones within each region include a holistic plan recognizing the value of its regional ecosystem services; joint monitoring to gather comprehensive long-term data as the basis for regular assessments; and status reporting to regularly describe, evaluate and compare each region in the context of addressing key pressures.

This collective approach is the recipe for long-term success: promoting responsibility and stewardship. It is a long and dynamic iterative process that must bind partners and convince citizens.

Formalizing partnerships can help this process. For example, OSPAR initiated Memoranda of Understanding with the North East Atlantic Fisheries Commission, International Seabed Authority and North Atlantic Salmon Conservation Organization (there was already a long-standing Agreement with the International Maritime Organization). OSPAR also signed a letter of agreement with the Sargasso

> *While the preparation of legal instruments mainly involves experts and diplomats, their eventual acceptance and ratification depends on political factors usually beyond the control of the drafters. National support for draft regional instruments can, however, be facilitated by appropriate advance information through existing governmental and non-governmental organizations in the region concerned. In the Mediterranean this role was carried out by the 1974 Inter-Parliamentary Conference of Coastal States on the Control of Pollution in the Mediterranean Sea (Rome) which endorsed the drafting effort.*
>
> **– Peter Sand**

Sea Alliance and started a process to achieve a 'Collective Arrangement' of understanding between all competent authorities for its Maritime Area. The success of these strategic partnerships has been acknowledged and subsequently further operationalized. Perhaps the most relevant relationships are with other organizations focusing on the region concerned, but the global links are important too. OSPAR has also developed a capacity building twinning arrangement with the Abidjan Convention that has found new impetus in recent years.

UNEP support to provide strategic direction and global overviews is essential. UNEP can assist Regional Seas to participate in the future Ocean Sustainable Development Goal, World Ocean Assessment process and UN Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction. UNEP can match Regional Seas with opportunities for strengthening capacity, funding, communicating successes and promoting compliance and enforcement. Inter and intra-regional partnership successes rely on making connections between communities and their environment.

Regional Seas should continue to highlight case studies of how collective partnership approaches result in wins for the coastal and ocean environment. UNEP can help draw attention to concrete examples and continue to convince States about the relevance of Regional Seas. UNEP can also help broker links between Regional Seas and LME Projects and LME Commissions as a means to effect better global coverage of regional governance.

Strategic partnerships rely on trust and inspiration: understanding differences in rules, opinions, priorities, finances and cultures. Finding common ground and accepting compromises takes the process forward. For Regional Seas this is an essential challenge and winning advantage. F

> *OSPAR is proud of its work with the North East Atlantic Fisheries Commission, through an MoU and now through a Collective Arrangement on cooperation regarding Marine Protected Areas in Areas Beyond National Jurisdiction. We can reflect on successful joint processes that have overcome differences in perspectives from our two organizations. We are looking to extend existing cooperation with the International Maritime Organization and the International Seabed Authority.*
>
> *In Europe we have the unique situation of the Regional Seas interacting with the European Union in its regional environmental legislation. In serving the needs of our Contracting Parties who are Member States of the European Union, we are ensuring our systems deliver the outputs and management tools they need to meet EU directives, while at the same time meeting the needs of all our Contracting Parties. This is an evolving process which we aim to harness to ultimately ensure we work more efficiently for everyone in delivering marine environmental protection.*
>
> **– Darius Campbell**

> *It is evident that ocean and coastal ecosystems suffer – perhaps more than any other ecosystem – from knowledge and governance deficits and also from a relationship deficit, as society tends to over-rely on objectifying the oceans rather than acknowledging the circular connection between the needs people want met and those the ecosystems themselves require to function. Although there is an understanding and general acknowledgement of the value of marine ecosystem services, and a willingness to take action, there remains a lack of tools, processes and information to enable the needed action. A TEEB for Oceans and Coasts (TEEB4OC) effort seeks to identify and fill key knowledge gaps and facilitate the enabling conditions to enhance sound decision-making at all levels of society. GRID-Arendal is supporting UNEP in the development of an international effort that will prototype methodologies with Regional Seas Conventions and Action Plans.*
>
> **– Yannick Beaudoin**

Bedrock science

Science, including monitoring and assessment, has always been considered the bedrock for the activities of both OSPAR and the Regional Seas Programme.

Scientific evidence has helped underpin our decisions, whether on the action needed to be taken on a particular polluter (for instance on tributyltin (TBT) antifoulants), or for the protection of a species or habitat. For example, measures concerning OSPAR's list of threatened species and habitats are based on detailed background assessments. Monitoring has shown where actions are effectively dealing with an issue – for instance the observed decline in the level of polychlorinated biphenyls (PCBs) in biota – or whether further action needs to be taken.

OSPAR has aimed to make this evidence base available through regular assessments. Its major

> *"It is important that UNEP continue to provide strategic direction and global overviews. UNEP can assist Regional Seas to participate in the future Ocean Sustainable Development Goals, World Ocean Assessment process and UN Ad Hoc Working Group on BBNJ.*
>
> *Regional Seas should continue to highlight case studies of how collective partnership approaches result in wins for the coastal and ocean environment. UNEP can help draw attention to concrete examples and continue to convince States about the relevance of Regional Seas organizations. UNEP can also help broker links between Regional Seas and LME Projects and LME Commissions as a means to effect better global coverage and sustainable funding.*
>
> **– David Johnson**

Preparation for slicing a sediment core. © Hartmut Nies

state of the seas assessment was the Quality Status Report (last done in 2010), which covered every sector that OSPAR deals with and which broke new ground in simple ways of displaying information. OSPAR continues to produce summary assessment sheets and publications, such as the Coordinated Environmental Monitoring Programme Assessment reports, on various aspects of its marine monitoring in order to provide clear communication products to decision makers and the interested public.

The one area that is still elusive is how to bring together the evidence that is inevitably presented in categories such as biodiversity, hazardous substances, human impacts, into a truly integrated assessment. Some attempts have been made globally, such as the Ocean Health Index with its country-focused breakdowns. OSPAR, however, aims to continue a 'Regional Seas' approach which better matches ecosystem scales.

OSPAR's five regions reflect the coherent ecosystems of the Arctic, the Greater North Sea, Celtic Seas, the Bay of Biscay and Iberian Coast and the wide Atlantic; assessments done at these scales offer a real opportunity for ecosystem-based management to become a reality rather than a catch phrase.

> *"No matter how passionate the debate over environmental policy or within the scientific community, we must keep a clear focus on the most important goal: best decisions and actions for a healthier marine environment. Acting as a successful interface between science and policy requires both intact results from the field of research as well as continuous strong support from the policy makers. Moreover, reliable and unbiased data will enable legitimacy for Regional Seas programmes in the eyes of government and citizens alike.*
>
> **– Monika Stankiewicz**

OSPAR is currently planning an intermediate regional assessment in 2017 with a full Quality Status Report around 2021. As the basic science, monitoring and assessment is carried out through Contracting Party scientists, OSPAR also looks to cooperate with others to develop new methodologies. By working with organizations such as the International Council for Exploration of the Sea (ICES), OSPAR is currently exploring ways to fully understand the cumulative impacts of human activities on the marine environment. It's purpose

> *"Legitimacy in the eyes of governments and citizens stems from reliable unbiased data. Regional Seas programmes need to have the necessary resources to collect reliable data related to the state of the environment and share it openly.*
>
> **– Saija Vuola**

> *"CCAMLR has maintained a close affiliation with the work of the Regional Seas since its establishment in 1982. CCAMLR is well known for its ecosystem approach, a principle enshrined in the Convention. As early as 1987, CCAMLR implemented an Ecosystems Monitoring Programme (CEMP) to monitor selected prey, predators and environmental parameters, thus providing information relating to ecosystem responses to influences such as harvesting and climate change in the Antarctic. This is particularly relevant to the future work of the Regional Seas Programme.*
>
> **– Leszek Dybiec**

> *"An oft-repeated management mantra is that "if it can't be measured, it can't be managed." The Regional Seas and the IAEA have collaborated for many decades to promote comprehensive and robust science as a basis for environmental decision-making by the respective Member States. This has included scientific training and marine monitoring programmes, the development of new analytical methods, and improving the proficiency of laboratories where environmental samples are analysed.*
>
> *Our mantra applies equally to environmental management. High quality analytical laboratories, as well as training and capacity building in environmental monitoring, are essential to providing the timely and comprehensive data that governments require to measure performance and make informed decisions about their environmental problems. There is great scope for the IAEA, UNEP and the Regional Seas to increase the research and analytical proficiency of environmental monitoring institutions and to facilitate the exchange of data and experience.*
>
> **– David Osborn**

> *For 40 years UNEP/MAP-MED POL has collaborated with the IAEA Environment Laboratories in Monaco to strengthen data quality assurance vis-a-vis the analysis of trace elements and organic contaminants in marine samples. In the framework of this collaboration, as many as 30 interlaboratory comparison exercises and 15 proficiency tests were organized with the participation of Mediterranean laboratories, 300 Mediterranean scientists were trained on the analysis of hazardous contaminants in 52 training courses, and 63 recommended methods for the analysis of contaminants in marine pollution monitoring programmes were jointly developed by IAEA, UNEP Regional Seas and IOC-UNESCO. These are available on-line in the website of UNEP/ Mediterranean Action Plan.*
>
> **– Michael Angelides**

is to integrate information on natural and human-induced changes to the marine environment, and communicate the result to decision-makers within OSPAR, at the same time aiming that the information can influence others, for instance those managing fisheries.

While OSPAR's science and assessment products are available for interested stakeholders through its publications and websites, the real targets for such work are the policy makers within OSPAR's Contracting Parties. This means that the priority for OSPAR is to have an effective policy-science dialogue so that the scientists understand the level of evidence and certainty needed for the policy makers to assess risks, costs and benefits involved in the particular issue at hand. This has to be a balance of accuracy against time and cost pressures, and may often be a different approach from that practiced in an academic context. This is a crucial element, and one of the strengths OSPAR has through its Contracting Party-led work, carried out through working groups and committees, where scientists and policy makers meet and work together.

Unlike in other Regional Seas, OSPAR Contracting Parties, despite ever decreasing resources, have been able to rely on national science capacity rather than being heavily reliant on the support of global processes. This highlights the need for organizations like GESAMP to step in when a region's member countries lack the resources or expertise to produce their own baseline data.

The OSPAR Secretariat appreciates the need to share experience in this field so that lessons can be exchanged and new opportunities created to do things more effectively and efficiently (back to that issue of resources). Regular updates between secretariats and partnerships between the Regional Seas can help in this process.

> *The Cartagena Convention offers a prime example of the need for training and capacity building through the Regional Seas. We have huge problems trying to produce, compile and unite the baseline data for our region, owing to the widely-differing installed technical capacity among Caribbean countries. The lack of reliable data properly processed, in turn, hinders the adoption of appropriate measures and policies that must be science-based; for example, for the integrated management of resources and to reduce the impacts of global changes. As well, the Regional Seas Programme also provides a good scenario to join efforts for climate vulnerability assessment in coastal marine areas and take actions for adaptation and mitigation, sharing experiences and establishing areas of cooperation, using existing mechanisms or creating new ones.*
>
> **– Nina Lysenko**

> *The main challenges I faced during the early years of ROPME was in the area of training the local scientists in contaminant survey work and, in particular, trace contaminant analyses. Such analyses routinely require state-of-the-art analytical instrumentation, and many of these recently trained analysts lacked the proper equipment in their home laboratories. This came about either through improper planning and allocation of funds, or from government bodies' lack of understanding about what was really needed to do good science. Consequently, this problem was often a major obstacle for certain ROPME countries to be able to achieve reliable and verifiable results within a reasonable period of time. An added complication was that often the country's laboratories were sub-standard and not set up to properly house such analytical equipment which also led to major delays in producing data for the programme.*
>
> **– Scott Fowler**

Indicators of achievement

Since the UNEP Regional Seas Programme was launched in 1974, most of the Regional Seas have regularly undertaken assessments of the state of their marine environment, either under the UNEP-coordinated Global Assessment of the Marine Environment or through their own initiatives. In many cases their work involves an assessment of the state of the marine environment which did not record chronological changes. The assessment was also not linked with the objectives and expected outcomes in the Regional Seas Action Plans.

In each of the Regional Seas Action Plans, the objectives and expected outcomes are clearly stated. But their achievements have not been tracked using a set of carefully selected or technically based indicators which would allow them to monitor comparable environmental changes over time.

UNEP has begun developing a set of standard indicators for Regional Seas. It is UNEP's intention to connect this initiative with the Sustainable Development Goals (SDGs) under development by the United Nations. The achievement of SDGs, once agreed, will be measured by a set of indicators.

UNEP has already developed a set of indicators for the Transboundary Waters Assessment Programme, targeting Large Marine Ecosystems and the Open Ocean. To date, however, the Regional Seas have had difficulty in applying them to their Regional Seas assessments. Most, including the Helsinki Commission, Mediterranean Action Plan and OSPAR Commission, have already developed their own indicators for a variety of purposes, for example reporting to their Conference of the Parties on the convention/protocol achievements, the state of the marine environment, and action plan implementation. The indicators used in these programmes are shown in the UNEP report Measuring Success – Indicators for Regional Seas Conventions and Action Plans. More indicators were presented at the UNEP-convened Technical Workshop on Selecting Indicators for the State of Regional Seas on 30 June – 2 July 2014, Geneva, Switzerland (all presentations are available on the Regional Seas website; see url below).

A core set of Regional Seas indicators should be based on the already existing regional and global indicators and supporting datasets. This initiative coincides with the effort by UN Member States to proceed with the World Ocean Assessment, a regular process to review the environmental, economic and social aspects of the world's oceans and seas.

Coastal monitoring station, Norway. © 2012 GRID-Arendal/Peter Prokosch

The above-mentioned workshop concluded with the recommendation to form a working group among the Regional Seas to further develop a toolkit of indicators based on the ecosystem approach the Regional Seas programmes are introducing. Eventually an agreed core set of indicators will be used by Regional Seas in their effort to compile the report on the state of the marine environment, and to monitor the collective achievement of the programmes in addressing regional and global marine environmental issues.

This experience from the initiative of developing a common set of indicators highlights a need for Regional Seas to more clearly and more rigidly introduce an ecosystem approach that establishes common ground on which to base a common set of indicators. Their efforts to achieve the objectives and expected outcomes of their Action Plans need to be clearly stated so they can be measured by applying indicators. The workshop and this process have functioned thus far as a mechanism to share information on the initiatives each of the Regional Seas has undertaken. Based on the recommendation of the workshop, UNEP will proceed with the working group to finalize a core set of indicators for Regional Seas.

http://www.unep.org/regionalseas/globalmeetings/Indicator_RS_meeting/indicator_workshop.asp

5 Future vision

Polar bear on the hunt. © 2011 GRID-Arendal/Peter Prokosch

If Regional Seas didn't exist...

What if there were no Regional Seas? No conventions, action plans, protocols, or regional coordinating bodies?

At one time we thought that "surely it would have to be invented". Today, the answer to this question is more complex.

The East Asian Seas region, for example, needs its coordinating and implementing body, COBSEA, to:

- promote regional cooperation;
- transfer technology, know-how and experience;
- share and manage data and information;
- build technical capacity;
- enhance the role of science in decision making;
- serve as a regional platform for the implementation of marine MEAs;
- develop and implement regional programmes initiated by global organizations such as IMO, IOC-UNESCO, FAO, UN-DOALOS, the GEF, etc.;
- build awareness of marine issues among policy makers and the public;
- serve as a regional forum for environmental and related political dialogue; and
- enhance bi- or tri-lateral programmes between its more developed and less developed Member States.

In the past, the knowledge and experience of the UNEP Regional Seas Programme could and should have fulfilled these needs. Today, we are facing competition (not only in COBSEA, but in most other regions as well) with other organizations that are also able to provide part of these needs to countries. The political, financial, social and environmental situation has changed compared to thirty and forty years ago, when the Regional Seas Programme was established. New challenges have emerged and new thinking is required, about how UNEP's Regional Seas approach can still offer an advantage to countries, compared with its regional competitors. This new thinking should focus on how UNEP together with Member States can adapt to these changes, innovating and transforming the Regional Seas system so that it becomes truly beneficial to the countries of the region.

It is our moral and professional duty to assist developing countries to conserve their marine ecosystems and natural resources and strengthen their coastal communities. In the East Asia Seas,

> *UNEP was created as a global Ministry of Environment, an institution with the means to assist Ministers of Environment – often the weakest spot in governments – in their efforts to mainstream care for the environment in government policy and action, providing them not only with the information and tools they need but also linking them to colleagues abroad in the understanding that environmental problems do not respect borders and that collectively they stand stronger than alone; an organization with the means to support initiatives catalytically until they can stand on their own. I sincerely hope that after the current visioning process is complete, Regional Seas will refocus on its original purpose as supporter and ambassador for the Regional Seas Conventions and Action Plans.*
>
> **– Frits Schlingemann**

> *For Regional Seas as a whole, I think the issue of governance is the most important challenge. If individual programmes will continue to be relevant for their Member States in managing marine areas and resources in a sustainable manner, then the Regional Seas future is safe and sound.*
>
> *The main challenge faced in NOWPAP, which was addressed successfully, has been securing contributions from Member States. In recent years, three out of four members have increased their contributions to the Trust Fund. Unfortunately, this success story has another side: two members hosting the Regional Coordinating Unit (RCU), Japan and Korea, cannot support RCU offices anymore at the same level they agreed on 10 years ago, and therefore the number of RCU staff members will soon be reduced.*
>
> **– Alexander Tkalin**

this can be brought about through a revitalized COBSEA, given adequate political and professional leadership and financial support.

New seas?

What is the potential for Regional Seas to spread to new parts of the world?

The latest successful case was the establishment of NOWPAP, which opened Regional Coordinating Unit offices in 2004 in Toyama (Japan) and Busan (Korea) after years of UNEP-facilitated negotiations. Serious attempts were also made with the North-East Pacific (NEP), which now has a regional Convention – the Antigua Convention – and an Action Plan, but so far lacks a secretariat to make it operational. In some other regions, the Regional Seas system is completely absent or is rather weak.

The countries of those regions need a framework such as UNEP's Regional Seas for the very same reasons COBSEA is needed in the East Asian Seas. Only 'deep ploughing' preparatory work in each of the countries – on both the political and professional levels and with the appropriate national agencies – would result in positive action.

Reaching and dealing with the right ministries is a key step. Another is obtaining financial support, either directly from UNEP or through UNEP's assistance. Without 'speaking to the right people' and external financial support, at least in the early years of the programme, a new plan will not fly… at least not until countries are convinced enough of its benefits to start paying their national contributions.

Seed money

UNEP usually provides seed support to nascent Multilateral Environmental Agreements (MEAs) such as the Regional Seas Conventions and Action Plans, in the expectation that at some point the secretariats will become self-sustained by their Member States. This will, in turn, demonstrate their 'value added' and empower the secretariats to widen their pool of funders. In the context of growing financial challenges and priorities, establishing such programmes in new regions, or even strengthening existing but relatively weak programmes, seems like a very high hurdle.

This cannot be done without fully mobilizing UNEP's firm commitment on one side and the genuine interest and commitment of potential Member States on the other.

If Regional Seas were to disappear tomorrow, a similar but renovated programme would have to be put into place. But what a waste of resources and institutional knowledge that would be! It's a much better idea to build on its 40-year foundation, continue to do what has worked well, learn from our unsuccessful attempts and adapt to new conditions as they arise.

Aerial view of a coral reef in the Caribbean Sea. © Shawn Jackson | Dreamstime.com

Pride and partnership

An interview with Nelson Andrade Colmenares

In 2014, Nelson Andrade Colmenares retired, ending his 18-year participation in the Caribbean Environment Programme and Regional Seas. It's time to take stock of what CEP has accomplished, and what remains to be done.

Q: During your association with Regional Seas, what do you consider your major accomplishments?

A: The Cartagena Convention remained the backbone of CEP activities, and we saw a steady increase in the number of new ratifications of the Convention and its three Protocols, on oil spills, specially-protected areas and wildlife (SPAW Protocol), and land-based sources and activities of marine pollution (LBS Protocol). The latter was a source of particular pride: adopted in 1999, it was the first such protocol designated within the framework of the 1995 Global Programme of Action.

Another accomplishment was our development of strong relationships with governments and ministries, through concrete on-the-ground projects and activities. We also forged partnerships with other international/regional organizations and NGOs, including the European Union, World Bank, IDB, and many others.

Q: Which of the environmental problems you faced did you address most successfully?

A: We encountered a lack of political interest in CEP, reluctant financial support, poor communication of our goals, a general lack of awareness of our work throughout the region. In the last 18 years we managed to turn this around, and today the Caribbean Trust Fund is healthy, our Member States enjoy real ownership of the programme, our resource mobilization plans are structured and solid, we are communicating more effectively with the public through use of social media and awareness-raising efforts.

Most important, we have regained the confidence and engagement of the Convention Parties, primarily because we communicate with them directly and report to them regularly on the implementation of their decisions.

Q: What emerging issues are particularly challenging in the Caribbean?

A: There are so many… but among the most important we would have to include climate change adaptation, especially for Small Island Developing States which are the majority Parties in our Convention.

As always, natural hazards and disasters continue to plague the region, and the ancient problem of pollution continues to worsen, with devastating impact on the ocean environment, coastal populations and natural resources, particularly of islands. Among the newest problems we face is that of microplastics.

Q: What are the biggest challenges to Regional Seas as a whole?

A: Along with all current issues they face, which remain relevant for the next decade, Regional Seas will experience increased competition for minimal resources to the detriment of the oceans – for example sand mining. Other forms of off-shore exploitation for resources such as oil will threaten our marine environment. Responding to the crisis of climate change requires greater action from all stakeholders.

The overarching challenge to be addressed in the coming decade by the Regional Seas Programme is the improvement of ocean governance at all levels. Regional Seas provides a very clear mechanism to bring about the needed changes.

Q: What strategic partnerships have been successful in your region?

A: Almost all actors involved in our marine programme have participated in the Convention and in the implementation of the Caribbean Action Plan. Among the most important have been the entire NGO community – for example, CaMPAM, MPA networks, civil society, development Banks, labs, and regional and international organizations (CRFM, GCFI, IMA, CARPHA, CARICOM, EU). Add to this academia, local communities, political instutitutions, relevant UN bodies and the private sector. The Caribbean environment benefits from the involvement of all of them.

Q: What are the implications for Regional Seas?

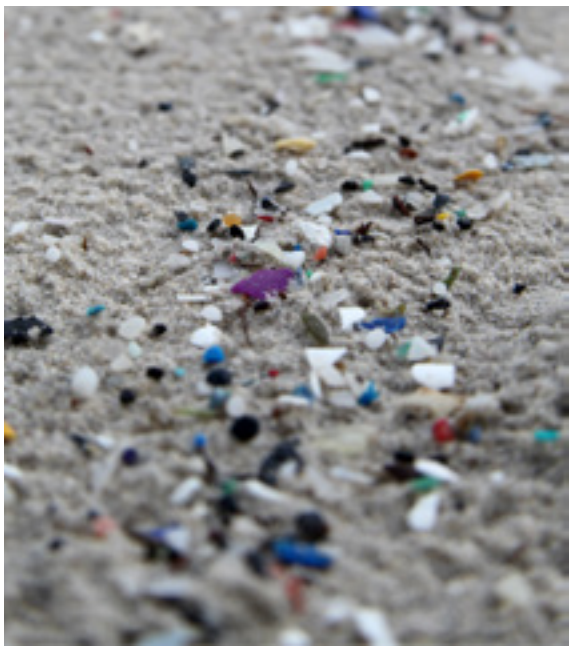
A: I would recommend that the Regional Seas Programme partners with as many sectors as possible. The environment is cross-cutting and affects all of them in some essential way.

The greatest challenge is the continued active engagement of the private sector, but it should be targeted. Of particular importance are the cruise ship industry, oil sector and the hotel sector. They should be linked to specific programmes, projects and activities. Partnerships with the tourism sector should be enhanced, and particular efforts are needed to improve relations with the fisheries sector.

Q: What opportunities do you see for UNEP to contribute to development in the international ocean agenda – for example, the World Ocean Council, Global Partnership for Oceans, Scientific Advisory Groups, etc. – and how will these help you regionally?

A: There is a critical role for the Regional Seas in all of those bodies. While some are more relevant than others, I consider it most important for the Regional

Jamaican volunteers taking part in the 2014 International Coastal Cleanup. © UNEP/CEP



Microplastics on a beach. © UNEP-GPA/Heidi Savelli

Seas Programme to continue to fulfil the mandates established by the Governments in their different Conventions, Protocols and Action Plans and which are further reflected in biennial workplans and budgets. Individual Regional Seas programmes should be and continue to be platforms to address relevant national and global problems and issues at the regional level.

Q: What can Regional Seas do at the international level?

A: It is important for UNEP to contribute more to what the *countries* want – for example, by providing data and information to assist in more informed policy development and decision-making. Such opportunities are offered by the World Ocean Assessment, UNEP Live, Scientific Advisory Groups and technical groups, etc. These are all useful as there are still many environmental data gaps that need to be filled. Relevant and current data and information would assist in regional and national decision making. Partnerships such as the Global Partnership for Oceans (GPO) are also important so that information gained is shared and there is less duplication of efforts.

Q: What do you see as the best way for the Regional Seas Programme to remain relevant as the world community responds to the Rio+20 agenda for oceans?

A: I do believe that the Regional Seas Programme should dedicate more time and emphasis in addressing Small Island Developing States on the issue of climate change adaptation. To remain relevant, the Regional Seas Programme should also consider the following:

- Be relevant and responsive to the needs and priorities of the region.
- Help member states to meet their national priorities/needs through projects and activities.
- Be flexible – we are being asked to function as other bodies function at the international level which we are unable to do given our need to provide support to the countries of the region.
- Ensure that UNEP has a strong voice and presence, and an enabling structure to promote the individual Regional Seas programmes.
- Create enriched and dedicated human resource capacities for Regional Seas in UNEP Headquarters.
- Revive donor resources (e.g., SIDA, Norway).
- Build and attract more resources for oceans.
- Advertise quantifiable success stories to attract more donors at the regional level.
- Increase interactions among the Regional Seas at the functional level and not only at the directorial level.
- Consider the outputs of the SIDS conference and the SDGs in the future agenda of Regional Seas.
- Support countries in their national development agendas.
- Be aware of needs of member states with regards to the protection, management and development of the coastal and marine environment.
- Highlight successful environmental efforts towards educating for sustainable development across Regional Seas programmes over the next decade, such as the Global Universities Partnership on Environment for Sustainability (GUPES), etc. The United Nations Decade of Education for Sustainable Development ends in 2014 and a lot of people are still not aware of the decade's efforts and achievements over the decade.

Q: Do you have a final message for UNEP?

A: The good news from the last 40 years is that it's been a phenomenally productive time. I would ask UNEP Headquarters to be more aware of the work and impact of the Regional Seas programmes at the regional, national and local levels, and their potential for great accomplishment in future.

There is still a lot of work to be done. With continued engagement and cooperation by governments and other stakeholders, like the private sector, we can accomplish even more.

Gentoo penguins on the Antarctic peninsula. © 2010 GRID-Arendal/Peter Prokosch

What now for Regional Seas?

The 40th Anniversary has been a time of reflection for Regional Seas and UNEP on what has been accomplished, but more importantly a time to reflect on what the Regional Seas of the future should be in the next 40 years. During 2014 a vision for the future has been formulated by staff, partners, some Member States and UNEP, as presented above. The next step is to formulate a roadmap and lay the foundation for the next 10 years.

Achieving the vision needs to take into account the emerging Sustainable Development Goals (SDGs) of the international community through the United Nations and the Green Economy approach. The work of the secretariats in supporting the transition to a Green Economy should be linked to the SDGs, and not just to the SDG for oceans. This will ensure that the Green Economy approach has meaning and context within the marine agenda for Regional Seas Member States. It will also make sure that such an approach applies globally and can be used for any region irrespective of its level of development.

> *"The main issue confronting Regional Seas today is whether our 40 year old institutional set-up, primarily developed for monitoring of marine pollution and its effects on marine ecosystems, is capable of responding to all human impacts on coastal and marine environments – including issues related to the impacts of climate change at the strategic regional governance level. In my mind, Regional Seas should progressively evolve to a more and more vibrant marine governance system to meet the expectations of stakeholders at various levels.*
>
> **– Michael Angelides**

There are four key actions needed over the coming years:

- embedding the Green Economy approach in each of the Regional Seas secretariats;
- forming key strategic partnerships;
- strengthening national and regional ocean governance; and
- securing sustainable long-term financing.

As these actions go forward, communicating what has been done, what is being done, what will be done and the impact of these actions will be key to ensuring that Regional Seas Conventions and Action Plans continue to serve their Member States.

> *The ability to implement the Regional Seas 'Visioning Ocean Goals' varies greatly among the 18 regions. In some there is a great gap between planning and achievement. Regional Seas would do well to encourage stronger inter-regional cooperation so that regions with more strength in certain areas could help those less well-equipped to raise their level of implementation. For example, the ROPME region is very close to the Caspian and Red Sea – not just geographically but in terms of our problems and goals – and we would do well to join forces.*
>
> **– Hassan Awad**

> *Regional Seas mechanisms are uniquely positioned to promote dialogue regarding protection of living resources and sharing of benefits in the high seas, which cover 64% of the world's oceans. They play a similar role in many regions with regard to initiatives for the management of large marine ecosystems (LMEs), where Regional Seas have been instrumental in shaping effective processes for more effective governance.*
>
> **– Alessandra Vanzella Khouri**

Mangrove and human activity. © Matthew Potenski (Marine Photobank)

The Green Economy Approach

Embedding the Green Economy approach into the work of the secretariats will help to facilitate the contribution of coasts and ocean to the agenda for ecologically sustainable development. An ecosystem approach for coasts and oceans is tightly linked to a Green Economy, and to the management of natural resources and ecosystem services in the ocean with the potential to deliver many social and economic benefits such as food security and poverty alleviation. Enabling the right fiscal policies through a Green Economy approach at the national level could offer opportunities to address emerging and persistent issues of resource extraction – especially fisheries, gas and oil, and seabed mining, as well as pollution in areas of marine litter and wastewater. A Green Economy approach encourages balance between development and conservation, drawing on the potential to rebuild ecosystems and strengthening social resilience to manage and adapt to the impacts of climate change including ocean acidification.

Strategic partnerships

Focusing on key strategic partnerships can support the Regional Seas secretariats in facilitating the transition to a Green Economy approach. Such partnerships can include key government and regional agencies such as economic commissions, development and finance ministries and economic planning departments as well as the private sector. Experiences in Regional Seas partnerships have highlighted the need to first build trust. A key step in building trust is acknowledging the respective mandates of all parties so that (1) regional actors recognize their role in addressing issues, and (2) regional actions are complementary and avoid duplication. Some of these partnerships should also be developed with regional groups dealing with climate change issues such as disaster risk reduction and adaptation.

Within such a partnership the feasibility of resource efficiencies in disaster risk reduction and adaptation could be studied. Consideration should also be given to linking to regional private sector groups or helping to establish regional nodes for the World Ocean Council. These links are important to further strengthen the relevance of the RSCAPs to Member States in linking environment to the other two pillars of sustainable development.

Regional Seas secretariats already have many partnerships and links with global multilateral

environment agreements (MEAs), regional and institutional agencies with similar mandates. Strengthened partnerships with MEAs will help Member States implement global commitments with regional specificity. The support of Regional Seas Conventions and Action Plans to Member States to move towards a Green Economy approach in their work may require reaching out to new partners at regional and national levels. These new partners could include regional fishery bodies, regional economic organizations, ministries of finance, development, fisheries and climate change as well as technology groups, and think tanks.

Strengthening regional and ocean governance

Supporting and strengthening of regional and national ocean governance that incorporates integrated approaches for ecosystems is needed to support changing to a Green Economy Approach. This may result in legislative and policy reforms within national jurisdictions and possibly revision of regional protocols in light of the Green Economy approaches and ecosystem valuations or formulation of new protocols. Governance of particular sectors will still be needed and supported as noted above, but this should be within an overall integrated system. One window into how this might work is the developing cooperation agreements between regional fishery bodies and Regional Seas as described in Section 3c. Such arrangements with the two partners provides for a more integrated approach to addressing overfishing and in particular stock rebuilding which relies on intact and healthy ecosystems, including water quality and intact habitats – the core business of Regional Seas. At the sector level, strengthened governance can be supported through policies and plans that include Green Economy actions such as reducing carbon footprints and use of low energy technologies.

> *"Regional approaches to management of human impacts on the marine environment have the great advantage of smaller and discrete processes that can come to relatively quick decisions compared to global processes. Contracting Parties within Regional Seas agreements tend to be a bit more homogenous in economic and political outlook and in the capacity to deal with the issues.*
>
> *Above all, the regional approach allows for tailored solutions that match the ecosystems of the sea-basins within the region. These strengths need to be built upon and fitted within the context of developing national and global and cross-sectoral governance systems.*
>
> **– Darius Campbell**

> *"Regional Seas is a unique platform for discussing and tackling environmental issues. It should continue to build on this position, because no other body has the ability to refine regional approaches or address transboundary concerns in the same way.*
>
> **– Dixon Waruinge**

Sustainable long-term financing

Long-term financial planning for environmental actions has been identified as a key ingredient in successful implementation of international, regional and national agreements. By providing a capacity-building framework for Member States to strengthen their ability to support and implement environmental conventions and protocols, such as the Regional Seas Conventions and Action Plans, there will be a significant contribution to their sustainable development and national planning processes. The main focus is on strengthening long-term financing (through innovative financial mechanisms), strategic planning, ensuring enforceable legislation, innovative demonstration projects as well as strengthening overall financial policy frameworks. This will further allow Member States to focus their capacity on developing realistic financing to implement Green Economy policies that are based on resource efficiency, and that value marine and coastal ecosystems as a basis for sustainable development.

Efforts will be needed to support policy changes that ensure there are investments in the actions needed to transition to a Green Economy approach and incorporate these changes in fiscal policies. Sustainable long-term financing means developing – with partners, especially financial institutions – innovative financing as well as incentives to transition to the Green Economy approach, through encouragement of appropriate technologies for fishing and pollution control, and best practices including those for disaster risk reduction and adaptation.

Local people's boat from Anakao, South-West Madagascar, where foreign boats encroach artisanal fishing areas. © GRID-Arendal/Peter Prokosch

From the past to the future
(Stjepan Keckes)

When I attended the 1972 Stockholm Conference, 'environmentalism' was not very fashionable and even less profitable. The Stockholm Declaration was therefore a surprise and an inspiration, and I joined UNEP in 1974 hoping to contribute to the great vision it expressed.

During my 15 years with UNEP I encountered a number of wonderful, earnest and enthusiastic persons who shared this vision. For most of them, working in and around the Regional Seas Programme was much more than a job, it was their life.

The 10 years I spent in Geneva were the best years of my life, professionally and personally, thanks to the team of like-minded and enthusiastic believers in the cause. We were allowed to do what we really liked to do and in what we sincerely believed to be in the interest of the environment. It was a unique situation, and an unparalleled opportunity.

That said, what can I say to a younger generation now in charge of the Regional Seas? They work in a very different world, under considerably changed conditions from those which existed decades ago.

I am the man of the past, they are the future. My experience would be largely irrelevant to them and therefore it would be preposterous for me to tell them what to do. Therefore the only message and advice I can offer them is to do what they truly believe is in the best interest of their constituency.

Contributors

Ellik Adler
Jacqueline Alder
Nelson Andrade Colmenares
Michael Angelides
Hassan Awad
Abou Bamba
Yannick Beaudoin
Mehmet Emin Birpinar
Sálvano Briceño
Darius Campbell
Lucien Chabason
Francis Chopin
Arthur Dahl
Leszek Dybiec
Victor Escobar Paredes
Scott Fowler
Ziad Abu Ghararah
Edgardo Gomez
Ray Griffiths
Rodrigo Guzmán Barros
Ljubomir Jeftic
David Johnson
Stjepan Keckes
Birguy Lamizana
Gaetano Leone
Carl Gustaf Lundin
Gail Lugten
Nina Lysenko
Angelina E.A. Madete
Takehiro Nakamura
David Osborn
Alberto Pacheco Capella
Paul Ress
Julien Rochette
Peter H. Sand
Heidi Savelli
Frits Schlingemann
Paul Siegel
Monika Stankiewicz
Vincent Sweeney
Jerker Tamelander
Alexander Tkalin
Mohamed Tangi
Alessandra Vanzella-Khouri
Saija Vuola
Dixon Waruinge
Helen T. Yap

For more information, contact:

UNEP DEPI
Marine and Coastal Ecosystems Branch
Nairobi, Kenya P.O.Box 30552
Tel: +254 20 762 4591
Fax: +254 20 762 4618
www.unep.org/regionalseas

www.unep.org
United Nations Environment Programme
P.O. Box 30552 - 00100 Nairobi, Kenya
Tel.: +254 20 762 1234
Fax: +254 20 762 3927
e-mail: uneppub@unep.org
www.unep.org