

Harnessing Marine Resources in the Caribbean

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Conceptual Note:

Resources in the area vis a vis marine biodiversity

- Area: the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction; (*Part XI, Section 1, Article 33 of UNCLOS*)
- Resources: all solid, liquid, or gaseous, mineral resources *in situ* in the Area at or beneath the seabed, including polymetallic nodules; when recovered from the Area, are referred to as minerals; (*idem.*)
- Area: seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction (*UNCLOS, Part I, Article 1*)
- Marine Biodiversity: the variability among living organisms from marine sources and other aquatic inter alia ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. (*de Fontaubert et al (1996)*)

About Oceans and Marine Biodiversity in the Americas



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- Source of critical global public services
 - Limited Knowledge (high seas);
 - Food provision Services;
 - Oceans serve as CO₂ sink: contribute to 53% of global sequestration (forests, grasslands, agro-eco-systems and the oceans)

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

Threats to Ocean Biodiversity



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- Threats to sustainability
 - International Shipping
 - Exploitation of Resources (Oil Spills) and overfishing
 - Lack of Adequate Regulatory Frameworks
 - Ocean Pollution and of coastlands
 - Climate Change, loss and degradation of habitat and biodiversity
 - The presence of mangroves (an estimated 3,740,000 hectares) is related to the location of commercial fishers (FAO 2003). The mangrove fishing industry is worth between US\$900 and US \$12400 per hectare (World Rainforest Movement, 2002).



Ecosystem Services affected by the Oil Spill in the Mississippi Delta



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- \$12 - \$47 billion/year. Fisheries, recreation, hurricane surge protection of Delta mangroves
- Market Value of the Delta: \$330 billion- \$1.3 trillion.

Source: Earth Economics/OAS-IABIN



Policy Framework



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- Summits of the Americas Process:

Promote the development or strengthening, as appropriate, of institutional capabilities at the national level or, where specific agreements exist, at the subregional level, especially in land use planning, coastal zone management, coastal engineering, environmental impact assessment, environmental protection and natural resource management laws, hydrography, fisheries and marine affairs management. This should be supported **by promoting the establishment of a marine environment center for the Caribbean and the design and development of model legislation which could serve as the basis for national legislation that would provide an integrated and sustainable approach to the management of coastal and marine resources. Such model legislation should be consistent with relevant international treaties to which states are party and enhance the effectiveness of government policies and programs.**

(Plan of Action for the Sustainable Development of the Americas 1996)



Policy Framework



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- Summits of the Americas Process:

65. *We recognize that the conservation of marine resources and the protection of marine ecosystems, including estuaries and coastal areas, throughout the Americas are vital for the continued economic and social well-being of those who live near or otherwise depend on the sea. We will seek to secure the wider adoption and implementation of existing regional and international marine conservation and marine pollution agreements. We further recognize that the wider Caribbean is a marine area of unique biodiversity and highly fragile ecosystems, and we will continue to work together along with other countries and relevant regional and international development partners to continue to develop and implement regional initiatives to promote the sustainable conservation and management of Caribbean coastal and marine resources. In this regard, we take note of the ongoing efforts to consider the concept of the Caribbean Sea as a Special Area in the context of sustainable development without prejudice to relevant national legislation and international law. (Declaration of Commitment of Port of Spain)*



Policy Framework

- Organization of American States in the context of GA has recognized:

“SIDS deep concerns about the possible threats posed to their economies and maritime environment should a ship transporting substances such as petroleum and potentially dangerous materials, radioactive material, and toxic waste, have an accident or be the target of a terrorist attack while transiting the Caribbean Sea and other sea-lanes of communication in the Hemisphere”

“international obligations of member states, particularly obligations of the states parties to the United Nations Convention on the Law of the Sea and relevant instruments of the International Maritime Organization”

- *(AG/RES. 2485 (XXXIX-O/09) Special Security Concerns of the Small Island States of the Caribbean – adopted at the fourth plenary session of the Organization of American States, held on June 4, 2009)*

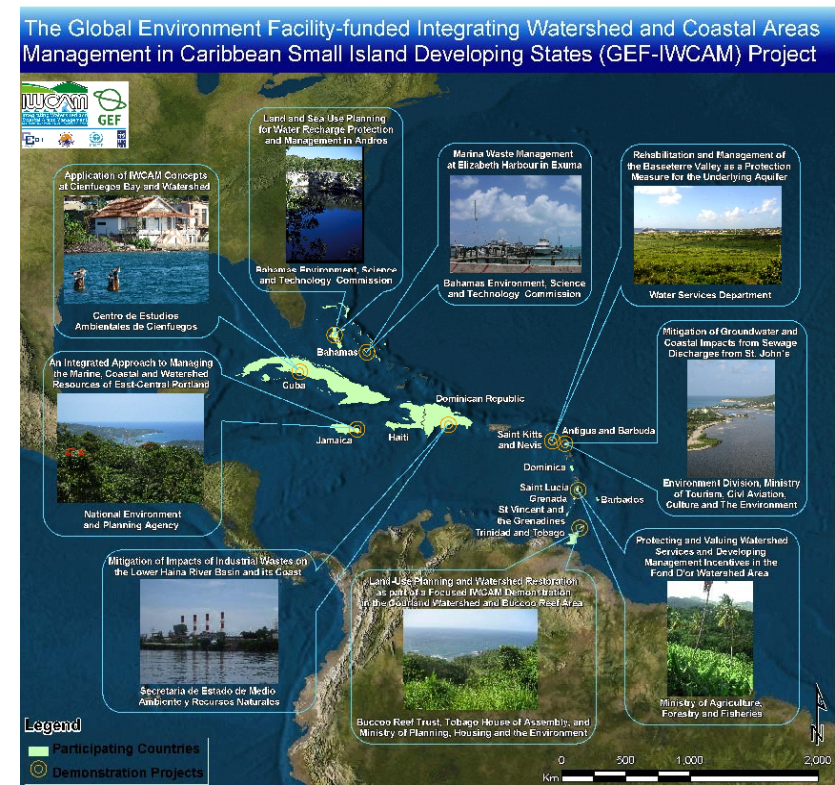
Marine Conservation



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Various Projects in the Region:

- *GEF Funding* – Of the GEF’s 2780 approved projects, a mere 186 of them are designated as focusing on “International waters” (6%), with GEF funding totaling over USD \$1 billion of 9 billion total funding;
- Reducing Pesticides Run-off to the Caribbean Sea (REPCar) – a UNEP project in collaboration with the Global Environment Facility (GEF)
- Integrating Watershed and Coastal Area Management (IWCAM) in the Small Island Developing States (SIDS) of the Caribbean - (value of USD 22 Million)
- *GEF-funded Caribbean Large Marine Ecosystem Project (CLME)*



Conservation and Sustainable Use of Marine Biodiversity



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- *ReefFix -- Case study: Montego Bay Marine Park Trust, Jamaica.*
- Executed by the OAS with support of Government of Chile
- Total benefits from the Montego Bay reefs are US\$401 million Net Present Value (NPV), with an estimated additional potential benefit of US\$70 million NPV through pharmaceutical bioprospecting;
- Up to a 20% increase in coral abundance may be achievable through the use of appropriate policy measures with a present value cost of US\$153 million over 25 years.
- Optimization requires a 13% improvement in coral reef abundance, requiring net expenditures of US\$27 million.
- The expenditures include installation of a sediment trap, waste aeration, installation of a sewage outfall, implementation of improved household solid waste collection, and implementation of economic incentives to improve waste management by the hotel industry.

Montego Bay Marine Park - Jamaica



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Conservation and Sustainable Use of Marine Biodiversity



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- Biodiversity that is of interest to industry for its potential to provide diverse chemicals, enzymes and genes is known as genetic resources.
- Genetic resources yielding potentially valuable products include terrestrial *and marine* microbes, plants, insects, invertebrates, and cartilaginous fishes venomous animals and marine organisms.
- Apart from critical coastal genetic resources, the sea itself yields extraordinary molecular diversity. This often includes resources that contain unusual or highly complex molecular diversity not found in terrestrial organisms.
- The development of marine genetic resources into new commercial products can be a powerful tool for conservation and economic development, and as such, marine genetic resources ought to be incorporated into ICZM planning (*see The World Bank, ICZM of Coral Reefs: Decision Support Modeling, Gustavson, Huber, Ruitenbek 2000*)



Conservation and Sustainable Use of Marine Biodiversity



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- Examples of useful products derived from marine genetic resources include anticancer compounds; antivirals; antibiotics; anti-fungals; anti-inflammatory agents; and hormonal modulators. They have also yielded industrial enzymes such as proteases and collagenases, and are also studied for clues to the development of new agrochemicals.
- Marine genetic resources are also the source of marine biomaterials and of extremely potent toxins, some of which may have applications as anticancer drugs or as diagnostic and research tools. Marine genetic resources are also of interest to the cosmetics industry, and may one day yield new sunscreens and other skin care products.



Conservation and Sustainable Use of Marine Biodiversity



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Bioprospection: is the search for new sources of chemical compounds, genes, proteins, microorganisms and other elements existing in biodiversity that possess real or potential economic value. (Commercial Use of Biodiversity)



US oceanographic research institute Jamaica Expedition:

- deep-sea submersible to collect sponges in 1993.
- Project, approved by the Jamaican government, (Government of Jamaica had issued a collecting permit for this project)
- One of its objectives as the development of new commercial products with pharmaceutical, agrochemical, or other industrial applications.
- There was no mechanism to capture a portion of the value of these marine genetic resources for the source country, other than the obligation to leave taxonomic voucher specimens at the University of the West Indies at Mona (UWI).
- Source: (see *The World Bank, ICZM of Coral Reefs: Decision Support Modeling, Gustavson, Huber, Ruitenbek 2000*)

Conservation and Sustainable Use of Biodiversity: Actions



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INBIO Costa Rica: Agreements with pharmaceutical and Agroindustrial companies

- Bring multiple benefits. 10% of the research budget is destined to Costa Rica conservation areas and 50% of potential royalties will also be destined to conservation areas and development of projects within specific agreed procedures.
- Have given job opportunities to Costa Ricans from different social sectors. transfer of technology as well as training for Costa Ricans, resulted in an improvement of the national technological capability.
- Under the terms of the agreement between INBio and Diversa, two products were developed from substances found in Costa Rican biodiversity: an enzyme for use in cotton manufacture (Cottonase) and a fluorescent protein used as a "marker" for promising chemical compounds.
- The Ministry will use these resources, as stipulated in the INBio-MINAET agreement, to develop information on biodiversity and to support conservation efforts by the National System of Conservation Areas (SINAC).

(Source INBIO Costa Rica)



Sustainable Use/Extractive Initiatives

- The Eastern Caribbean Geothermal Development Project (Geo-Caraibes)
 - Executed by the OAS and the Agence française de Développement (AFD),
 - Two principal development objectives of the Geo-Caraibes Project are:
 - (i) to overcome the barriers to the development of geothermal power and
 - (ii) to implement a regional strategy that will create the conditions for successful deployment of one or more commercially viable geothermal power plants in the region.
This latter objective takes into consideration that geothermal development will progress at different speeds in the three Project countries.
- Example – Dominica Geothermal Project has provided a promising prospect of an electrical interconnection between Dominica and both Guadeloupe and Martinique. If confirmed feasible, it can be replicated for possible exports of geothermal-based electricity from St. Kitts and Nevis and St. Lucia to other islands

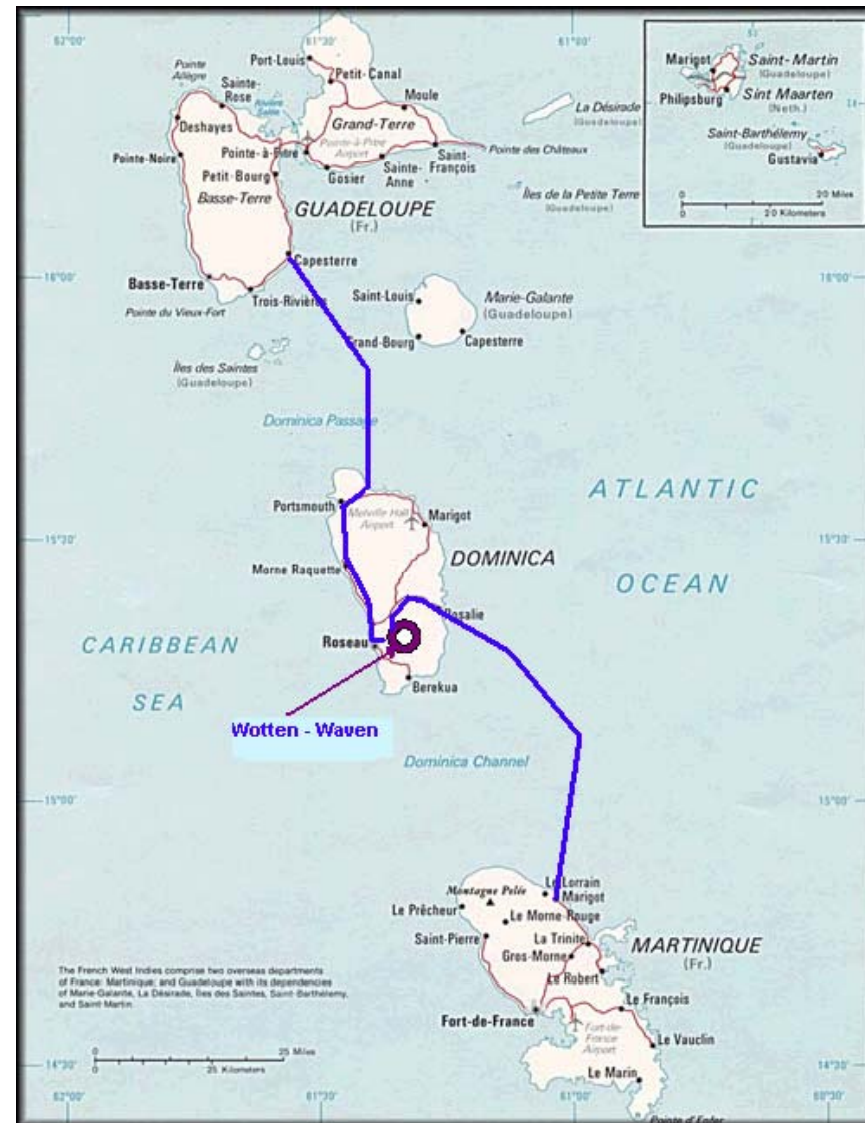


Sustainable Use/Extractive Initiatives



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The Eastern Caribbean
Geothermal
Development Project
(Geo-Caraibes)



International Legal Framework



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- UNCLOS
- Agreement for Implementation of UNCLOS Part XI and ISA regulations;
- *Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena de Indias 1983):*
 - Article 8 - Pollution from Sea-Bed Activities: The Contracting Parties shall take all appropriate measures to prevent, reduce, and control pollution of the Convention area resulting directly or indirectly from exploration and exploitation of the sea-bed and its subsoil.
- *Protocol Concerning Pollution from Land-based Sources and Activities to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region(1999)*
 - Article VII Environmental Impact Assessment -
 - Article IX Transboundary Pollution -
- *Convention on Biological Diversity (1993)*
 - Article One of the Convention describes its three objectives as the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising out of the utilization of genetic resources.

National Legal Framework



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- Environmental Provisions
 - EIA
- Marine and port security
- Mining Laws and Non Metallic Mining Regulations
 - Permitting for Exploratory and exploitation phases



Relevant Principles



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Environmental Law Guidelines and Principles on Shared Natural Resources .

- Principle 2 – In order to ensure effective international cooperation in the field of the environment concerning the conservation and harmonious utilization of natural resources shared by two or more States, States sharing such natural resources should endeavor to conclude bilateral or multilateral agreements between or among themselves in order to secure specific regulation of their conduct.



Relevant Principles



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- *Rio Principles:*
- Environmental measures addressing transboundary or global environmental problems should, as far as possible, be based on an international consensus. (Principle 12)
- In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. (Principle 15)
- States shall provide prior and timely notification and relevant information to potentially affected States on activities that may have a significant adverse transboundary environmental effect and shall consult with those States at an early stage and in good faith. (Principle 19)

Advisory Decision of the Tribunal



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- *IUCN CEL*: Specialist Group on Oceans
- Evolution of Liability
- “the state’s obligations evolve in light of the state of scientific and technological knowledge and the risks of the activity”
- Residual Liability
 - “to avoid gaps in liability, states that sponsor mining operations must bear residual liability for environmental harm that is not otherwise compensated by the party that causes the harm”

Alternative to residual liability could be the establishment of a trust fund

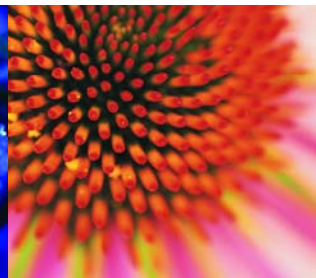


Ideas for Discussion



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1. Adaptation and Cross reference of Economic valuation
2. Consolidation of resources in databases such as IABIN and ISA
3. Incorporate all stakeholders to ensure adequate agreements (participation)
4. Regulate access to genetic resources up-front with permits and contracts;



Ideas for Discussion



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1. Develop prior informed consent procedures;
2. Create a national benefit sharing formula
3. Incorporation of key principles
4. How do we deal with the uncertainty regarding potential impact and limited understanding of marine biodiversity?





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THANK YOU!!!