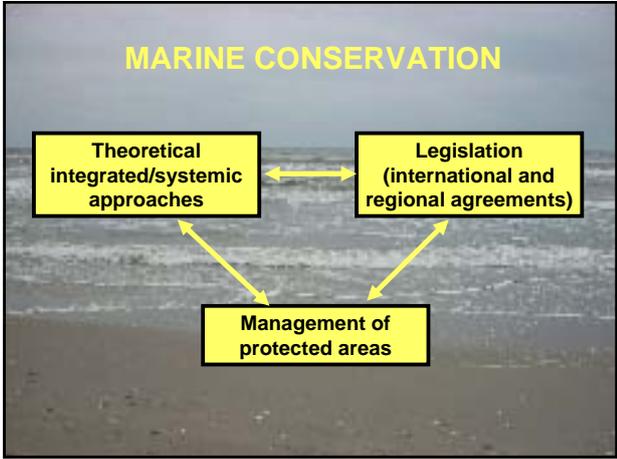


UNDERSTANDING THE MARINE ENVIRONMENT

- **land and ocean are integrally connected**, activities on land are critically linked to marine health.
- the oceans are part of a **closed planetary system**, but have been treated both as a limitless source of natural resources and as a boundless sink for humankind's waste.
- these threats require **wide-ranging, comprehensive, transboundary** responses that incorporate human activities and that treat the entire hydrological cycle as an integrated unit.
- our knowledge of the sea and its life-supporting processes is **very limited**.

Content

1. Understanding the marine environment
2. Theoretical integrated approaches
3. Legislation
4. Management and conservation of marine systems



THEORETICAL INTEGRATED/SYSTEMIC APPROACHES

Several approaches have emerged to deliver **conservation and development** effectively:

1. Bioregional planning

Coordinating the activities of the various government agencies and other institutions charged with coastal zone resource management.

2. Integrated coastal (zone) management

3. Integrated ecosystem management

4. Ecosystem management

Management - *Continuous, interactive, adaptive, participatory process*

THEORETICAL INTEGRATED/SYSTEMIC APPROACHES

All these approaches have several features in common:

(1) They cover a large area

(2) They advocate long-term management

(3) They take an ecosystem-based approach, which treats the land and the sea as a single integrated system

(4) Management practices for sustainability of the productive potential of ecosystem goods and services.

They represent a shift from highly focused short-term sector-by-sector resource assessment and management to larger spatial scale, long-term management aiming sustainability.

TWO EXTREME OPTIONS FOR THE EXPLOITATION OF COASTAL RESOURCES

The commons	Private Property
No management	Adaptive management
Uncontrolled access	Controlled access
Unmanaged free-for-all	Well-managed resource
Declining economic and natural yields	Sustained economic and natural yields

e.g. marine fisheries

MANAGEMENT OPTIONS

EFFICIENCY DRIVEN <i>COMMAND AND CONTROL</i>	ADAPTIVE MANAGEMENT <i>STIMULATIVE ALTERNATIVE METHODS</i>
Assume stability, control change	Accept change, manage for resilience
Predictability, optimal control	Uncertainty, risk spreading, insurance
Managing resources for increased yield	Managing diversity for coping with change
Technological change solves resource scarcities	Adaptive co-management builds resilience
Society and nature separated	Social-ecological co-evolution
<i>Human controlled systems for aquaculture</i>	<i>Catchment based management</i>

Emerging Principles and Concepts

1. Sustainable Development, Integration and Interdependence
2. Inter-Generational and Intra-Generational Equity
3. Responsibility for Transboundary Harm
4. Transparency, Public Participation and Access to Information and Remedies
5. Cooperation, and Common but Differentiated Responsibilities
6. Precaution
7. Prevention
8. "Polluter Pays Principle"
9. Access and Benefit Sharing regarding Natural Resources
10. Common Heritage and Common Concern of Humankind
11. Good Governance

PRINCIPLES FOR SUSTAINABLE GOVERNANCE

1. Responsibility
2. Scale-matching
3. Precaution
4. Adaptive management
5. Full cost allocation
6. Participation

Content

1. Understanding the marine environment

2. Theoretical integrated approaches

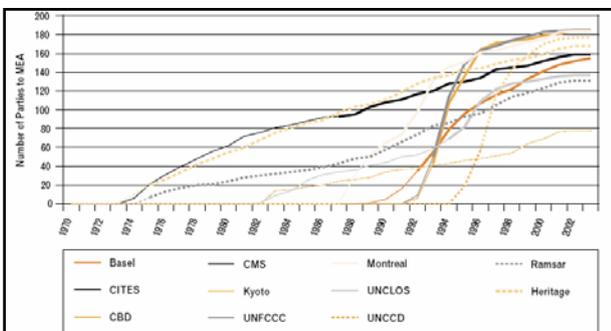
3. Legislation

4. Management and conservation of marine systems

LEGISLATION

There are about 300 treaties that affect the seas. Treaties that provide for protected areas in the marine environment are few. They can be grouped into:

1. Treaties primarily designed to provide for protected areas on land, but can also be applied to marine areas under the jurisdiction of the parties.
2. Treaties that more specifically address the establishment of marine protected areas.
3. International conventions of major importance



Note: Lines turn thick after a treaty enters into force.

Growth in numbers of parties to selected Multilateral Environmental Agreements (MEAs). Over 500 separate MEAs currently exist, even though many—over 300—concern regional issues such as regulation of local fisheries and have a limited set of signatories.

Reducing the risk of oil spills

The development of a "safety culture" based on **positive** (e.g. compensations) or **negative** (e.g. penalties) incentives aimed at creating a safety net. This will drive substandard operators out of the business or cause reform of their practices.



Example of measures

- International Maritime Organization International Safety Management Code Certification regulation.
- The US "zero tolerance" policy to those ships without such certification.
- STCW Code and the "white list".
- Industry refusal to allow membership, or support ships unwilling to convert to higher standards and appropriate safety models.

Limitations of Multilateral Environmental Agreements

1. *Slow negotiation and ratification*
2. *Compromising toward the lowest common denominator*
3. *Lack of monitoring for compliance or performance*
4. *Lack of provisions for enforcement*
5. *Lack of technical and financial resources*

LEGISLATION

1. GENERAL INTERNATIONAL TREATIES

The Wetlands Convention (Ramsar Convention) (signed in 1971)

There are 1634 listed Ramsar sites, covering 145,641,087 hectares of which 48% include the coast and so may contain marine components.

The World Heritage Convention (World Heritage Convention) (signed 1972, ratified 1975)

The World Heritage List contained in 2006 830 sites, of which 162 natural. The Parties can nominate sites within their internal and territorial waters.

LEGISLATION

2. Specific international treaties focused on marine systems

UNEP 's Regional Seas Programme (adopted in 1983, at Cartagena) <http://www.unep.org/regionalseas/>
It started in 1975, in Barcelona, with the Mediterranean Action Plan.

A new direction started by UNEP. It comprises Conventions, Action Plans and Protocols in 13 regional seas plus an additional 5 partner programmes.

LEGISLATION

3. International conventions and initiatives of major importance

1. The United Nations Convention on the Law of the Sea (UNCLOS)

2. The Convention on Biological Diversity (CBD)

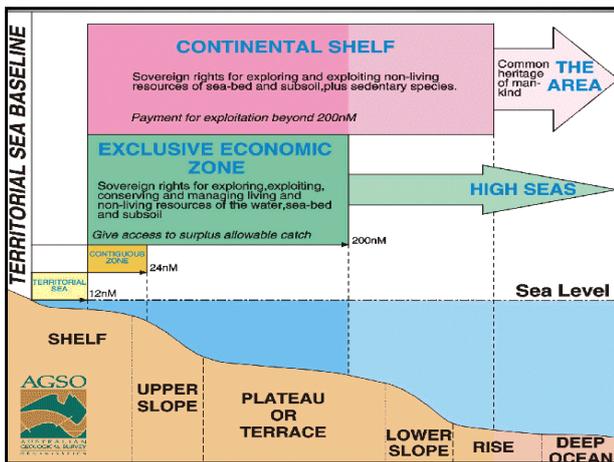
3. FAO Code of Conduct for Responsible Fisheries (adopted in 1995).

THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA (UNCLOS)

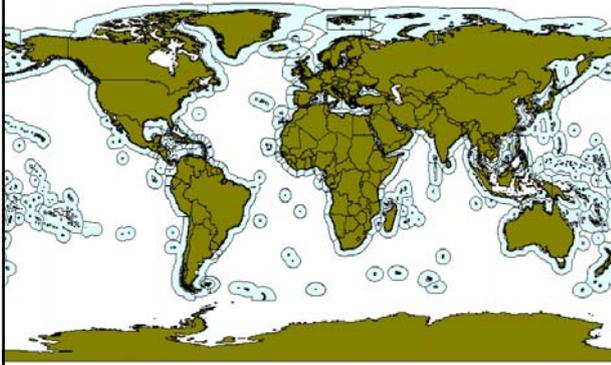
a. It provides rights to coastal areas:

- Territorial jurisdiction out to 12 nautical miles (22.22 km) from the coastal baseline.
- Exclusive Economic Zones (EEZ) up to 200 n.m. (370.4 km).
- Exclusive resources jurisdiction to the edge of the continental margin (up to 350 n.m. from the baseline).

b. Coastal states are obliged to conserve and manage the living marine resources under their jurisdiction.



Exclusive Economic Zones (EEZ)



Marine economic zones and their relative importance

COUNTRY	MARINE ECONOMIC AREA (10 ⁶ KM ²)	LAND AREA (10 ⁶ KM ²)	RATIO OF MARINE ECONOMIC AREA TO LAND AREA
USA	7.6	9.36	0.8
Australia	7.0	7.69	0.9
Indonesia	5.4	1.90	2.9
New Zealand	4.8	0.27	18.0
Canada	4.7	9.98	0.5
Japan	4.5	0.38	12.0
Former Soviet Union	4.4	22.4	0.2

Unwanted effects - UNCLOS Promoting overfishing

1. Many nations augmented their fishing industries to take benefit of the 200 mile EEZ.
2. Nations without sufficient fishing capacity to exploit the resources within their EEZ made them available to other nations against reimbursement led to resource depletion and major stress on coastal communities.

The Convention on Biological Diversity (CBD)

Has three major goals:

1. Conservation of biodiversity
2. Sustainable use of the goods and services provided
3. Equitable sharing of the benefits

The Convention on Biological Diversity (CBD)

- a. The Parties agreed to an *Ocean Declaration*;
- b. The Jakarta Mandate (1995) identified practical steps to apply the convention to marine habitats;
- c. Barbados Programme of Action for the Sustainable Development of Small Island Developing States (1994).

FAO Code of Conduct for Responsible Fisheries (1995)

- It is divided in six thematic articles on fisheries management, fishing operations, aquaculture development, integration of fisheries into coastal areas management, post-harvest practices and trade and fisheries research.
- It is not a legally binding instrument.
- *The clear distinction that used to exist between MPA management and fisheries management is fading and is tends to merge.*

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Management and conservation of marine ecosystems

1. MARINE PROTECTED AREAS
2. BIOSPHERE RESERVES
3. LARGE MARINE ECOSYSTEMS
4. INTERNATIONAL MARITIME ORGANIZATION DESIGNATED AREAS

Protected and management areas

MARINE PROTECTED AREAS

Definition:

An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity and of natural and associated cultural resources, and managed through legal or other effective means.

Goals:

- To protect habitat and biodiversity (*conservation*)
- To help maintain viable fisheries (*development*)

MARINE PROTECTED AREAS

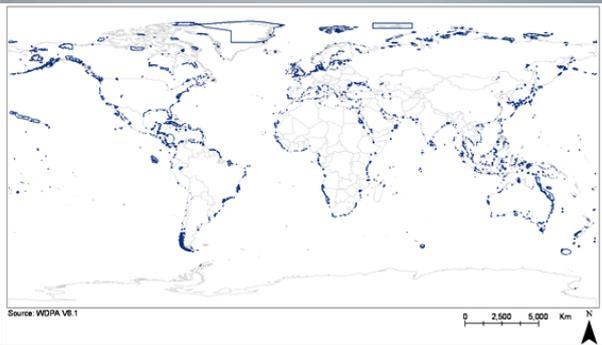
Benefits of marine protected areas:

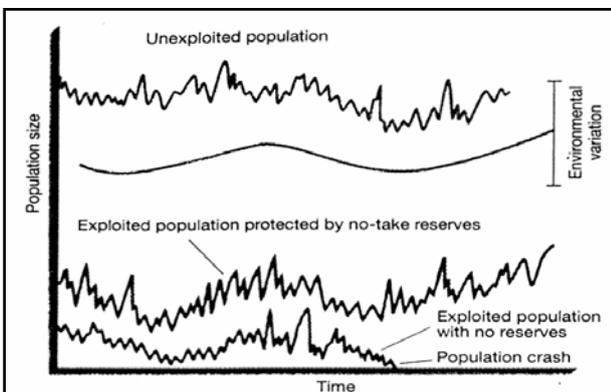
- * Conservation of biodiversity and ecosystems
- * Maintenance of genetic diversity
- * Protection of rare or threatened species and communities
- * Contributions to technology and scientific knowledge
- * Conservation of scientific reference sites
- * Conservation of cultural heritage
- * Educational opportunities
- * Contribution to sustainable tourism
- * Potential contribution to ecosystem-based management of fisheries

Shortcomings of MPA

1. Usually too small (2-8 km² when they should be 30-80 km²).
2. Do not include vital habitats (e.g. seabottom)
3. Important related habitats are often not included.
4. Created in rapidly deteriorating areas
5. Limited resources available (staff, institutional, resources) - paper parks
6. No baseline monitoring done
7. Local communities are not involved

Marine protected areas





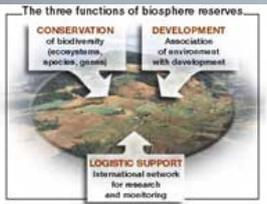
The effect of some environmental variation on an unexploited but protected and exploited but unprotected fish population. Protection can mitigate the effects of environmental fluctuation.

Present state of MPAs

- a. MPAs represent about 1% of the world's oceans.
- b. Effective no-take areas represent only 0.1% of the world's oceans.

Compare to the suggestions that 20% (optimum 30-50%) should be no-take areas, or to the 2010 CBD target of 10%

Biosphere Reserves

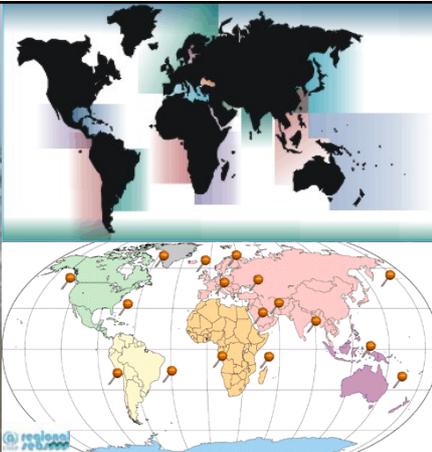


Biosphere reserves have three inter-connected functions:

1. **Conservation:** landscapes, ecosystems, species and genetic variation
2. **Development:** economic and human and culturally adapted
3. **Logistic support:** research, monitoring, environmental education and training

REGIONAL SEAS PROGRAMME UNEP

- Antarctic
- Arctic
- Baltic
- Black Sea
- Caspian
- Eastern Africa
- East Asian Seas
- Mediterranean
- North-East Pacific
- North-West Pacific
- Pacific
- Red Sea and Gulf of Aden
- Persian Gulf and Arabian Sea
- South Asian Seas
- South East Pacific
- Western Africa
- Wider Caribbean

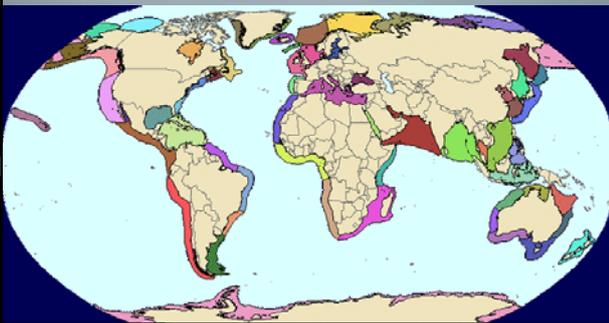


Large Marine Ecosystems

Definition: LMEs are regions of ocean space encompassing coastal areas from river basins and estuaries to the seaward boundary of continental shelves and the seaward margins of coastal current systems. They are relatively large regions characterized by distinct bathymetry, hydrography, productivity, and trophically dependent populations.

Is an ecosystem-based strategy focused on LMEs as principal assessment and management units for coastal ocean resources. There are 64 identified LME.

Large Marine Ecosystems



INTERNATIONAL MARITIME ORGANIZATION DESIGNATED AREAS

For international waters:

1. **Special Areas** (restrictions apply to operational discharges from ships)
2. **Particularly Sensitive Sea Areas** are areas of the seas and oceans that need special protection through action by the International Maritime Organisation because of their ecological, economic, cultural or scientific significance, and their vulnerability to harmful impacts from shipping activities.
3. **Areas to be Avoided** (with respect to vessel traffic)

CONCLUSIONS

- People seldom notice damage to marine systems that would be readily observed on land.
- There is no tradition of managing marine areas for conservation.
- Even now, most of the ocean lies outside the jurisdiction of states.

The progress done so far might not be sufficient to stop the degradation of marine systems!