HISTORY OF OCEAN MANAGEMENT

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ABSTRACT

Elements of present-day sea use management have evolved over a long period. Basic to these are the principles of freedom of the seas, open access to resources, and sectoral management. There is, however, a necessary corrective to this Euro-centric view when the relationships between people and the marine environment are examined in several other cultures. Open access in Western society has experienced more recent restrictions as resource scarcities have arisen and new technological capacities have increased. However, ocean management policies have continued within the spatial framework of freedom of the seas for fishing beyond national jurisdiction and the marine transport sector. The paper traces these aspects historically and also the emergence of new concepts, which have become progressively more multi-disciplinary as inter-sectoral problems have appeared. Similarly, United Nations global policies stand in constrast to the persistence of national sectoral management approaches. It is concluded that very recent developments have now created opportunities for more integrated ocean management to emerge.

INTRODUCTION

The concept of ocean management, in the sense of exercising some form of centralised control over multiple uses of a sea area, is a product of the late 20th Century. It emerged at a time when there was increased concern for the health of the oceans, a greater awareness of the need to allocate national rights over ocean space and resources, requirements to regulate human activities at sea, and the need to resolve inter-territorial conflicts.

Unlike land use management, ocean management is complicated by the fluidity of the medium, its three-dimensional parameters, mobility of many resources and activities, the complexity of interacting ecosystems, and the lack of relevance of administrative boundaries to the natural environment.

Ocean management is also bedevilled by inheritances from the past in custom, law (and lack of it), the perceptions of land-minded administrators, and by powerful global military interests.

What may now be understood by ocean management, if current views are pulled together, is methodology through which sectoral activities (navigation, fishing, mining, dumping, etc.) and environmental quality in a sea area are considered as a whole, and their uses optimised in order to maximise net benefits to a nation, but without prejudicing local socio-economic interests or jeopardising benefits to future generations. This must involve assessments, priorities, allocations and regulations. Overall optimisation of uses in this way is a difficult objective and, it may be asserted, perhaps an unattainable one. An alternative to this and to central management is simply sectoral management within national sea areas, with linking mechanisms capable of resolving inter-sectoral, social welfare, and inter-territorial conflicts as these appear.

Whether a centralised management approach should, or can, be adopted, or merely ad-hoc approaches used, is still open to debate. What is generally agreed, is the need for a policy which has as its foundation the recognition that many activities at sea are inter-connected, and as sea uses increase conflicts arise. The requirement for policies based on the various degrees of functional integration in the marine environment was emphasised in the preamble to the 1982 United Nations Convention on the Law of the Sea, which ... "recognises that the problems and opportunities of ocean space are closely inter-related and need to be considered as a whole"(1).

In a subsequent report of the Secretary General it was stated:

> A fundamental requirement for the development and use of national off-shore marine resources is a national policy that establishes goals, objectives and priorities and lays down basic principles and criteria which provide guidance for the formulation of plans and programmes and a marine development strategy(2).

It is not the purpose of this introductory paper to elaborate on these goals and the ways of achieving them. This will be done by subsequent

contributions. What is intended here, is to consider how we reached the present levels of thinking, and to identify what concepts and practices have been inherited from the past in our current approaches to ocean management.

THE CONCEPTUAL INHERITANCE

Before multiple activities in sea areas can be managed, it is clearly necessary to establish who has the authority for making rules and setting priorities within a specified space, and what the law is with regard to resource ownership and access. In these respects, it is recalled here that some of the basic concepts which enter into present-day discussions and legislation are derived from much earlier periods. The most fundamental of these is the concept of freedom of the sea, and its related systems of coastal state and off-shore user rights.

Attempts to control ocean space and the uses of the sea by maritime powers go back to at least Roman times(3). By far the most ambitious attempt, and never to be surpassed in its magnitude, was the action by Spain after the 1492 voyage which we are now commemorating.

Following the report by Columbus of his explorations, Ferdinand and Isabella were able to secure a Papal Bull from Pope Alexander VI in 1493. This granted to Spain all discoveries lying to the West of a line drawn through a point 100 leagues from any of the Azores or Cape Verdes. No-one was to pass beyond this line, even for fishing, without permission of Spain under pain of excommunication. It should be said that the Marine Geographers Commission would not have awarded any prizes to the Pope for this piece of delimitation, since there is a difference of 8° of longitude between the extremes of the Azores and Cape Verde islands(4).

The positional anomaly was rectified in the following year when Spain and Portugal signed the Treaty of Tordessilas establishing a new line 370 leagues West of the Cape Verdes. This delimitation included a section of what is now Brazil in the Portugese Eastern sector.

The division of the world ocean by Spain and Portugal was studiously ignored by, amongst others, Henry VII of England who, in 1497, sent the

Genoese captain, John Cabot, on his historic voyage north-westward from Bristol to North America. This was an important early lesson in geopolitics, indicating that national claims to sea areas could not be effective unless there was the naval capability to maintain them. Considering the emerging knowledge of the real size of the global ocean in the late 15th Century there was little possibility of comprehensive national controls over fishing or navigation, and this signified the de facto recognition of freedom of the high seas.

These lessons and subsequent events may have influenced the formulation of the concept of freedom of the sea contained in the Grotius Mare Liberum in 1604, and ultimately its de Jure recognition. Grotius not only conceptualised the basic principles of high seas freedoms, but he also identified the rights of nations to exercise jurisdiction over a narrow belt of coastal waters which could be controlled and defended from the shore. In this respect, Clyde Sanger(5) reminds us that later in the early 18th Century Dutch lawyers elaborated further on these themes, and in the process differentiated between off-shore sovereignty and jurisdiction (trusteeship). They argued also over such issues as exclusive fishery zones and the principle of equidistance in delimiting boundaries between opposite coastal states.

Freedom of the sea was challenged by the Englishman John Selden with his counter-advocacy of Mare Clausum in 1635. Selden's arguments (apart from their obvious imperialism) contained a hint of the possibility of depletion of the living resources of the sea. He upheld therefore the right of England to exercise jurisdiction over "English" waters. Selden also, however, gave expression to the rights of innocent passage of ships in what was to become the territorial sea. He did so in more elegant language than that of the 1982 Convention, when he wrote:

> "The offices of humanitie require that entertainment bee given to strangers and that inoffensive passage bee not denied"(6).

Many of the principles debated more than 300 years ago became the orthodoxies of attempts at managing the sea, with Grotius rather than Selden on the ascendancy until very recently.

PAST TECHNOLOGICAL INFLUENCES

When we consider the influences of technology on patterns of sea uses, it should be recalled that the levels of technology in shipping and fishing were relatively stable until the energy revolution of the early 19th Century. Technology until then did little to upset the continued adherence to high seas freedoms. Indeed, the development of submarine cables in the late 1860's reinforced the freedom of the high seas by establishing the right to lay cables, and the 'Challenger' expedition in the 1870's did likewise for research, and incidentally retrieved the first manganese nodules from the deep sea bed.

It was the introduction of steam to the fishing industry in the late 19th Century which marked the beginning of concern over freedom to fish and the common property characteristic of fish stocks. The steam trawler proved a magnificent ship for the job of catching large quantities of fish in waters distant from its home port. By the first decade of the 20th Century, this had given rise to disputes over fishing between, amongst others, Britain, Denmark and Iceland; and the need for stock assessments in the open ocean. The International Council for the Exploration of the Sea (ICES) was founded at this time made up of representatives from eighteen countries in the North Atlantic region.

Before this period, some whale stocks were already under greater pressures than fish in the high seas. They had been hunted for their oil since at least the 12th Century and by the early 18th Century there were land-stations as far North as Spitzbergen for the Arctic whale. Whalers were soon pursuing the sperm whale throughout the Pacific Ocean, and the Antarctic whaling flourished with the introduction of the explosive harpoon and mechanised gun.

For a brief period the whale had some respite with the development of mineral oil as an alternative basis for lighting. In 1885, the first oil tanker came into operation on the world sea lanes, and in 1898 the oil industry moved off-shore in the Gulf of Mexico to depths of 10 metres. For the whale, the respite brought by mineral oil production was only minimal, for in the 1900's other technological changes brought renewed demand for whale oil for the making of soap and margarine.

Whaling illustrates even more than fishing, the problems of open access and the common property nature of marine resources. The companies and whalers engaged in the industry must have known they were destroying the resource. In more recent times, Earling Naess, a Norwegian shipowner who made part of his fortune from whaling, consoled himself to the destruction of the whale with the thought, that ... "If I desisted somebody else would have taken my place"(7), which is the classical expression of the 'tragedy of the commons'.

The power driven ship gave rise also to the first real concerns over intra-sectoral conflict. The consequences of collisions between powerful cargo and passenger ships, which were concentrating in straits and port approaches in increasing numbers, required that rules for vessel behaviour at sea had to be introduced. There was some semblance of sailing instructions even in the 17th Century, this included the rule that "no captain shall take the wind of an admiral", and in the 18th Century a "Rule of the Road" for ships on different tacks existed. However, it was only in 1863 that comprehensive collision regulations were introduced by Britain to govern the use of sea space in order to avoid collisions, but it was not until 1910 that these could be said to have international effect(8).

The turn of the century thus saw some attempts to manage conflicts within the sectors of fishing and of shipping, and to internationalise several of the procedures. Freedom of the sea, however, was still the underlying principle.

CULTURAL PERCEPTIONS

So far this paper has been peculiarly Euro centric in its perceptions, as though freedom of the seas and open access had emerged as universal concepts. This would be to ignore the wealth of knowledge and understanding of the wise use of ocean space held and practiced by communities in other parts of the world - many of whom had cultures with much higher dependencies on marine resources and more intimate social and religious links with the sea.

Societies with possibly the closest relationships with the marine environment, (especially in the pre-European contact period), were those

occupying small oceanic coral islands. Atoll and reef island communities are very dependent on the sea. They are often subject to natural disasters which deplete what little agriculture is possible with poor calcareous soils and variable rainfall. Geologically, oceanic low islands represent the upward growth of coral from submerged volcanoes, consequently beyond the living reefs the outer slopes plunge to vast depths. With no continental shelves and little nutrient run-off from tiny areas of land most food resources are confined to reef margins, passes, flats and lagoons. Offshore deep sea fish are in turn highly migratory and often seasonal in their availability.

Island people readily recognised that the vital resources on which they depended were finite. Their communities survived by evolving rules of social behaviour, ethics, appropriate technologies, resource entitlements and distributional methods which maintained at least long-term balances between the people and the marine environment in a dynamic holistic ecosystem.

One basic feature of many Pacific island societies was limited entry to a fishery. Individual villages had access rights, there was no concept of freedom of island waters, or of a common property resource. In many places these indigeneous reef and lagoon tenure laws still exist. In Palau, Johannes has described community fishing rights as extending seawards to as far as where the islands are barely visible from a canoe(9) and Lucas in 1990 encountered intricate coastal zone rights held by villages in Papua New Guinea(10).

It was customary conservation procedures in parts of the Pacific to have selective temporary closures of sea space; prohibitions on the taking of certain species at specified times; taboos on eating some species types; restrictions on methods of catch to ensure the escape of breeding fish; and the targeting of specific fish amongst a multi-species stock. King (et al) describes how it is taboo in many Fijian villages to catch small sardines in shallows; the belief is the sardines attract the larger carnivorous fish into shallow water where they provide a more substantial catch. He goes on to say that this simple management measure is, in fact, quite sophisticated; fisheries regulations in developed countries are usually by contrast directed

towards protecting the target species itself rather than its ecological relationships(11).

These traditional management systems are frequently characterised by strong linkages between the social and natural environments. Local fishery disputes were often settled by village chiefs or elders, and temporary reallocations of fishery rights made. Lawson and Kwei describe similar systems in West Africa, where chief fishermen and elders settle disputes, impose fines and award damages(12).

Not all indigenous sea management systems are of course useful, and many of the most valuable are lost or are in decay, destroyed primarily under the impact of introduced concepts and technology. Alexander has shown that this exchange impoverished several communities in southern Sri Lanka(13). UNESCO also notes in relation to the resource base, that ... "attempts to replace such traditional resource systems with those based on higher technology and large fossil fuel flows often cause feedback loops to be lost, resulting in resource exploitation rather than resource management"(14). It is only relatively recently that these aspects have been appreciated in western countries.

BASIS OF PRESENT OCEAN MANAGEMENT POLICIES

It was the aftermath of the Second World War that saw greatly increased uses of the sea, and the claims by several coastal states to sovereignty over seaward resources as national property.

Concern about energy supplies led to the Truman Proclamation of 1945. This extended rights to the resources of the sub-soil and seabed of the continental shelf beneath the high seas contiguous to the United States. The limits of exploitation were subsequently taken as the 200 metre isobath, although it was not until the 1950s that drill ships could work these depths.

The sea enclosure movement followed soon after the United States declaration. In 1947 Chile, and shortly other Latin American countries, extended jurisdiction to 200 nm; but the only widely acknowledged curtailments of high seas rights at this time were related to international attempts

to manage whaling activities and the establishment of regional fisheries commissions.

This paper now summarises some of the principal events over the decades since the Truman Proclamation as a basis for understanding inheritances in present-day ocean use management policies.

1950/1960

The decade saw greatly increased catches of fish, as underfished stocks were exploited, and the stern trawler freezer factory vessel brought urban industry to sea. Several states unilaterally extended their jurisdiction over fishing to 12 nm. Also, in 1951, the ICJ upheld the claim by Norway to draw baselines between the outer islands of the coastal archipelago, establishing a precedent for future enclosures of archipelegos.

This was also a time of growth in the world fleet of oil tankers, and increases in the size of the ships, as crude oil cargoes were carried to market oriented refineries in Europe and America. Tank washing took place on return voyages and the oily residue was discharged into the sea. In 1954, the Oilpol Convention was introduced which curtailed tankers from discharging into the sea within 50 miles of the coast, and prohibited this entirely in special areas.

In 1958, the Intergovernmental Maritime Consultative Organisation (to become IMO) was finally established, and in that year the first Law of the Sea Conference was convened. This made several contributions: but neither a uniform breadth of the territorial sea, nor a satisfactory limit to the continental shelf emerged.

Conceptually, there were major advances at this time in fishing management - including the work by Schaefer(15) and Beverton and Holt (16). These established the principle of maximum sustainable yield; while Gordon(17) was an advocate of maximum economic yield and a move towards closure of free access to marine resources. Ocean science also advanced in 1957 with the advent of satellites and the inauguration of the International Geophysical Year.

1960/1970

UNCLOS II took place in 1960 but contributed only in minor ways to ocean management issues. By then, highly technically advanced vessels were fishing harder and longer to maintain catches. The oil industry was expanding in several offshore areas and in 1963, the seabed of the North Sea was divided between the bordering states. With the publication of the study by John Merc the deep seabed was also perceived as an area of profitable mining for manganese nodules, and although prospects were considerably exaggerated at the time new types of ocean mining vessels were designed.

This likewise was a period of considerable conceptual contributions, much of which extended the biological thinking of the previous decade into wider dimensions in a more multi-disciplinary way. In 1962, Rachel Carson's(18) 'Silent Spring' stimulated environmental debate and the inception of more NGOs. In 1965 the LSI was founded at Rhode Island, and bodies such as Pacem in Maribus also emerged internationally, especially after the speach by Arvid Pardo.

In 1967, Pardo made his plea to the United Nations General Assembly for the application of the concept of the Common Heritage of Mankind to the resources of the seabed beyond national jurisdiction. Pardo argued for centralised management of much of the deep ocean, as against laissez faire, or piecemeal enclosure on the basis of technical superiority and defendable claims.

During this period there appeared new schools of legal thinking going beyond 'black letter law". The work by Douglas Johnson(19) focused on biological realities and social criteria in fishing policy. In economics, Christy and Scott(20), amongst others, widened economic analysis beyond strict disciplinary boundaries to include biology and law, and Lewis Alexander(21) published his work 'Offshore Geography of North Western Europe'. This presented in an integrated way the political and economic problems of delimitation and control. Finally, in what was a stimulating intellectual time, Hardin's(22) 'Tragedy of the Commons' appeared, demonstrating the inevitable outcome of permitting open access to a common property resource. These works were well ahead of policy making at

national and international levels, and they were crossing the boundaries of established disciplines into integrated approaches.

It was the pollution from the 'Torrey Canyon' in 1967 which resulted in the greatest public and political pressures, and triggered legislative changes. The resulting 1969 Intervention Convention gave more power to coastal states over vessels on the high seas which were causing pollution. Similarly, the 1970 unilaterally declared "Arctic Waters Pollution Act", which applied to ships within 100 nm of the Canadian Arctic coast, represented action by a coastal state in protection of the environment.

1970/1980

In the early years of this decade divisions between the coastal states and the maritime states became more pronounced with respect to control over resources. In 1972, Iceland extended national fishery limits to 50 nm, and in the same year, Kenya proposed a 200 nm entitlement for coastal states which would give sovereign rights over all economic resources.

The 1972 Stockholm Conference on the Human Environment[23] was an important event, as was the subsequent creation of UNEP and its regional seas programmes. At this time also, the London Dumping Convention was introduced by IMO.

The 1970's Middle East crises had widespread effects. This brought a 200% increase in crude oil prices, and offshore oil development began to take place in waters of over 3000 metres. New drillships were followed by enormous fixed platforms. These were often fabricated in remote coastal areas. The offshore oil industry now commanded vast capital resources. Rigs, platforms, service and support vessels all competed for space at sea and in ports. The impact was considerable and the conflicting aspects difficult to manage with the high priorities being given to oil. The oil crises had also given impetus to the building of tankers of 250 000 DWT and above for the Cape route; and even more oil, possibly amounting to over 1 million tons per annum, was being discharged into the sea through normal ship operations. The IMO MARPOL Convention of 1973 was aimed at eliminating this by technological changes.

The 'Amoco Cadiz' grounding off the Breton coast in 1978 brought about massive pollution and an immediate further extension of coastal state controls, when the French authorities required loaded tankers to report their positions to France and prohibited them from coming within 7 miles of the coast unless destined for a French port, and then only in designated tanker channels.

These events took place during the negotiations of UNCLOS III which had opened in 1973. They influenced the proceedings, especially in relation to pollution of the sea and the management of marine traffic; although strategic considerations were successful in keeping well-established freedoms of navigation.

1980/1990

The early years of this decade was a period of implementation and consolidation of several ocean management measures, although still primarily on a sectoral basis.

The conclusion of UNCLOS III in 1982, although not ratified, legitimised the global extensions of the territorial sea to 12 nm, the 200 nm EEZ, and the jurisdiction over continental margins to as far as 350 nm for wide margin states. The seaward entitlements reduced high seas space by 35%, and brought 90% of commercial fisheries under the sovereignty of coastal states; while the continental margin extensions gave coastal states jurisdiction over almost all offshore hydro-carbon resources and most minerals, with the exception of those of the deep seabed.

The 1982 Convention continued to confirm freedom of the high seas for fishing, and freedom of navigation on the high seas and within EEZs. The Convention also laid down what was regarded as being non-innocent passage in the territorial sea. Non-innocence it made clear, related to the behaviour of ships, and not (by implication) to their structural condition, manning, or the nature of the cargoes (or weapons) they carried. In these respects, the Convention followed the orthodoxies of navigational primacy. On the other hand, the resources of the deep seabed were considered out-with the freedom of the seas and open access. They were declared the common heritage of mankind, with guidelines as to how they were to be

managed under an International Seabed Authority.

In 1982 the principles of port state control, recognised by UNCLOS III, were applied in a Memorandum of Understanding adopted by fourteen countries in North West Europe. The principles were subsequently harmonised with several other states. The objective of the memorandum was to apply the terms of international conventions to all vessels in the memorandum ports, and thus help rid the seas of substandard ships which posed a threat to safety of life and the marine environment. In the early 1980's, there was a more widespread adoption of traffic separation schemes, archipelegic sea lanes and other routing requirements to reduce accidents through the management of marine space.

The early 1980s also saw more resolute management of marine resources under the International Whaling Commission. This was accomplished through increased activities of non-whaling states in the Commission - which ensured the success of the vote for a moratorium on whaling. The same success was achieved with the London Dumping Convention, which through greater participation of states which were not engaged in dumping at sea, was able to extend restrictions to the ocean disposal of radioactive waste. The LDC meeting may have been the first application of the 'precautionary principle' to ocean management. This required that promoters had to prove beforehand that there would be no adverse effects resulting from their proposed activities, rather than objectors proving that there would be.

It should be emphasised that, in relation to whaling and the dumping of radioactive material, the influence of NGOs was very evident. These, along with public awareness of environmental dangers from hazardous substances, increased very substantially during the 1980s. However, it is also interesting to note that the Basle Convention on the "Control Over the Transboundary Movements of Hazardous Wastes and their Disposal" did not interfere with navigational rights under innocent passage principles. Ships carrying hazardous substances are not therefore required to seek coastal state consents to pass through a territorial sea.

The second half of the decade has seen world concepts of political

economy undergoing changes with respect to the environment. It has been demonstrated that the 'labour theory of value', which underpinned environmental perception and resource use in the centrally planned economies, was badly flawed. Natural resources were considered as having low value, since in their initial state they did not embody socially necessary labour. Similarly, in capitalist economies, no real account was taken of the value of environmental inputs which supported fish stock; values were determined for fish by the cost of catching and processing them and by market supply and demand. It was not possible either, for free market forces on their own to deal adequately with the externalities arising from many sectoral activities. As a result, intervention by governments in the form of directives or harmonisation policies gained strength, although often in ad hoc forms and without clear underlying principles.

The 1986 World Commission on Environment and Development(24) helped in these respects; and also focused on many of the inadequacies in sectoral sea use management. It emphasised the needs for wider, more planned integration in space and time. The report showed the vulnerability of coastal ecosystems to inland human activities, and the linkages of offshore living resources to the coastal ecosystem; and stressed the facts of future population growth and distribution in coastal zones. The principle of 'sustainable development' was highlighted by the Commission as a management requirement, and it was adopted by the UN General Assembly. Basically, it meant that economic development was possible if techniques were applied which provided environmental protection, and the use of resources in a sustained way to ensure they could be passed on to future generations.

The global scale of environmental destruction and the future impending crises became more apparent in the latter part of the decade and gave added urgencies to the application of sustainable development to sea uses. Environmental Impact Assessments were by now mandatory requirements with respect to many development projects, and were expected to be as much part of the decision-making process as financial appraisals.

Another recent development is the spatial unification of some EEZs in fisheries management. The EC Common Fishery Policy now extends over the

wide sea areas of North West Europe. The South Pacific Forum states also established elements of fishery management policies. This applies to about 30 million km² of the Pacific within combined fishing zones. UNEP regional seas programmes appear to be moving in these directions, and the process is reinforced by the concept of large marine ecosystems for some ocean management purposes. Use zoning, and the identification and promotion of exclusive marine reserves are further advances in ocean management concepts, but practices are still lagging behind.

The close of the decade has seen little progress in ocean management in the half of the world ocean still considered as high seas. Concern over drift netting and the consequent destruction of marine mammals directly, and by ghost fishing, is perhaps being resolved, but straddling stocks and endangered species are vital issues, as is the question of deep seabed mining entitlements, which remain unresolved, despite the efforts of the Preparatory Commission. It is not clear either if radioactive dumping has been finally removed.

CONCLUSIONS

The history of ocean management is partially the history of control over access to marine space and entitlements to the ownership of marine resources. When ocean space was perceived as plentiful and resources as infinite, management requirements were minimal. The prevailing view was of marine resources as common properties and the sea as free. Ultimately, freedom of the sea became a widespread underlying principle in law and this was reinforced during the ages of imperialism and global naval strategy.

Freedom of the sea started to be curtailed as pressures increased on resources and space, as new independent coastal states emerged, and as technology revealed previously unknown ocean resources - as well as the capacity for resource exploitation to the point of extinction. Large areas then passed under various forms of national jurisdiction. Exclusive economic zones could not, however, solve many of the basic problems of common property resources. New technology in turn, gave rise to new problems. These included major ship accidents, serious operational discharges, overfishing, oil well blow-outs, coastal erosion and species

destruction. Several such events were seen as catastrophic and were the triggers for reactive regulations relating to particular sectors. Government departments implemented the regulations, and with the related industries, tried to manage problems as they arose. In turn, government research bodies provided data and analysis on the basis of sectoral terms of reference.

It was evident as sea activities increased, and inter-sectoral conflicts appeared, that the management of sea uses on a sectoral basis could only be partially successful. The evolution towards integrated management proceeded, particularly in terms of new multi-disciplinary concepts and the activities of NGOs. There were also positive roles on the part of United Nations agencies - although several were bound by restricted areas of competence which did not correspond to the realities of the oceans. It was also apparent that European cultural perceptions made it difficult to learn from the integrating practices of other civilisations which had evolved more balanced relationships with the marine environment.

It can be concluded that over a few decades, in spite of several positive measures, a gulf appeared between new integrated ocean management concepts, United Nations global policies, and national government sectoral attitudes and practices to sea uses. There are now indications that these components are beginning to come together. This has been brought about by a number of more recent events. There are strong pressures by NGOs on governments worldwide to adopt more proactive management in the face of the environmental crisis. Edward Shevardnadze(25) identifies this as the rise of political-ecology and the driving force for the future. The end of East/West conflicts has also changed several of the main strategic factors effecting ocean policies, opening the way for more controls by coastal states. There are now well integrated global networks and developing GIS facilities which will allow planning on a larger scale ecological basis. Governments are becoming increasingly committed in principle to the stewardship of the marine environment on the 'common future' basis. The meeting of UNCED may reinforce these trends.

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