European Topic Centre on Marine and Coastal Environment

ANNUAL SUMMARY REPORT 1996

By

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ETC Leader

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Note

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1. BACKGROUND

The ENEA (National Environment and Energy Agency) CRAM (Marine Environment Research Centre) in Santa Teresa has been appointed the lead organisation of the European Environment Agency's Topic Centre on Marine and Coastal environment. This Topic Centre (ETC/MCE) in 1996 consists of a consortium of four European organisations.

The ENEA, CRAM (IT) provides the Project Leader, Dr Giulio Izzo, for the ETC/MCE consortium, the Forum co-ordinator (Dr Maria Dalla Costa) and a Technical Co-ordinator (Dr Giuseppe Manzella). The consortium consists of the following additional partners:

- Laboratorio Nacional de Engenharia Civil (LNEC, PT) (co-leader)
    - Institute for Coastal and Marine Management (RIKZ, NL) (sub-contractor of LNEC)
- Institut Français pour l'Exploitation de la Mer (IFREMER ,FR)
- Norwegian Institute for Water Research (NIVA, NO)

The Topic Centre has also been in contact and have had meetings with the following organisations

- Food and Agriculture Organization (FAO)
- Joint Group of Experts on the Scientific Aspects of Marine Environment Protection (GESAMP)
- Helsinki Commission (HELCOM)
- International Atomic Energy Agency (IAEA)
- International Commission for the Exploration of the Sea (ICES)
- Intergovernmental Oceanographic Commission (IOC)
- Mediterranean Action Plan (MAP)
- Oslo and Paris Commission (OSPARCOM)
- United Nations Environment Programme (UNEP)
- World Health Organization (WHO)

2. WORK PROGRAMME

Two projects (MW6-7) were identified by the European Environment Agency (EEA) to be undertaken by the ETC/MCE under the 1995 subvention and related technical annex for work in 1996.

2.1. Project MW6 - Improvement of Information on Coastal and Marine Water Quality

The overall role of the EEA is to provide the European Union and Member States with reliable, timely and policy-relevant information on the state of the environment, for policy-making and assessment of the environment, inform the general public, and to provide scientific and technical support to these ends.
This project will determine the nature, organisation and information practices of the monitoring networks relevant to the Marine International Conventions/Organisations to establish how well they meet the EEA requirements in terms of:

- monitoring methodologies
- data management (storage and availability)
- quality control procedures
- data accessibility
- data comparability
- environmental assessment

2.2. Project MW7 - Coastal Zone Pressure and State Indicators

This project will develop and pilot a system of indicators to assess at a pan-European scale the state, pressures and trends of the coastal zone in order to support the definition of an integrated strategy for sustainable development of this area.
This project will also:

- define the limit of the European coastal zone;
- make an inventory of the indicator systems already in use in Europe;
- develop a data base of main European estuaries and coastal lagoons.

3. PROGRESS DURING THEYEAR

3.1. Project MW6 - Improvement of Information on Coastal and Marine Water Quality

This project will determine the nature, organisation and information practices of the monitoring networks relevant to the Marine International Conventions/Organisations to establish how well they meet the EEA requirements

3.1.1. Requirements from EU legislation and EEA - Identified Environmental Issues

The ETC/MCE has prepared a report to be published by the Agency in 1997 on **Integration of information on the marine environment of Europe** which highlighted the following requirements.

- **Requirements from EU legislation and EEA**

Water management is not possible without reliable data upon which to base decisions. Most EU water legislation include obligations to monitor the quality of marine waters and/or activities that may affect water quality. Member States incorporate such requirements into their national or regional monitoring networks.

There is also a need for comparable/compatible data across Europe. The European Environment Agency (EEA) is examining ways in which this data comparability/compatibility can be improved and the Agency will work closely with the European Commission when considering the monitoring implications of the Framework Directive.

Several directives have been introduced into European legislation and policy to protect human health. Many of these refer to monitoring requirements, including reporting about the quality of water in general (marine and freshwater). and, in particular in relation to human functions. Directive 95/337/EC regulates the manner and format in which such data have to be reported. The ETC has produced the following table that provides an overview of European directives connected with the marine and coastal zone and required monitoring parameters relevant to the future Framework Directive.

Table 1. Overview of relevant European directives and required monitoring parameters (based on ENEA, 1995).

Directive	Subject of concern	Parameters
76/160/EEC	on the quality of bathing water	coliforms, thermo tolerant coli bacteria, transparency, pH, faecal streptococces
76/464/EEC	on the pollution caused by certain substances discharged into the aquatic environment of the Community	"umbrella" directive
78/176/EEC	on waste from the titanium dioxide industry	titanium
79/409/EEC	on the conservation of wild birds	list of 161 birds (ca. 40 marine and coastal birds)
79/923/EEC	on the quality required of shellfish waters	salinity, oxygen, pH, temperature, colour, suspended material, hydrocarbons, faecal coliforms, organohalogenated substances, Ag, As, Cd, Hg, Ni, Pb, Zn, saxitoxin
82/176/EEC	on the limit values and quality objectives for mercury discharges by the chlor-alkali electrolysis industry	Hg
82/883/EEC	on procedures for the surveillance and monitoring of environments relating to the titanium dioxide industry	
83/513/EEC	on the limit values and quality objectives for cadmium discharges	Cd
84/156/EEC	on the limit values and quality objectives for mercury discharges by sectors other than the chlor-alkali electrolysis industry	Hg
84/491/EEC	on the limit values and quality objectives for discharges ofhexachloro-cyclohexane	HCH
86/280/EEC	on the limit values and quality objectives for discharges of certain substances included in list 1 of the annex to Directive 76/464/EEC	organohalogenated compounds, organophosphoric compounds, Zn, Cu, Ni, Cr, Pb, Se, As, An, Mb, carbon tetra chloride, DDT, PCP, aldrin, dieldrin, endrin, isodrin, hexachlorobenzene, hexachlorobutadiene, 1.2-dichloroethane, trichloroethylene, trichlorobenzene
91/271/EEC	concerning urban wastewater treatment	BOD, COD, suspended solid, total P, total N
91/676/EEC	on the protection of water against pollution by nitrates from agricultural sources	NO3
92/43/EEC	on the conservation of habitats and wild flora and fauna	list of habitats (50 marine & coastal zone habitats
95/337/EEC	on environmental impact assessment	

- **Requirements derived from identified environmental issues**

Europe's Environment - The Dobris Assessment

The key environmental issues and problems facing Europe's seas identified in the Dobris report (Stanners & Bourdeau 1995) are:

1. Coastal zone pollution
2. Eutrophication
3. Overexploitation of resources
4. The long-term, but potentially very serious, effects of climate change and sea-level rise.

According to the Dobris report the most important pollutants in the marine and coastal zone are synthetic organic compounds, microbial organisms, oil, nutrients, litter and , to a lesser extent, heavy metals and radionuclides.

New environmental assessments and status reports for the entire European area will be prepared for the update of the Dobris Report to be published in 1998 (Dobris+3) underlying these key environmental issues.

Marine Environmental Monitoring Issues

In the Long-Term Programme for Pollution Monitoring and Research in the Mediterranean Sea (MEDPOL) of the United Nations Environment Programme (UNEP), in the Joint Assessment and Monitoring Programme (JAMP) of the Oslo and Paris Commissions and in the Baltic Sea Joint Comprehensive Environmental Action Programme, a number of urgent environmental issues are identified. These can be broadly listed under six categories based on the effects of human activities on the marine environment:

1. Contaminants
2. Nutrients and eutrophication
3. Litter
4. Fisheries
5. Mariculture
6. Habitats and health of ecosystems.

These issues were identified as being important in the assessments of European seas (e.g. NSTF, 1993; UNEP, 1996). New environmental assessments and status reports will be prepared for the maritime areas of HELCOM by 2001, of OSPAR by 2000, and of MAP by 1999. For each region, the issues as listed above will be reviewed and priority will be given to issues which are relevant and important for each region.

3.1.2. Description of the International Conventions/Organisations

The ETC/MCE has investigated the nature, organisation and information practices of the monitoring networks coordinated by the main Regional Marine Commissions/Action Plans acting in Europe. The description of these Commissions and Action plans is presented in the report prepared by ETC/MCE for publication by the Agency in 1997.

On behalf of the Agency, the ETC/MCE organised in Rome in October 1996 the first Inter-Regional Forum where the main European Regional Organisations, active in the field of marine environment protection and monitoring, presented their activities and operative structure. Representatives of the secretariats of the following organisations were invited and took part in the presentations, discussions and planning of further work:

- OSPAR (Oslo and Paris Convention for the Protection of the Marine Environment of the north-east Atlantic, 1992);
- HELCOM (Helsinki Convention for the Protection of the Marine Environment of the Baltic Sea Area, 1974, revised in 1992);
- MAP (Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, 1995);
- BSEP (Bucharest Convention for the protection of the Black Sea, 1992, ratified in 1994);
- AMAP (Arctic Monitoring and Assessment Programme);
- ICES (International Council for Exploration of the Seas)
- IOC- UNESCO (Intergovernmental Oceanographic Commission).

The ETC/MCE has prepared a report on the First Meeting of the Inter-Regional Forum to be published by the Agency in 1997. Among the main results of the Forum the following is highlighted:

There is a need for more relevant data and information to support the European policy for sustainable development. The EEA stressed the need to make environmental information flows as highly effective as possible, and it underlined its role as an information provider to the European Community and consequently of the possibility to put added value to the data and information provided by the regional bodies. An input/output mechanism was envisaged in which, through a strong collaboration between the EEA and the co-ordinating bodies of the Regional Commissions and Action Plans, following a continuous feedback process could provided the necessary information for environmental policy. This mechanism could help the EEA in achieving better reporting which is one of its primary tasks; the delivery, for example, to the European Commission and to the European Parliament of the "Dobris+3" Report and of the EU98 State of Environment Report, will help in the preparation of the sixth Environmental Action Programme. The collaboration with the main regional organisations will allow the EEA to assess the trends and priority problems areas, to which particular attention must be given.

3.1.3. Sampling and Monitoring Methodologies

All the Conventions derive their founding principles from the UN Conference on the Human Environment held in Stockholm in 1972, where a 'master plan' for the protection of the world environment was developed.

The ETC/MCE highlighted in its Report on the Regional Conventions that the marine European Conventions/Organisations presently adopt different monitoring strategies in relation to the same environmental issues. These strategies are the result of agreements reached in specific meetings of advisory groups and technical bodies under these Conventions. Experience demonstrates that the extent of monitoring is contingent on priorities, capabilities and capacities at national and sub-regional levels. This is true in particular for the Mediterranean region where countries at significantly different stages of development participate in the MAP programme, but it is also found in Northern European countries. Barriers to the harmonisation of monitoring are mainly at the sampling stage for most of the environmental issues and at a wider level for "Eutrophication", since this process is not generally agreed upon in either definition or effects. The ETC's role in this area is to help reach a consensus on the technical development necessary for the harmonisation of monitoring activities.

3.1.4. Data Management (Storage and Availability)

The ETC/MCE identified the topic of data management as an important task to be developed for achieving the efficient flow of data between the Conventions and EEA, and it produced a draft report under the title **"Data Management and Quality Assurance"** with a preliminary study of data management practices of main regional organisations, and harmonisation requirements. Further development of this task will be made during 1997. Furthermore, the ETC produced the report on "**Data Availability and Access"** with an inventory of available data.

The MAP data management, and particularly the MED POL data, is handled at the MAP co-ordinating Unit in Athens. The main part of data collected under the OSPAR Convention is stored in the International Council for the Exploration of the Sea (ICES) database in Copenhagen. The rest of data are collected from documents sent by contracting parties and stored on PCs by the OSPARCOM Secretariat in London. The data collected by HELCOM are managed by the Finnish Environment Institute in Helsinki. Little information is available on the quality assurance of the data management, compared to the information usually available on the quality assurance of the data itself. A real harmonisation to meet the EEA requirements would require the building of a European database with harmonised procedures for various aspects from the definition of European water quality standards through common sampling and analysis protocols to data management.

The data set that the ETC/MCE has identified at European level are presented in Table 2.

Table 2. Data available at the European level (Regional Conventions and Action Plans for EU regional seas).

			HELCOM	***MAP***	***OSPARCOM***
	temperature		x	x	x
	salinity		x	x	x
	pH		x	x	x
	oxygen		x	x	x
	alkalinity		x	x	x
	tot.P		x	x	x
	phosphate		x	x	x
Hydrochemical	tot.N		x	x	x
variables	nitr./amm.		x	x	x
	silicate		x	x	x
	heavy met.				
		Cd/Hg/Pb	x	x	x
		Cu/Zn	x	x	x
	tot.Sn/TBT		x	x	x
	Petr.HC		x	x	x
		PAH	x	x	x
	Chl. HC				
		DDT/PCB	x	x	x
		HCB/HCH	x	x	x
	dioxin	PCDD/Fs		x	x
	toxaphener	PCCs			x
	bromin.biph.				
	biph.ethers				x
	chl. naphtal.				x
		chlordanes/	x	x	x
	phytopl.				
		prim.prod.	x		x
		chl.a/pigm.	x	x	x
		spes.comp.	x		x
		no/biomass	x		x
	zoopl.				
		spes.comp.	x		x
Biota		transport	x		
		abund./biomass			x
	macrozoob.				
		biomass			x
		spes.comp.			x
	soft bottom				
		spes.comp.	x		x
		abund.biomass	x		x
	microorg.				
		totno./biomass	x	x	x
		microb.activity		x	x
	phytobenthos				
		spes.comp.			x
		biomass			x
		comm.function			
	fish				
		fish diseases			x
		fishery activities			x
	sea mammals				
	Enzyme meth.				
Biological Effects	Physiol.Meth.				
	Bioassays				

3.1.5. Quality Control Procedures

In its report describing the Regional Conventions, the ETC/MCE also described the data quality assurance procedures adopted by these bodies and highlighted that the data quality control procedures are developed in all the main organisations under the direction of expert advisory groups. ICES acts as advisor for OSPARCOM and HELCOM and IAEA-MEL for MAP. These procedures do not appear to be an obstacle to the harmonisation since they are developed in all the Regional Conventions. A common European quality control procedure could relatively easy to be agreed upon at international level since both advisory bodies adopt international standards protocols. A common European database could then be used containing data checked at the national and regional levels through these common protocols. The ETC/MCE will encourage the adoption of this common data quality procedure.

3.1.6. Data Accessibility

In its report on data availability, the ETC also considered the accessibility of data. Data accessibility, in principle, should not present major obstacles. Nevertheless, there are still two technical obstacles: there is a two year delay in the delivery of national monitoring data to the regional data collection centres and the conventions are not disposed to provide access to their raw data. These bodies declared in the Forum meeting they will only submit assessed and aggregated data after these have been published in Regional or National Quality Status Reports. Another difficulty is that the reporting of the Conventions is scheduled every five years (different five year reporting period for each of the Conventions) while the EEA is currently scheduled every three. The EEA, together with the Commission and the Contracting Parties, should consider how to remove these obstacles, at least for a defined group of mandatory parameters.

3.1.7. Data Comparability

The EEA is the European body responsible for the comprehensive environmental assessment of the European marine and coastal zone. A new information system needs to be developed through which the ETC/MCE, on behalf of EEA, could supply the EIONET with structural environmental information. Restricted supply of information and inconsistency of the data between the marine conventions although focus on regional and sub-regional environmental issues, it misses the overall objective of European marine environmental policy. The regional conventions/organisations produce Quality Status Reports in which the assessment of the regions of their respective competence is presented. They declared their ability to fulfil the EEA requirements with information mainly in the form of these Regional Assessment Reports. However this is not sufficient for the EEA information requirements since they do not satisfy the necessity to produce an integrated assessment of the European marine environment and thus could create duplicates of the regional reports. The objective to produce an integrated assessment in the European Seas must be based on data deriving from common agreed monitoring procedures, criteria, assessment tools, etc. A common agreement on how to achieve this goal should be reached between the EEA and the European Regional marine organisations.

A first attempt for harmonisation was made at the first meeting of the Inter-Regional Forum. It was agreed that in order to exchange information and to achieve common grounds on technical-scientific issues it is important to establish a dialogue between regions on:

- Monitoring requirements
- Design strategy and requirements
- Sampling protocols (Guidelines)
- Quality control procedures
- Data handling
- Procedures to access data banks

Data accessibility is a short-term issue between the EEA the Marine Conventions and the Member States and could be addressed at a policy level. On the other hand comparability of the data is a longer term issue mainly for national experts at a more technical level.
The problem is far from being solved because a general agreement has to be reached among the EEA and the Regional Conventions pertaining to the regulation of these matters.
A possible role for the ETC/MCE in the field of the marine and coastal environment could thus be envisaged as follows on short (*) and longer term (**) proposals:

- work on topics/procedures such as: development of strategies, guidelines, assessment tools and techniques (*) to be used by the relevant Regional Conventions;
- provide information to Conventions which is not delivered by European countries (*);
- harmonisation of existing monitoring programmes in the Regional Seas (**);
- building of common data sets for all the Regional Seas (**);
- harmonisation of the production of assessment reports at European level (**).

3.1.8. Integration of Information

The ETC/MCE has produced a report on the integration of information on the marine environment of Europe and a report on indicators where it was emphasised that the integration of information is a very delicate matter since wide political and technical agreement on water quality standards is necessary. It is the real starting point for any harmonisation required at the European level. The current EU directives do not provide the basis to meet this common goal on data comparability. The two main proposals/approaches analysed by the ETC to meet this challenge are the following:

- The future Framework Directive dealing with the ecological quality of water is a concrete proposal towards harmonisation of water quality standards. Ecological Quality (EcoQ) approach - Ecological quality of surface water is an overall expression of the structure and function of aquatic systems, taking into account the biological community and natural physiographic, geographical and climatic factors as well as physical and chemical conditions, including also those resulting from human activities.

- The DPSIR approach (Driving Forces-Pressure-State-Impact-Response and use of Environmental Indicators) - The system of environmental indicators is a set of environmental variables that are quantitative descriptors of the driving forces, the state, the pressure, the impact and the response of both the natural and the socio-

economic system. They may be structured in a matrix according to a thematic approach in which the themes are represented by the identified environmental threats.

These two approaches differ from each other in the set of parameters to be monitored and in the final interpretation of the results. The first has as reference the improvement of the ecological quality objective of a certain water body (to be defined through the knowledge of the ecosystem). The second has as reference the specific threats and their reduction in terms of effects on the ecosystem and on human health and welfare. The two approaches could be harmonised. In practice, the first stresses the importance of the environment and proposes to define a specific threshold of quality which is included also, although in a different form, in the DPSIR approach through the definition of reference and target values for each indicator.
The information needed to meet the requirement of the EcoQ covers the needs of the DPSIR approach but is more demanding and involves also a stronger development of underlying research. It cannot be forgotten that the Convention for the Protection of Biodiversity, in which Marine Biodiversity is considered (UNCED, Rio 1992), also needs an improvement of research, at least to develop and define European standards for biodiversity inventory and protection in terms of monitoring of negative trends.
The integration of information needs a careful discussion and should certainly be addressed in the future Inter-Regional Forum meetings.

3.1.9. Conclusions

The ETC/MCE has progressed in the MW6 project under 1995 subvention. The main improvements can be summarised as follows:

- The First Interregional Forum (Rome, October 1996) brought together with the EEA all the main European regional organisations/conventions operating in the protection and monitoring of the marine and coastal environment to debate common problems and strategies. They agreed on the need for an European level assessment of the maritime area and highlighted the existing difficulties and gaps, and the desire to overcome them. The next Forum meeting (October 1997) will deal in a more specific way with some of the points raised in the 1996 Forum.

- The analysis of the sampling and monitoring strategies emphasised the existing gaps at the national level in the spatial coverage and time frequencies in the respective programmes. The MEDPOL programme in particular shows the difficulties arising due to the existing technical imbalance in capacity in the Mediterranean area and the funding limitations to fulfil this gap in a short time. In 1997, the ETC will prepare a report, to be published in 1998, on the Mediterranean sea to emphasise which information is available and which is lacking but needed, to assess effectively the state of the marine environment.

- Data management and analytical quality control procedures do not appear to be the limiting factor to the harmonisation and the flow of information to EEA, although a common standardisation is required. The data accessibility meet political obstacles at the regional level that should be removed through an agreement among the Regional Conventions the Member States and EEA. For 1997, ETC is preparing some products (indicators and data

management proposals) that appear to be useful assessment tools for the Conventions and are a contribution for a better co-operation with them.

- Data comparability and integration of information are the major problems to harmonisation because of the different sampling strategies within the regional conventions. The ETC will encourage a harmonisation of monitoring and sampling protocols. Common assessment tools are also needed, linked with the requirements of the national monitoring programmes, in order to develop common criteria and to achieve comparable judgement. This will be dealt with by the ETC/MCE in 1997 and proposed as an important item in the next Forum agenda.

- One of the tasks of the ETC/MCE is the proposal for a selection of a high quality dataset to be used in the process of testing the indicator system for the marine and coastal environment at the European level. The difficulties in achieving this task in a short time derive from the above mentioned obstacles in data access. The identified solution is carrying out the testing with national data provided by the partners of the ETC consortium and, in the meantime, stimulating the Conventions or the member states not participating in the consortium to provide their own data. Major co-operation and a general agreement is necessary among the environmental bodies operating in Europe to define the data set required to make a European level assessment. This is not impossible but still far to be reached. Table 3 presents the common parameters in the three main Organisations.

Table 3. The common parameters reported in the main three Conventions. Mediterranean Action Plan (MAP) parameters with an asterisk (*) are mandatory.

MAP	*OSPARCOM*	*HELCOM*
(*) Total Hg and Cd in organisms and sediments	Hg, Cd and Pb in organisms	Total Hg, Cd and Pb in organisms
(*) Chlorinated HC in organisms and sediments (DDT/PCB)	Chlorinated HC in organisms and sediments (DDT/PCB)	Chlorinated HC in organisms (DDT/PCB)
(*) Microbiology (biomass)	Microbiology (biomass)	Microbiology (biomass)
temperature	temperature	temperature
salinity	salinity	salinity
pH	pH	pH
oxygen	oxygen	oxygen
alkalinity	alkalinity	alkalinity
nutrients	nutrients	nutrients
silicate	silicate	silicate
phytoplankton(chlorophyll-a)	phytoplankton(species, chlorophyll-a & primary production)	phytoplankton(species chlorophyll-a & primary production)
zooplankton	zooplankton	zooplankton
Microbiology (biomass)	Microbiology (biomass)	Microbiology (biomass)
Radionuclides	Radionuclides	
PAHs (in organisms)	PAHs (in water, organisms and suspended matter)	PAHs (in organisms)

The actual situation does not allow a harmonised assessment at the European level. The sub-regional and regional quality status and assessment reports appear to be the only available information sources to be used for the EEA purposes; in particular for the Dobris+3 assessment report. Probably, these data sources will satisfy the guidelines for data collection of the report. For further assessment, the system of indicators the ETC is developing, must be tested.

3.2 Project MW7 - Coastal Zone Pressures and State Indicators

The overall objective of this project is to identify the major pressures on the coastal zone and to develop and pilot an appropriate system of indicators to characterise the pressures and the resulting state of the coastal zone.

3.2.1. Definition of European Coastal Zone

The coastal zone of Europe has been defined by the ETC/MCZ as follows:

Sea boundary

The 12 nautical miles line, limit of the territorial waters. It is a criteria of general use and internationally recognised (UN Convention for Law of the Sea). It covers the area where activities connected with land proximity take place, and where the majority of the effects of the land vicinity and activities performed there also have an influence. At the same time, it is sufficiently narrow to make its monitoring feasible.

Land boundary

As a general operational criteria, the land boundary is a line 10 km away from the coast line (defined as the limit of High Water at Spring Tides). This 10 km wide stripe covers the relevant influences of the sea on morphology, ecology and human activities. The choice of the 10 km line is also justified as this strip will cover most of the large coastal cities and economic activities connected with the coast.

In the same definition it is also proposed to consider as part of the coastal zone:
The aquatic bodies which, at any time, have a contact with the sea (estuaries, coastal lagoons, fjords, *rias* and deltas) up to the limit of tidal propagation.
Typical formations of the coast, such as dune fields and wetlands (e.g. salt marshes) until the limit of salt intrusion if this limit is wider than the 10 km line limit.
Low lands, which would be flooded if no coastal defences were in place.
The 10 km line follows not only the coast line itself but also the contour of the water bodies previously mentioned.
The 12 mile sea boundary and the 10 km landward boundary are compatible with the OECD/EUROSTAT questionnaire (OECD, EUROSTAT, 1996).

3.2.2. The Need for a System of Indicators

A system of indicators is needed for:

> *the production of information relevant to European coastal zone policy and the development of a system of indicators which can be used to assess the state of the coastal zones and pressures on them.*

Indicators are a tool for reporting and communicating with policy makers and the general public on environmental assessment in terms of state and pressures deriving from human activities and affecting the environment.

The task to produce policy-relevant information is the main aim of the EEA reporting system (e.g. The Dobris assessment) and therefore the role of a system of indicators for the coastal zone should be consistent with the aims of the Dobris report.

3.2.3. Inventory of Different Systems of Indicators - the Adopted Methodology

The ETC/MCE analysed the different systems and sets of indicators in use at national levels starting from the most thoroughly debated systems; that is, the "*pressure-state-response*" (PSR) proposed by OECD (1993). This conceptual framework is useful due to its simplicity and wide acceptance, and the fact that it can be applied on any scale. Modifications of the OECD-PSR system resulted in alternative systems, e.g. the PSR/Effects model of the US Environmental Protection Agency (US EPA) (EPA, 1994), the PS/Impact/R model of the UNEP (Swart *et al*, 1995) and the DPSIR model introduced by the RIVM in 1995 and adopted by the EEA (Wieringa, 1996).

All these systems of indicators, although derived from the OECD approach, give different definitions of pressures, state, indicators, etc. The system proposed by the ETC/MCE although started from the OECD PSR definitions, adopt finally the DPSIR model used by the EEA for other themes.

3.2.4. Criteria for the Selection of Indicators

The ETC/MCE has developed a set of criteria that should be respected by the proposed indicators:

A. Relevance to the coastal zone

- indicators should be responsive to changes in environmental conditions (biological, geo-physical and/or chemical) in the coastal zone related to human activity;
- they should relate to functional concepts (ecosystem: food-web relations; human risk: safety);
- the total list of indicators should be representative of the characteristics of the coastal zone;
- the indicators should not overlap the state, pressure and impact categories;

B. Relevance to European policy

- indicators should show response elasticity (how easily could a decision-maker respond/reduce a particular pressure to improve the state and/or reduce the impact);

- they should concern transboundary aspects (relating to human activities, pressures, states or impacts) within Europe;
- they should provide a basis for international comparisons on a European level;
- they should be simple and easy to interpret;

C. Measurability / data availability

- the data required to support the indicator should be measurable and should be readily available, or potentially so, at a reasonable cost/benefit level;
- the data required to support the indicator should be adequately documented and of known quality;
- the data required to support the indicator should be updated at regular intervals in accordance with reliable (and comparable) procedures;
- they should be capable of revealing trends over time (in the past and in the future);

D. Exclusion of natural fluctuations

- there should be a threshold or reference value against which indicators can be compared so that users are able to assess the significance of values associated with them;

E. Spatial aggregation

- it should be possible to aggregate an indicator over space and time;

F. General

- indicators should be well-founded in technical and scientific theory;
- they should lend themselves to linkage with economic models, forecasting and information models in a general way.

3.2.5. Proposal for a System of Indicators to be Applied at European Level

During the ETC/MCE workshop on "Indicators for the coastal zone characterisation and management" (Lisbon, November 1996), the possibility was discussed of creating a table providing an overview on indicators to characterise the coastal zone based on the causal DPSIR chain.
Three main tables were presented in the ETC Report to be published by the Agency in 1997 in which all the relevant indicators for the coastal zone were listed. A Summary of this Report is shown on Table 4.

A selection could be made from these indicators by testing them against all the criteria mentioned above.
The development and the test of indicators will depend on data availability and the potential for spatial aggregation. Spatial aggregation can vary for each of the different issues and for the pressure, state and impact indicators. Parameters concerning water quality can have different boundaries from those parameters concerning the terrestrial characteristics. This aspect needs further development in the next phase of the project. Once data availability and spatial aggregation are known, the methodology for calculating each individual indicator can be defined.

3.2.6. Structure of a Database of Main European Estuaries and Coastal Lagoons

The estuaries and coastal lagoons are particular water bodies very sensitive to pressures from human activities. They are at the same time buffer systems for the effects of the marine environment into land ecosystems. Following a DGXI request, a data base of main European estuaries and coastal lagoons is being developed by the ETC/MCE. The general structure of the database has been proposed in an ETC Report to be published in 1997. In the future work of the ETC it is expected to start with data collection for the data base, but this must be agreed upon and put in future ETC workplan.

Table 4. Overview of issues with pressure and state indicators

Environmental issues	**Human activities (Driving Forces)**	**Pressure on coastal zone** **Pressure indicators**	**State of coastal zone** **State indicators**
eutrophication	agriculture, urbanisation, fishery & shell fisheries, mariculture	loads tonnes N + P / year entering sea (river, dredged material, coastal zone point sources, air, diffuse)	total concentration (mg/l) P, N in water in winter season- identification of blooms
heavy metal pollution	industry, urbanisation, harbour activities (dredging & dumping)	loads of heavy metals (Pb, Cd, Hg) (river, coastal zone point sources, air, diffuse) tonnes heavy metal / year entering coastal zone	concentration heavy metals (Pb, Cd, Hg) in sediment
overfishing	fishery & shell fishery, mariculture	sum of HP-capacity of fishing vessels	fishing mortality
depletion groundwater	tourism & recreation, urbanisation, agriculture	ground water abstracted in the coastal zone	sustainable use of groundwater
coastal erosion	mining, harbour activities (dredging & dumping), coastal protection	recession of shore in m/year	land loss in m^2/year
climate change	energy conversion, industry, transport & shipping, urbanisation, tourism & recreation	relative sea level rise	land under flooding risk
habitat loss	mining, harbours activities (dredging & dumping), tourism & recreation, fishery & shell fishery, coastal zone protection, agriculture, mariculture	land use/marine function in coastal zone	loss of priority habitats

3.2.7. Conclusions

According to the needs of the Agency Work Programme and the relevant tasks carried out in 1996 the following results have been achieved:

- A study of the DPSIR approach with an inventory of the system of indicators already in use has been carried out.
- A set of criteria to be respected by a system of indicators to be applied at European level has been proposed.
- A new list of indicators relevant for coastal zone management has been developed.
- The structure of a database for the characterisation of the most important European estuaries and coastal lagoons has been developed and proposed.

In 1997, the ETC/MCE will apply the set of indicators to test their effectiveness to produce thematic maps representing the state and pressures of the European coastal zone.

4. AD HOC SUPPORT ACTIVITIES

Information on mercury pollution in the Mediterranean was provided to the Institute for Nature Conservation Research, Tel Aviv University;
Information on limit values for discharge of industrial effluent water was provided to COW 1 (DK).
EUCC Conference in Lille 6-7 June 1996 "European Regiones for a safe and clean coast".
ETC/NC "General Approach Nature" Meeting - Copenhagen 6-7 May 1996
Presentation by Margarida Cardoso da Silva of the paper "Coastal Zone Management initiatives of the European Environment Agency" to the Conference LITTORAL '96 - Portsmouth 16-19 September 1996
Inter-Parlamentary Conference on the Environment Protection of the Black Sea. Istanbul 10-12 July 1996.
ETC/IW Workshop on Eutrophication - Paris 3-4 September 1996
Comments to Dobris+3 and EU State of the Environment
Participation to the preparation of a questionnaire on Eutrophication to be sent to the NFPs

4.1. Visitors to the ETC/MCE Leading Organisation Office

ORGANISATION	VISITOR
Nansen Environmental and Remote Sensing Centre - Norway	Olaf M. Johannessen
Satellite Observing System - UK	Tom Allan
Laboratoire de Physique et Chimie - France	Louis Prieur
RAC RSC - MAP - Italy	Monique Viel
Istituto di Fisica dell'Atmosfera CNR - Italy	Rosalia Santoleri
JRC - Ispra - Italy	Vittorio Barale

5. PRODUCTS/OUTPUTS

5.1. Products/outputs from 1995 Subvention Work Programme

Draft Reports to be published as Topic Reports in 1997

- Report on the First Interregional Forum
- Updated report on data collected within the framework of the regional conventions
- Report on data availability and access
- Report on integration of information on the Marine Environment of Europe
- Report on data management and quality assurance
- Indicators for coastal zone management and characterisation
- Coastal Zone of Europe. Data base for European Estuaries and Coastal Lagoons

5.2. Other Products

- Quarterly Progress Reports to the Agency
- ETC/MCE homepage (http://estaxp.santateresa.enea.it/www/etc/etc.html)

5.3. Statement of Main of Missions and Meetings by ETC/MCE

ETC MEETINGS			
Meeting among ETC/MC lead organisation for task sharing	G. MANZELLA	ROME	11/4/96
ETC/MC Kick-off meeting	C. MASELLA	S.TERESA	17-19/6/96
Meeting with ETC/MC co-leader and Workshop on Coastal Zone Management	G. IZZO	LISBON	4-10/7/96
Meeting for the preparation of the Inter-regional FORUM	M. C. da SILVA	ROME	9/9/96
Meeting ETC/MC - EEA (E.Papathanassiou) for the 1996 subvention and the preparation of the Inter-regional FORUM	T. MANNARINO	ROME	7-10/9/96
Preparation and participation to the Interregional FORUM	T. MANNARINO	ROME	30/9-9/10/96
Inter-regional FORUM of the ETC/MC	G. MANZELLA P.PICCO	ROME	7-8/10/96
Workshop on indicators organised by ETC/MC	G. IZZO	LISBON	13-17/11/96

Meeting with NIVA	G.IZZO	OSLO	25-27/11/96
Preparation of draft reports to be sent to the EEA	MANNARINO T.	ROME	26/11-4/12/96
Meeting for tasks 4 and 5 between ENEA, LNEC, RIKZ and IFREMER	L. DE VREES	LISBON	July-Sept. 96
Meeting for tasks 4 and 5 between ENEA, LNEC, RIKZ and IFREMER	F. VAN DER VALK	LISBON	July-Sept. 96
Meeting for task 2 Action III	T. BOKN	BERGEN	July-Sept. 96
Meeting for task 2 Action III	H.R. SKJOLDAL	OSLO	July-Sept. 96
PRESENTATION OF ETC WORK			
Presentation of the ETC/MC work to a Meeting 'Manager for the Marine Environment'	G. MANZELLA	TARANTO	27-28/5/96
EUCC Meeting on Coastal Zone Management	G. MANZELLA	LILLE	6-9/6/96
EURISY Meeting - presentation of the ETC/MC and satellite data use for environmental problems	G. MANZELLA	ROME	1-3/10/96
UK Littoral '96	M.C. da SILVA	U.K.	16-19/9/96
PARTICIPATION OF ETC/MC TO CONFERENCES AND WORKSHOPS			
Participation of ETC/MC to the Black Sea Environmental Programme Workshop	P. PICCO	ISTANBUL	9-12/7/96
European Commission Meeting on OSPARCOM	M.DALLA COSTA	BRUSSELS	17-18/7/96
Workshop oneutrophication organised by ETC/IW	G. IZZO	PARIS	3-4/9/96
Participation of ETC/MC to the IOC Meeting on data needs and management (MEDAR-MEDATLAS project) for the Mediterranean Sea	G. MANZELLA	PARIS	18-20/12/96

6. MANAGEMENT COORDINATION AND CONTROL

The ETC/MCE activities are carried out by a consortium of European partners co-ordinated by ENEA as a lead organisation and has devoted a staff of six persons to manage the different aspects of the ETC/MCE.

The main decisions (e.g., task leadership, responsibilities and deadlines) are taken in the consortium planning meeting of the ETC that is held in the beginning of the subvention activities. For the 1995 subvention a kick-off meeting was held in June 17-18/1996 in S. Teresa. In the meeting, one of the original partners, the MI (Marine Institute, Ireland) communicated the impossibility to perform the ETC activities and withdrew from the consortium. This event caused a reshuffling of MI activities that have been distributed to the remaining partners

In 1996 activities defined in the technical annex in three working packages whose responsibilities were respectively split between ENEA for WP1 and WP2 (EEA Project MW6) and LNEC for WP3 (EEA Project MW7).

A great effort in management was devoted to the building of interconnections and collaborations among the partners of the consortium as well as in understanding the respective capacities.

Complaints were made from partners in meeting the deadlines of the EEA work programme; little effort has also been shown to comment on the guidelines of EEA reports (Dobris+3, EU98 Reports).

In 1996, in addition to the June meeting, three other technical meetings were held where the partners met and agreed on progress in the working plan. For 1997, it was agreed that management committee meetings should be held at least two times per year.

7. PROPOSED WORK PROGRAMME ITEMS FOR 1997

Management and coordination	25 %
Ad hoc support to the EEA	
Development of EIONET	
Inter-Regional Forum	10 %
EEA Reporting (Dobris+3, Eutrophication monograph, State of European environment)	20 %
Mediterranean Sea Report	20 %
Proposals for data management	6 %
Testing of the indicators including data collection	12 %
Inventory of existing models for marine and coastal zone management	7 %

8. REFERENCES

ENEA (1995) - SCOPING STUDY- Improvement on coastal and marine water quality

EPA (United States) (1994) - A conceptual framework to support the development and use of environmental information, draft for external review, EPA 230-R-94-012.

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SWART R., et al. (1995) - Scanning the global environment, a framework for UNEP's reporting functions. UNEP/EAP.TR/95

UNEP (1992) - CONVENTION ON BIOLOGICAL DIVERSITY, 5 JUNE 1992. 92-7807, 24 p.

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