



**UNITED NATIONS ENVIRONMENT PROGRAMME
MEDITERRANEAN ACTION PLAN**



MED POL

**MUNICIPAL WASTEWATER TREATMENT PLANTS
IN MEDITERRANEAN COASTAL CITIES (II)**

**STATIONS D'ÉPURATION DES EAUX USÉES MUNICIPALES
DANS LES VILLES CÔTIÈRES DE LA MÉDITERRANÉE (II)**



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- Curbing Pollution
- Safeguarding Natural and Cultural Resources
- Managing Coastal Areas
- Integrating the Environment and Development

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List of MAP Technical Reports (MTS)

PREFACE

Throughout the centuries and long before the start of the industrial revolution, men have been using the sea as the most convenient place for the disposal of wastes resulting from human activities. The sea's self-purification ability has been largely abused. Dumping of domestic, industrial, and radioactive wastes, as well as the run-off from agricultural products have not only created considerable hazards to human health but have also endangered the marine environment.

The United Nations Conference on Human Environment (Stockholm, 1972) underlined the growing importance of the protection of the marine environment. During the same year in London, the Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matters was adopted which entered into force in 1975.

The major problems linked to the uncontrolled disposal of wastes in the marine environment were found to be:

- a) Dispersion of pathogen organisms capable of endangering human health;
- b) Toxic effects on aquatic life – including human life – caused by the various chemical substances reaching the marine environment;
- c) Deterioration of the quality of seawater – eutrophication – resulting from the widespread dispersion of nutrients and other organic and inorganic matters.

The above-mentioned problems do not affect the area of activities of one single international organization or of one single country. Instead, they have an impact at global level therefore several institutions of international character such as UNEP, WHO, IMO, OECD and others, developed programmes aimed at finding solutions to their respective priority problems.

At the level of the European Region, since the late 70's, studies and report prepared by scientists and researchers from different European countries indicated that the quality of the marine environment of the Mediterranean Sea was deteriorating. The studies clearly demonstrated the urgency for introducing remedial measures to stop the pollution of Mediterranean Sea.

The causes for the deterioration in the quality of the marine environment are numerous and most of them are interconnected, resulting in a very complex pollution situation.

One of the important causes of marine pollution is the high rate of population growth that the coastal zones of the Mediterranean Basin have experienced since the 1960's and 1970's. This widespread population growth has been accompanied by an increase in the standard of living leading to an equal increase in industrial development to satisfy the needs of the population.

As a consequence of urban and rural development in areas of extraordinary geographical beauty, the tourist population visiting those places has not ceased to grow. This increase in population has had a profound impact on the quantity and quality of wastes produced. Quite often during the tourist season, municipal services in charge of the safe disposal of solid and liquid wastes are totally unable to cope with the additional waste-load that invariably reaches the coastal waters.

However, in spite of the importance of pollution loads originating directly from human agglomerations in coastal areas, they appeared to be of minor importance when compared to other forms of pollution originating inland and discharged into the sea by various means. Discharges from “inland” municipal, industrial and agricultural districts, which are only partially treated or even in untreated form, are still reaching the sea through the hydrographic river network of the Mediterranean Basin.

Municipal wastewater is discharged directly into the immediate coastal zone, either untreated or subjected to various treatment procedures, through outfall structures of variable length, or reaches the sea by seepage as a result of leaks in sewerage systems or other causes. Municipal sewage carries increased loads of nutrients such as nitrogen and phosphorus, and a heavy load of microorganisms, including bacterial and viral pathogens. In cities and large cities, it usually contains a variety of chemical wastes both from households and from industries discharging directly into the public sewerage system.

PART I

1. ABOUT THE STUDY

1.1 Historical Background of the Study

The protection of the marine environment is an important issue that concerns the countries of the Mediterranean Region. The Mediterranean Action Plan (MAP) that was convened by the United Nations Environment Programme (UNEP) and was approved by all countries (Barcelona, 1975) is a common effort for the protection and upgrade of the marine environment.

In 1976 the representatives of the Mediterranean countries adopted the legal support needed for the implementation of the MAP Programme at a conference convened by UNEP in Barcelona. More specifically, in February 1976 the **Barcelona Convention** was signed as an international agreement between Mediterranean Countries for the protection of the Mediterranean Sea against pollution.

In addition to the Barcelona Convention, the Barcelona Conference adopted and signed two supplementary Protocols. One concerned the preventive measures required for protecting the Mediterranean Sea against the dumping of polluting matters from ships and aircrafts and the second protocol referred to the establishment of international cooperation to reduce pollution resulting from accidental spills of oil and other harmful substances. Both protocols were adopted and signed simultaneously with the Barcelona Convention, and entered into force in February 1978.

The preparation of appropriate legal instruments to deal with land-based sources of pollution has been an issue of major concern since it is estimated that land-based sources of pollution constitute more than 80% of the total pollution load of the Mediterranean Sea, therefore the Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources (LBS) was adopted and entered into force in 1983.

The above Protocol classified substances that have a deleterious effect on the aquatic environment in two main categories; a "black list" for substances that eventually have to be eliminated and a "grey list" for those substances, by which pollution has to be reduced.

In the 1995 Barcelona Resolution, the Contracting Parties affirmed their determination to use MAP as a tool for sustainable development. To this end the Barcelona Convention was revised and MAP was reformulated with the title of MAP Phase II, while the Mediterranean Committee on Sustainable Development (MCSD) was established as a consultative body to the partners in sustainable development in the Mediterranean. In 1996 the LBS Protocol was amended so as to include also Land-based Activities and MAP's component programme for pollution monitoring and research in the Mediterranean Sea (MED POL) entered then into Phase III for the period 1996 - 2005.

At the International level, the United Nations Environment Programme convened in Washington in 1995 an intergovernmental Conference to adopt the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA). The Conference clearly defined the need for action at the various levels of interventions required. Thus, at national level, emphasis was placed on the introduction of strategies and measures to enable the appropriate management of priority problems. Recognizing the need for the participation of countries in regional and sub-regional arrangements, the Conference stressed the importance of ensuring at national level the resources and instruments required for the effective functioning of regional and sub-regional arrangements.

In 1997 the Contracting Parties adopted the Strategic Action Programme to address Pollution from Land-based Activities (SAP), as a major tool to implement the amended LBS Protocol, taking also into account the provisions of the Global Programme of Action.

In what concerns the role and involvement of the World Health Organization, the Fiftieth World Health Assembly at Geneva, concerned about the potential risks to human health resulting from the deterioration of the Marine Environment, endorsed the Washington Declaration. Therefore, Member States were urged to support the implementation of the Global Programme of Action in general, especially with regard to public health aspects. They were also urged to participate in the development of a clearinghouse for the implementation of the Global Programme of Action and, in particular, to support WHO's efforts to lead the development of the clearinghouse mechanism for information on sewage.

The present document is the updated version as of the year 2003 document issued under the same title in 2000, which contained information on the municipal wastewater treatment plants in Mediterranean coastal cities with more than 10,000 inhabitants. The situation described in the previous document, corresponded to 1998-1999 according to the information received.

This study was related to: (a) the Genoa Declaration of 1985, where the Contracting Parties agreed to achieve ten targets by the end of the decade. Amongst the priority targets was the establishment of sewage treatment plants in all cities around the Mediterranean sea with more than 100,000 inhabitants and appropriate outfalls and/or treatment plants for all cities with more than 10,000 inhabitants, (b) the Strategic Action Programme to address pollution from land-based activities, where among the targets to be achieved, is the disposal of sewage from cities and urban agglomerations exceeding 100,000 inhabitants and areas of concern in conformity with the provisions of the LBS Protocol, and (c) the commitments of the Johannesburg Summit in 2002, regarding water and sanitation, that include halving of the proportion of population without access to sanitation by 2015.

1.2 Report on the Municipal Wastewater Treatment Plants in the Mediterranean Coastal Cities

The marine environment is subjected to various pressures, which are mostly related to wastewater discharge. The production of wastewater is attributed to human (domestic, industrial or agricultural) activities where use of water is very important and consequently the production of wastewater is inevitable.

The MAP Programme in 2000 (several years after the Barcelona Convention and at the end of the Water Decade) reviewed the status of wastewater treatment in Mediterranean coastal cities of more than 10,000 inhabitants. The study was conducted in the year 1999 and the results were published at the MAP Technical Report Series No. 128 (2000).

According to the Genoa Declaration sewage treatment plants were to be made available to all cities with more than 100,000 inhabitants and that appropriate outfalls and/or treatment plants for all cities with more than 10,000 inhabitants should also to be provided.

The scope of the study presented in the year 2000 provided information for all Mediterranean coastal countries, that was related to the collection of data for each country concerning the population served by wastewater treatment plants and the degree of the treatment provided.

The 2000 MAP report included the following information:

1. List of coastal cities with population (permanent and seasonal) greater than 10,000 persons reflected the situation in each country of the Mediterranean;
2. Existence of WWTPs serving all Mediterranean coastal cities with population more than 10,000 inhabitants;
3. Years of operation of the wastewater treatment plants;
4. Quantity of wastewater treated per day and per plant;
5. Degree of wastewater treatment, (primary, secondary, tertiary, or other degree of treatment);
6. Quantity of wastewater discharged into the marine environment, treated or untreated, and way of discharge.

A comprehensive analysis of the collected data at country and at regional level and assessment of the needs and the formulation of appropriate conclusions followed the collection of all available information.

1.3 Methodology and Procedures of the present Study

The present report updates the information of the year 2000 regarding wastewater treatment in coastal areas of the Mediterranean region, with recent data collected by each country, and aims at the comparison of the reporting periods.

The planning, methodology and working procedures of the study were prepared within the framework of the MED POL Programme. More specifically the information was collected at national level by the officially designated National MED POL Coordinator and included the following:

1. Update of the list of coastal cities with population greater than 10,000 inhabitants
2. Update of the number of WWTPs that serve coastal cities
3. Update of the quantity of wastewater treated
4. Update of the provided degree of treatment
5. Update of the quantity of treated and untreated wastewater and respective way of discharge
6. Evaluation of the provided updated information

Further to the above-mentioned specific parts of the study, a comparison was conducted between the two reporting periods (1999 & 2003) in order to assess the improvement of the situation to the environment.

2. MUNICIPAL WASTEWATER IN THE MEDITERRANEAN

2.1 Characteristics of Municipal Wastewater in the Mediterranean

According to a common definition, municipal wastewater refers to a mixture of domestic wastewater (residential settlements and services which originates predominately for human metabolism and for household activities) and industrial wastewaters. Industrial wastewaters are discharged to sewerage collection systems or directly enter the wastewater treatment plants, with or without previous treatment. Sewers may also convey groundwater and precipitation that infiltrate into the sewerage networks.

The quantity of wastewater entering the sewerage networks is site specific and depends upon on different factors. For the Mediterranean region, water consumption is to the order of 150-250 l/cap per day, a figure that in many areas of the region may be reduced significantly. Of the total quantity of water supplied to the communities 70-80% reaches the sewerage system, while the rest is infiltrated into the soil (e.g. irrigation of gardens). This

does not include industrial wastewater, which depending on local conditions, should also be taken into account, or infiltration inflow into the sewer, which depends upon hydrological conditions in each community.

Wastewater flows depend upon both the climatic conditions and the size of the community while at the same time in coastal communities of the Mediterranean, seasonal variations can be particularly pronounced due to tourist activity.

The composition of municipal wastewater depends upon factors that are related to the standard of living, climatic conditions, water supply systems, the available quantities of water, and composition of industrial wastes.

The basic quality parameters of municipal wastewater are the organic load (BOD₅ biochemical oxygen demand at 20°C over 5 days and the COD parameter), suspended solids, nutrients (nitrogen as N, phosphorus as P) and pathogens. In untreated domestic wastewater, the BOD₅/COD ratio ranges between 0.4 and 0.8.

The concentration of each substance in wastewater depends on the water consumption per capita per day. In the Mediterranean countries, due to limited available quantities of water, expressed as low daily consumption, higher concentrations can be expected in domestic wastewater.

Further to the main pollutants of wastewater, the presence of other substances such total dissolved solids and specific ions, such as sodium, calcium, magnesium and boron may also occur in wastewaters. In communities where industrial activity is intense the contribution of industrial wastewaters to domestic wastewater, is related to the presence of specific compounds/elements, such as phenols, pesticides, chlorinated hydrocarbons and metals (Cd, Zn, Ni, and Hg, etc.). These substances are of particular concern due to their toxicity and because they tend to resist conventional methods of wastewater treatment.

The presence of micro-organisms in municipal wastewater depends on the conditions of sanitation of the population and primarily of indicator organisms, which can be more easily estimated in wastewater than the pathogens, (coliforms, faecal streptococci, shigella, salmonella, *Pseudomonas aeruginosa*, *Clostridium perfringens*, *Mycobacterium tuberculosis*, protozoan cysts, helminth ova, and enteric viruses).

2.2 Impacts of Nutrients

The increase in the rate of supply of organic matter to an ecosystem, which is related to nutrient enrichment enhancing primary production, is known as eutrophication. The main nutrients causing eutrophication are nitrogen in the form of nitrate, nitrite or ammonium and phosphorus in the form of ortho-phosphate. In addition, supply of bioavailable organic phosphorus and nitrogen cause eutrophication, since bacteria under oxygen consumption regenerate the organic phosphorus to phosphate and the organic nitrogen to ammonium, which is further oxidised to nitrite and nitrate. Silicate is essential for diatom growth, but it is assumed that silicate input is not significantly influenced by human activity. Its most serious impact to the aquatic environment is related to algal blooms (red tides), algal scum, enhanced benthic algal growth, and at times a massive growth of submersed and floating macrophytes.

In addition to the effect on the aquatic ecosystem eutrophication and its side effects cause discolouration of waters, reduced transparency and disturbance to bathers thus impairing recreation activities. Dense macrophyte and macro-algae agglomerations chop channels, lagoons and estuaries impairing fishery and navigation and reducing flow and the holding capacity of freshwater reservoirs, etc.

The decaying organic material results to oxygen depletion of the water causing an array of secondary problems such as death of the benthic fauna, formation of corrosive and other undesirable substances such as CO₂, CH₄, H₂S, NH₃, organoleptic (taste and odour producing) substances, organic acids, toxins, etc.

Attachment of algal material and high pH can cause dermatitis and conjunctivitis, while ingestion of algae can cause diarrhoea in sensitive individuals. The development of toxin producing algae in the marine environment, when accumulated in fish, particularly shellfish, is a threat to human health.

The increase in frequency of algal blooms of toxic algae is responsible for causing paralytic and diarrhetic shellfish poisoning (PSP and DSP, respectively, produced by saxitoxin and other toxins in certain dinoflagellates and chrysophyceae), both already known for some time, and the appearance of new forms previously unknown or ignored such as amnesic shellfish poisoning (ASP) produced by domoic acid in diatoms.

2.3 Impacts of Pathogens

The presence of pathogenic micro-organisms in the marine environment may result to impacts on public health, through direct contact with polluted seawater and/or sand, including ingestion of the former while swimming and through consumption of contaminated seafood. Microbial pollution of the marine environment (seawater, sediments and beaches) may affect the gastrointestinal tract, or other parts of the body. As far as the former category is concerned, all the diseases which are spread by the faecal-oral route, and whose aetiological agents are shed in the faeces of diseased individuals or carriers could be contracted by swimming in polluted waters. Apart from diseases affecting the gastrointestinal tract, a number of diseases or disorders affecting the eye, ear, skin, upper respiratory tract and other parts of the body have been associated with bathing in waters where microbial pollution occurs.

The direct discharge of untreated wastewater into aquatic environment is one of the predominant reasons for the microbial pollution and deterioration of the marine environment. However, the general situation is progressively improving through the wastewater treatment facilities and the construction of submarine outfalls.

The permanent population that is concentrated at the Mediterranean Coast is to the order of 150 million inhabitants. It should be stressed however, that this figure may be doubled during the summer period since the area attracts many tourists from all over the world. During the summer months, the sea constitutes the main recreational amenity for local and tourist populations and consequently most beaches, especially those in the vicinity of cities and tourist resorts, are heavily overcrowded, particularly on weekends. The heterogeneous nature of beach populations further facilitates the spread of infections.

The prevailing warm climatic conditions result in a relatively long bathing season, and thus longer exposure of the public to seawater and/or beach sand, as compared to other, more temperate countries.

Microbial pollution may also be enhanced by the presence of aquacultures. Water and shellfish quality control measures vary in each country, and in many cases are practically based on "acceptable" concentrations of bacterial indicator organisms. While such organisms can provide a reasonable estimate of the degree of pollution, and perhaps a relative satisfactory correlation with concentrations of bacterial gastrointestinal pathogens, they have not so far been accepted as providing any clear correlation with the presence and density of either viruses or non-gastrointestinal pathogens and the biotoxins from algae (PSP, DSP). In general, there is very limited control over the quality of beach sand, which has only recently commenced to be recognized as a factor to be considered in the transmission of a number of skin and other contact infections, including fungal ones.

2.4 Municipal Wastewater Treatment

The collection and treatment of wastewaters results into point source pollution load, which is discharged into the environment. Depending on the treatment provided, wastewater can be further used (restricted or unrestricted irrigation etc).

Wastewater treatment is achieved through physical, chemical and/or biological processes. Depending upon the degree of treatment, the following processes are identified:

- i) Pre-treatment refers to the removal of bulky matter, sand and gravel, greases and oils from wastewater;
- ii) Primary treatment includes the application of physical and/or chemical treatment processes for municipal wastewaters that lead to 50% reduction of suspended matter and by 20% reduction of organic load (BOD₅);
- iii) Secondary treatment involves the application of physical and/or chemical, biological and other processes, which in municipal wastewaters reduce the concentration of suspended matter and BOD₅ by 70-90%, and COD concentrations at least 75%. When biological treatment is applied a minimum reduction of nutrients to the order of 20% can be also achieved.
- iv) Tertiary treatment includes the application of physical and/or chemical, biological and other procedures which in municipal wastewaters reduce the concentration of nutrient salts by 80%.
- v) Disinfection is a separate process, which is applied in order to further reduce the number of pathogenic micro-organisms in treated water.

The application of advanced treatment processes (e.g. filtration, additional chemical treatment), combined with the process of disinfection, results in better effluent quality. In these cases and according to the existing legal framework wastewater can be used.

The most important factors that should be considered when evaluating and selecting unit operations and processes for each case, may be grouped as follows:

- process applicability, performance
- environmental constraints (way of discharge, location)
- maintenance and operation requirements (cost, personnel, education level of the personnel)

Wastewater treatment results to the production of sludge during primary and/or secondary sedimentation. Disposal of sludge in the environment without prior treatment may result in significant pollution and threat to public health. The legal framework regarding sludge disposal (at least according to EU Legislation) is progressively encouraging sludge reuse into agriculture. The current trend for sludge utilisation and reuse is combined to the adoption of the term "biosolids" rather than "sludge".

2.5 Wastewater Discharge into the Sea

The discharge of wastewater to the sea should follow for each case the legislation in force. For example, countries that are members of the European Union, should follow the provisions of the Directive 91/271/EC concerning urban wastewater treatment, (i.e. at least secondary treatment should be provided for agglomerations of more than 10,000 p.e., that discharge their wastewater to coastal areas). Furthermore, according to the SAP, the

application of marine outfalls, given appropriate water treatment or a higher degree of treatment should take place in order to obtain or maintain agreed environmental quality criteria and to avoid exposing shell fisheries, water intakes and bathing areas to pathogens and to avoid the exposure of sensitive environments to excess nutrients or suspended solid loads. The design of marine outfalls is related to the principle of self-purification of waste in the sea, through the process of dilution, dispersion and decomposition. The selection of the way of discharge depends upon hydrographical, topographical and geological conditions in the coastal zone and hydrodynamic conditions in the sea.

3. RESULTS ACHIEVED

3.1 Brief Summary of Data Collection

Data from 19 Mediterranean countries were progressively collected until country summaries were produced using the most reliable information available. The following list presents, in alphabetic order, the countries involved in the study.

Albania, Algeria, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Monaco, Morocco, Slovenia, Spain, Syria, Tunisia and Turkey.

In Bosnia and Herzegovina there is the city of Neum that discharges the wastewater treated through a sub-marine outfall at the nearby coast of Croatia.

Great variations in the data collected between countries as well as between cities were found, which were expected considering the existing variations between the quantity and the quality of wastewater services provided by the different areas. The procedures and the time that each country adopted for the collection of this kind of data could also explain the differences found. Thus, while some countries have a relatively up-to-date list of coastal cities with the present population, other countries used the same figures as those presented in the 2000 MAP report since new data is not available. The information provided between the two reporting periods (2000 and 2003) cannot be easily compared due to the significant differences observed on the reporting data of some countries (e.g. differences in the list of cities reported, as the same treatment plant serves more than one city).

In view of the above-mentioned difficulties, a comparative analysis of data in between countries is not a hundred per cent possible, considering the dissimilar set of data amongst the countries (i.e. although the format and fields of the table that had to be completed was provided, some countries either did not fill all the fields, or preferred to sent the data in their own format). For this reason the comparison between the two reporting periods could only be based on general figures rather than detailed information.

The tables and graphs presented in Part III of this document reflect the situation as reported. For each individual country the current situation did not considerably improved as compared to the situation in 2000, that could be attributed to the fact that the data reported by many countries was more or less the same.

3.2 Constraints Encountered

Considering the specific characteristics and possible difficulties experienced by each country during the reporting, it was inevitable to encounter a series of constraints.

The most important constraints encountered are quoted below:

- In many cases the requested forms were not fully completed. For example, although information regarding the quantity of treated wastewater (i.e wastewater production,

collection, treatment and final disposal) was provided, that was not the case for untreated wastewater discharges.

- A group of countries reported the permanent population, while there was no separate information for seasonal increase of the reported figure due to tourists. The only indication for the population increase derived from the population served by a wastewater treatment plant. Other countries, mainly EU Member States, reported population equivalent (i.e. permanent plus seasonal population) that practically coincides to the reporting format required by the European Commission and it was accepted in order to avoid double effort the data.
- With respect to the population served by wastewater treatment plants, in few cases absence of wastewater treatment plants was reported whereas a given number of population was served. The figure reported as population served probably referred to a number of population served by on-site individual wastewater treatment systems.
- According to the provided information, the following possibilities were identified:
 1. A city served totally by a sewerage network and a wastewater treatment plant with the capacity of collecting and treating the total amount of sewage produced. (Discharge of 100% treated sewage).
 2. A city served totally by a sewerage network and a wastewater treatment plant, but the capacity of the plant does not permit the treatment of the total amount of sewage produced. (Discharge of treated and untreated sewage).
 3. A city with no treatment plant but with sewerage network covering 100% of the population. (Discharge of 100% untreated sewage).
 4. A city with no treatment plant but with a sewerage network not covering the total population of the city. (Discharge of untreated sewage, plus existence of individual wastewater disposal systems, e.g. septic tanks).
 5. A city without sewerage network and served only by individual on-site systems. However, this situation usually does not occur for coastal cities with more than 10,000 persons.
- Accurate reporting on the degree of treatment of wastewater also proved to be difficult. In several cases the information was not available. The study proposed to use the standard classification for Primary, Secondary and Tertiary Treatment, as described in section 2.4.
- With respect to the quantity of wastewater treated and untreated and the way of disposal, some countries probably experienced difficulties in completing the required information, due to lack of adequate and reliable data.
- Regarding the year of construction, information was not always available.

Acknowledgement should be made to the efforts made by the national MED POL Coordinators to overcome the constraints encountered.

3.3 General Considerations on the Contents of the Tables

1. The study examines the coastal cities that discharge their municipal wastewater into the sea, thus contributing to the pollution of the marine environment. Rivers that are the recipients of wastewater discharges (treated or untreated), from inland cities, also represent a municipal wastewater pollution point source in the Mediterranean, however these were generally not taken into account.

2. Some countries reported cities with a resident population of less than 10,000 inhabitants. These cases were considered during the evaluation of data, due to seasonal population increase.
3. Some countries have reported the capacity of the treatment plant related to population equivalent (PE). This is reflected in the tables under the appropriate column heading, while the column 'population served' does not appear. As already mentioned this mainly occurred with EU member states due to their obligation of reporting.
4. Occasionally, when adding the population served by a treatment plant to the remaining population, which according to the information provided is served by a sewerage network, the figure obtained is below the resident population reported. This, although not in all cases can be explained by accepting the fact that a sector of the population uses septic tanks or cesspools or other similar methods of wastewater disposal.
5. With respect to the quantity of untreated wastewater discharged, the provided information is limited and thus, a concrete conclusion regarding the quantity of sewage discharged untreated cannot be easily drawn.
6. Where more than one date appears under the column "year of construction", it means that the plant was renovated or expanded.

3.4 General Tables and Graphs

Summary of Results

Total number of countries	19
Total number of cities	601
Total number of wastewater treatment plants	665

Total number of wastewater treatment plants	665	
<i>Cities without a wastewater treatment plant</i>	138	21%
<i>Cities with a wastewater treatment plant under construction / projected</i>	40	6%
<i>Cities with a wastewater treatment plant on maintenance /out of operation</i>	31	4%
<i>Cities with a wastewater treatment plant</i>	456	69%

Cities with a wastewater treatment plant	456	
<i>Pre-treatment</i>	9	2%
<i>Primary treatment</i>	83	18%
<i>Secondary treatment</i>	249	55%
<i>Tertiary treatment</i>	68	15%
<i>Unknown treatment</i>	47	10%

Total number of cities for which population was reported	593
<i>Total number of cities with more than 100,000 inhabitants</i>	104
<i>Total number of cities with more than 10,000 inhabitants and less than 100,000 inhabitants</i>	464
<i>Total number of cities with less than 10,000 inhabitants (included due to seasonal population)</i>	25

Total number of cities with more than 100,000 inhabitants	104	
<i>Total number of cities with more than 100,000 inhabitants served by a treatment plant</i>	77	74%
<i>Total number of cities with more than 100,000 inhabitants not served by a treatment plant</i>	27	26%

Total number of cities with more than 10,000 inhabitants and less than 100,000 inhabitants	489	
<i>Total number of cities with more than 10,000 inhabitants and less than 100,000 inhabitants served by a treatment plant</i>	332	68%
<i>Total number of cities with more than 10,000 inhabitants and less than 100,000 inhabitants not served by a treatment plant</i>	157	32%

Total number of "resident" population reported	58,730,024 (for 593 cities)
<i>Population served by a sewerage network and a treatment plant (included the population that is due to be served)</i>	52,242,800

Total cubic metres of wastewater treated per day (for reported information)	≈ 6.1 million	84%
Respective population	≈ 36.7 million	
Total cubic metres of untreated wastewater per day (for reported information)*	≈ 1.15 million	16%
Respective population	≈ 16.2 million	

*Note that this quantity is not totally discharged in the aquatic environment.

Total wastewater, cubic metres per capita per day	0.120
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The results obtained are presented in a form of graphs at the end of Part III of the report.

4. COUNTRY FACTS

4.1 Albania

Four coastal cities were reported (the same reported in 2000) with a resident population of 290,000 persons. New information was included mainly with respect to the population served by a sewerage network (about 38% of the total population), since three out of four cities are today served by collection systems. It should be stressed however, that there are no wastewater treatment facilities and thus the collected sewage is directly discharged into the sea untreated.

4.2 Algeria

A total of 99 coastal cities with a resident population of 4,290,350 persons were reported. This total includes the large urban agglomerations of Algiers, Anabas, Bejaia, Mostaganem, Oran and Skikda. The total population served by wastewater treatment plants reached 1,631,590 persons or 38% of the total population to be served.

4.3 Croatia

Ten coastal cities were reported with a resident population of 796,600 persons. Comparing the 2003 reported data to the respective information of the 2000 reporting period, one area was excluded (Susak), whereas area of Opatija-Lovran was added to the list of cities with population over 10,000. Furthermore, the cities of Split and Solin are currently served by a common wastewater treatment plant. With respect to the treatment provided, this is limited to primary treatment for the eight out of ten cities. The disposal of primary treated sewage is conducted through submarine outfalls in all cases, while untreated sewage is disposed into the aquatic environment by many small submarine outfalls.

4.4 Cyprus

Cyprus is the only country where all wastewater produced is treated and is reused, thus there is no disposal of sewage into the sea. Four coastal cities were reported both in 2000 and 2003 reporting periods, with current permanent population 330,300. In three out of four cities, 45% of the population is served by sewage network and wastewater treatment facilities, while according to the reported information, the part of the population that is not served by plant and network is served by individual treatment systems. The fourth area receives significant number of seasonal population (the population practically doubles during summer period) and the wastewater produced is collected and treated to a wastewater treatment plant providing for tertiary treatment. The average production per capita per day of treated wastewater is estimated at 0.125cu.mt.

4.5 Egypt

A total of 12 coastal cities with a resident population of 5,161,000 inhabitants was reported (2003), most of them concentrated to the cities of Alexandria and Port Said. The number of cities with a wastewater treatment plant is 6, or 50% of the total. However, according to the available information, the coastal city of Alexandria seems to produce large quantities of primary treated wastewater (74% of the population is served by wastewater treatment plant). Out of the six treatment plants reported, one provided primary treatment (Alexandria) and the remaining secondary treatment. Two additional secondary treatment plants were reported as being under construction (areas of Baltim and Rashid). With respect to the treated wastewater discharge, predominant site of discharge is at the mainland or freshwaters, while there is no direct discharge of treated sewage into the sea. Regarding the untreated sewage there is no adequate information on either quantities or way of discharge.

4.6 France

The number of coastal cities that are currently reported is 70 as opposed to the 41 areas reported in 2000. In all cities there are wastewater treatment facilities that provide for secondary (62% of the plants) or primary (38% of the plants) treatment while there are only two areas (Roquebrune Cap Martin, Villefranche Sur Mer) with no wastewater treatment plant.

The total population served (permanent and seasonal) is 4,753,663 habitants and according to the available information about 950,000 cubic meters of treated wastewater is disposed to the sea (82% of the total quantity) or in surface waters (12% of the total quantity). The majority of wastewater treatment plants (75%) were constructed before 1990. No information was provided concerning the quantities of untreated wastewater and way of disposal.

4.7 Greece

The reported information for the two reporting periods of 2000 and 2003 varied significantly and thus comparison of data is not possible. The new data are considered more

accurate and better represent the situation in Greece. According to the current information, in Greece there are 63 areas each with population greater than 10,000 that are located close to the coastline, with a total population of 7.2 million. It should be noted that this figure also includes the seasonal population that in several cases may result to the significant increase of the permanent population. More than 60% of the population is located to the greatest Athens area (capital of Greece) and Thessaloniki. The former is served by a wastewater treatment plant located at the island of Psyttalia, that provides for secondary treatment (the operation of the biological treatment unit will start at the beginning of 2004).

According to the reported information only 10% of the wastewater produced is untreated, although it should be noted that untreated sewage is not directly discharged to the marine environment since in most cases raw sewage from households is collected to septic tanks. With respect to treated wastewater in most cases this is disposed after secondary treatment through submarine outfalls or in some cases through rivers or streams to the sea. The majority of wastewater treatment plants were constructed after 1990s.

4.8 Israel

Nine coastal cities were reported, the same with those reported in 2000 with a total population of 3,640,000 habitants. According to the information provided all cities are served by respective wastewater treatment plants, which in seven out of nine cases provide for secondary treatment, while only in two cases the treatment is primary. There is no discharge of untreated wastewater while treated wastewater is discharged to the sea through submarine outfalls (7%) or is reused (93%). The average per capital production of wastewater is about 0.165 cu.mt.

4.9 Italy

The reported data involve a total of 120 cities with a resident population of about 8,000,000 persons, currently served, or projected to be served by 138 wastewater treatment plants. The total population served by wastewater treatment plants reaches a figure of 9,700,000 including the seasonal population. The operation of 138 operational treatment plants was reported, while 20 more plants are either under construction, projected or forecasted.

Treatment of wastewater was distributed as follows: primary treatment 20 plants (14%); secondary treatment 54 plants (39%); tertiary treatment 18 plants (13%), and for the remaining 46 plants (33%), no information on the degree of treatment was available. No information was provided concerning the quantities of untreated wastewater and way of disposal.

Regarding the year of construction of the plants, some of them started their operation as far back as in the early 30's while the majority of the plants were constructed in the 70's and 80's.

4.10 Lebanon

The currently reported coastal areas and data were the same with those reported in 2000. Seven coastal cities were reported with a resident population of 2,256,000 persons, nearly half of them coming from Beirut Greater Area.

Only one of the seven cities, (Beirut), is served by a primary wastewater treatment plant. Thus, wastewater facilities serve 32% of the population, while sewage system network serves the remaining 68%.

The total wastewater produced is in the order of 300,000 cubic meters per day, 70% of which is untreated and discharged raw in the marine environment, through small submarine outfalls.

4.11 Libya

The survey covered 17 coastal cities with a resident population of 4,062,000 persons. The areas and data reported were the same for both reporting periods. According to the available information 16 wastewater treatment plants are currently in operation or under construction, while only one city is not served by a wastewater treatment plant. With respect to the wastewater produced the information is not complete, however in most reported cases the effluent is being reused. Most of the plants were constructed in the 80's.

4.12 Malta

The information provided in the two reporting periods was practically the same, with small differences in populations, thus there were no new data that could alter the previous situation regarding coastal cities and respective wastewater treatment plants in Malta.

One single wastewater treatment plant, constructed in 1983 is in operation and provides services to a total of seven localities. This is a tertiary treatment plant with sand-filtration and chlorination treating about 17,000 cu.mt of wastewater per day. The existing treatment plant serves approximately 55% of the population and the treated sewage produced is reused for agricultural purposes.

Six coastal cities are served by different sewage networks, resulting to the discharge of a total of 75,000m³/d untreated wastewater through submarine outfalls into the sea. According to the reported information by 2007 all sewage will be treated following the construction of sewage treatment plants for Malta South, Malta North and Gozo.

4.13 Monaco

According to the information of both reporting periods in Monaco there is one single locality with a resident population of 35,000 persons that is served by a sewerage network together with a secondary treatment plant. A total amount of 17,500 cubic meters of wastewater is produced per day. The plant was constructed in 1987 and also treats the wastewater from nearby French coastal areas for a total of 70,000 inhabitants. The disposal of treated sewage is conducted through a submarine outfall to the marine environment.

4.14 Morocco

The information available for the two reporting periods (2000-2003) cannot be easily compared, since the data provided varied. The new data are considered more accurate and better represent the situation in Morocco. Twelve coastal cities have been currently reported as opposed to the four areas reported in 2000. The total permanent population is 1,473,290 from which a small percentage (10%) is served by wastewater treatment facilities that provide for tertiary treatment. Two projects for new wastewater treatment plants that will serve the areas of Tetouan and Tanger are in progress. All wastewater produced (treated and untreated) is directly discharged into the sea.

4.15 Slovenia

In Slovenia there are three coastal cities with a resident population of 76,000 persons. In two areas there are wastewater treatment plants that provide for primary treatment of 53% of the total population reported. Treated wastewater is either directly discharged into the sea (area of Koper) or through a submarine outfall (area of Piran). The untreated wastewater is in most cases discharged through small outfalls into the sea.

4.16 Spain

A total of 73 coastal cities were reported with a resident population of 6.4 million persons. According to the information provided a total population of 12 million is served by wastewater facilities. In Spain 74 wastewater treatment plants are in operation that in 90% of the cases provide for secondary or tertiary treatment. With respect to the quantities of wastewater (treated and untreated) and way of discharge there was no available information.

4.17 Syria

Seven Mediterranean coastal cities were reported with a total resident population of 607,635 inhabitants as opposed to 1,408,000 persons reported at 2000. According to the information provided, all the population is served by network and probably by individual autonomous wastewater services such as septic tanks or other similar devices. The total amount of untreated wastewater discharged mainly to the sea through small submarine outfalls, is to the order of 60,000 m³/d, corresponding to 0.10 cu.mt per capita per day.

4.18 Tunisia

A total of 33 coastal cities were reported with a resident population of 3,982,900 persons. Nine coastal cities were added to the list of 2000, all with population greater than 10,000. Respective wastewater treatment plants will serve six of these areas by 2004. From the current information provided 76% of the total permanent population is served by a sewerage network together with a wastewater treatment facility. An additional number of 135,000 persons are served by a sewerage network only. A total of 36 treatment plants are currently in operation serving 22 coastal cities, while seven more wastewater treatment plants are expected to start their operation by the next year. Five plants were reported having tertiary treatment, whereas 30 plants (out of 36 which are in operation) provide for secondary treatment. According to the reported information and with respect to the wastewater discharge, 63% of the wastewater produced is treated and in most cases is directly disposed to the sea. The total quantity of untreated wastewater is also directly discharged to the sea.

4.19 Turkey

A total of 41 coastal cities were reported, the same with those reported in 2000. Slight differences were observed in the permanent population, while significant variations were related to the population served by wastewater treatment plant and/or network. 62% of the population is being reported as having wastewater treatment facilities (19 wastewater treatment plants serve about 3 million habitants). The reported quantity of treated wastewater (about 721,000 m³/day) is discharged in most cases through submarine outfalls to the sea, whereas untreated wastewater is mainly directly discharged to the sea.

5. CONCLUSIONS OF THE PRESENT STUDY

- a) All countries responded to the call to update their information regarding the municipal treatment facilities at the coastal cities with population greater than 10,000 persons. The information gathered as compared to the previous reporting period, can be characterised as more accurate, since insufficient or sometimes wrong data that were the result of misinterpretation of the requested information, were now corrected.
- b) Acknowledgment has to be made to the National MED POL Coordinators who with a sense of responsibility assisted during the collection and elaboration of data and aid to overcome the constraints encountered. Thanks to their efforts, adequate and accurate data could be gathered during the present study.

- c) With respect to the population reported by each country, some countries included the seasonal population to the figure of permanent population, with respective remarks indicating that, while other countries did not provide any information for the population increase. In any case the information is important for the estimation of peak loads that are usually applied during the design of sewage networks and wastewater treatment plants. Furthermore, recent data enable the projection and design of new wastewater disposal systems, as well as the efficient monitoring and evaluation of the performance of operating wastewater treatment plants.
- d) The difficulties that may have been encountered by each country are mainly related to the availability of information. Their constraints are also related to those encountered during the elaboration of the data available. Although, as already mentioned the present study includes accurate data, the most important constraints have to be identified:
- Insufficient data for the seasonal increases of population;
 - Incomplete or diffuse information on the quantities of wastewater treated or untreated and respective ways of disposal;
 - Incomplete information concerning the details for the services being provided to the population, (e.g. population serviced by treatment plants or by a sewerage network only or by alternative systems, information on the degree of treatment, year of construction of plants).
- e) Further to the current situation with respect to wastewater treatment facilities in the Mediterranean region, the protection against wastewater discharges directly into the environment should also involve the indirect forms of pollution which refer to the use of septic tanks (pollution of groundwater and indirectly the marine environment) or the discharging of wastewater from recreational marine vessels. However, in both cases available accurate data or even estimations are difficult to obtain.

PART II

MUNICIPAL WASTEWATER TREATMENT FACILITIES

Legend

Degree of treatment

Primary treatment	includes the application of physical and/or chemical treatment procedures for municipal wastewaters with which at least 50% of suspended matter is removed and BOD ₅ values are reduced at least 20% from initial concentrations.
Secondary treatment	involves the application of physical, chemical, biological and other procedures, which in municipal wastewaters reduce the concentration of suspended matter and BOD ₅ 70-90%, and COD concentrations at least 75%.
Tertiary treatment	includes the application of physical, chemical, biological and other procedures which in municipal wastewaters reduce the concentration of nutrient salts 80%, and remove other specific wastewater parameters, achieving values unattainable by means of secondary treatment.
Pre-treatment	involves the application of operations with which bulky matter, sand and gravel, greases and oils are removed from wastewater.

Planning and designing of urban wastewater treatment projects in Mediterranean coastal cities (MAP/UNEP/PAP , 7/TC, 4/1, 1992)

Symbols

Discharge

DI = discharge directly into the sea

SO = discharge through a submarine outfall

Ss = discharge through many small submarine outfalls

RE = discharge is re-used

Source of information: Data reported by the MED POL National Coordinators

**MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: ALBANIA**

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Durres	140		65.24	No	-	-	-	-	9,590	DI
Lezha	18			No	-	-	-	-	1,150	DI
Saranda	12		3.50	No	-	-	-	-	2,000	DI
Vlora	120		40	No	-	-	-	-	9,000	DI + Ss
Remarks: <i>Due to mobility of population the data on permanent population are estimated only and some changes may have occurred</i>										

Data reported by the MED POL National Coordinator

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: ALGERIA

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/ day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/ day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Aïn Benian	51.695			WWTP of Béni Messous	Under construction					DI
Chéraga	38.283					Lagoon				
Staoueli	23.681			WWTP of Staouali	1990	75 % (secondary)	15,000 p.e.	Existence of sedimentation tank		DI
Zeralda	32.995									
Alger	89.585			WWTP of Baraki	1989	60 % (primary)	750,000 p.e.			DI
Bab El Oued	86.804									
Belouazdad	58.725									
Bologhine	43.514									
Casbah	49.482									
Hammamet	17.800									
Hussein Dey	48.184									
Mohammadia	40.603									
Rais Hamidou	20.724									
Sidi M'Hamed	84.082									
Ain Taya	29.183			WWTP of Réghaia	1997	30 % (primary)	400,000 p.e.			DI
Bordj el Bahri	27.639									
Bordj el Kiffan	99.459									
H'raoua	18.121									
Réghaia	64.709									
Achaâcha	33.721		5058						180	DI
Afir	12.613	1,4 km	7567	No		No	No	No	336	River+Ss
Ain El Bya	26.253			No						DI
Ain El Kerma	11.145			No					300	River
Aïn El Turk	31.980			Yes*					4797	DI
Ait Cheffa	4.006		600	No					320.6	
Annaba	244.671		236738	Yes	1983	Good (primary)	8000	DI		
Aokas	15.811	13439		Yes*	1984				470.12	DI
Arzew	66.185			No					1800	DI
Azzefoun	17.037		7667	Yes (on project)			200	RE+River	1503.7	River+Ss
Béjaia	162.348	157478		Yes*	1985				18000	DI
Ben Abdel Malek Ramdane	13.767		7512						281	DI
Ben Azzouz	26.575	13021		Sedimentation tank + septic tanks		Middle (primary treatment)	1718	River		
Beni Saf	42.175		40066	No					3821	Port
Bethioua	14.404			No						DI and Lake

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/ day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/ day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Bir El Djir	72.565			Yes*						DI
Bou Ismail	42.157		40470	No			No		4400	Ss
Boudouaou El Bahri	10.512	1,71 km	10512	No		No	No	No	464	DI+River
Boukhelifa	11.236		9214	No					192.75	DI
Boumerdes	33.646	8,5 km	28599	Yes	2001	Secondary	9904	DI		DI
Bousfer	10.994			Yes					1317	DI+River
Cap Djenet	20.022	0,71 km	20022	No		No	No	No	1440	River
Charaia	14.675	6467		Yes**		Low (pretreatment)	841	River		
Chatt	28.224		19756			Sedimentation tank	No		576	River
Cherchell	44.700		41124	No			No		8320	Ss - Sea discharges
Collo	33.505	26804		Yes		Middle (primary treatment)	3581	River		DI
Corso	13.118	2,8 km	12462	Yes (WWTP of Boumerdès)	2001	Secondary	1304	Ss - Sea discharges	No	No
Damous	15.826		12660	No			No		1680	Ss - Sea discharges
Dellys	28.229	2,53 km	26817	No		No	No	No	3040	Ss - Sea discharges
Douaouda	18.522		13335	No			No		1600	Ss - Sea discharges
El Aouana	12.494		5497	No					1000	DI
El Bouni	27.032		17527	lagoons	1983	Good (primary)	2000	DI		
El Kala	25.772	23194	24483	Yes*	1984		6848	DI	1712	DI
El Kennar	15.156		7578	No					1370	River coastal
El Milia	75.600		45360	No					7016	River coastal
Emir AEK	34.380		27504	No					2695	DI
Fil.Fila	26.767	18737		Sedimentation tank	1986	Middle (primary treatment)			640	DI
Fornaka	15.177		11359						769	DI
Fouka	43.369		41200	No			No		3600	Ss - Sea discharges
Gdyel	29.264			No						DI
Ghazaouet	35.000		7000	No					4000	DI
Gouraya	18.823		12800	No			No		1600	Ss - Sea discharges
Hadjadj	17.327		9703						340	DI
Ifliissen	15.524		13661	No			80	discharges with sedimentation tank	1472	discharges in open air

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/ day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/ day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Jijel	124.941		123692	No					14993	DI
Kerkera	26.077	20861		Sedimentation tank		Middle (primary treatment)	240	River		/
Khadra	13.252		4638						294	DI
Khemisti	13.841		13426	No			No		800	Ss – Sea discharges
Leghata	11.885	5,01 km	11885	No		No	No	No	2240	River - Oued discharges
Marsa	10.735		7085	No					219	Ss – Sea discharges)
Marsa El Hadjadj	11.000			No					250	DI
Mazagran	16.499		15014	No					910	DI
Melbou	10.464		8580	No					98.49	DI
Mers El Kebir	16.000			No					2500	DI
Mizrana	10.098		8979	No			80	Discharges with filtration bassins	929.8	Discharges to the sea and discharges to open air
Mostaganem	141.313		137014						17598	DI
Oran	831.344			No					8500	DI
Ouled Atia	11.017		3966						320	River
Ouled Boughalem	12.756		1276						85	DI
Oulhaça	15.880		10480	No					1259	River
Sidi Abd Errahmane	19.449		10697	No					1534	Ss – Sea discharges
Sidi Ben Adda	13.149		12360	No					829.6	River
Sidi Daoud	14.889	05 km	14889	No		No	No	No	2080	River discharges
Sidi Ghiles	13.960		12843	No			No		1280	Ss – Sea discharges
Sidi Lakhdar	33.979		13591						616	DI
Skikda	166.759	150083		No		Low (pretreatment)			10805	DI
Souahlia	22.144		4144	No					2000	DI
Souk El Tenine	12.244		11632	No					336.12	DI
Stidia	11.165		6106						629	Natural excavation
Taher	72.500		61625	No					2642	River coastal
Tamalous	41.877	23032		Yes**		Middle (primary treatment)	1468	River		
Tenes	37.891		36375	No					1709.58	Ss-Sea discharges
Thenia	19.076	1,1 km	19076	Yes	2002	Secondary	1280	River discharges	No	No
Tichy	14.968	13471		Yes*	1975				391.32	DI

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/ day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/ day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Tigzirt	11.016		9364	Yes (on project)			80	discharges with sedimentation tank and filtration bassins	1021.6	discharges to the sea and discharges to open air
Tipaza	24.031		19465	No			No		5200	Ss-Sea discharges
Toudja	12.687		8881	No					212	DI
Zemmouri	21.012	4 km	20591	Yes	2002	Secondary	800	Ss-Sea discharges	No	No
Ziama Mansouriah	12.881		11206	No					1030	DI
Remarks: * Plant out of service ** On-site storage to septic tanks										

Data reported by the MED POL National Coordinator

**MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: CROATIA**

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Dubrovnik	50	45	5	Yes		Primary	9,000	SO	1,000	Ss
Makarska	26.4	22.9	3.5	Yes	1979	Primary	4,580	SO	700	Ss
Opatija-Lovran	25	7	18	Yes	1988	Primary	1,400	SO	3,600	Ss
Primosten*	2	1.6	0.9	Yes	1988	Primary	1,200	SO	300	Ss
Pula	63.9	56	7.9	Yes	1986	Primary	11,200	SO	1,580	Ss
Rijeka	193.9	104.0	89.9	Yes	1994	Primary	20,800	SO	17,890	Ss
Rovinj	11.3	7	4.3	Yes	1985	Primary	1,200	SO	4,900	DI+ Ss
Sibenik	67.2	27	40.2	No	-	None	-	-	13,440	Ss
Split-Solin**	276.6	207.7	68.9	Yes	1998	Primary	41,540	SO	13,780	Ss
Zadar	80.3	51.2	29.1	No	-	None	-	-	16,060	Ss

Remarks: * Included due to high seasonal population increase
** The cities Split and Solin have a unified sewage system

Data reported by the MED POL National Coordinator (source: Croatian Waters)

**MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: CYPRUS**

City	Permanent Population (in 000) 2001	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day) Year 2003	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Famagusta (Greater Area) (Ayia Napa & Paralimni)	38	75 (Including tourist)		Yes	2001	Tertiary	8,200	RE	-	*
Larnaca	75.30	35		Yes	1997	Tertiary	5,500	RE	-	*
Limassol	151	70		Yes	1995	Tertiary	8,500	RE	-	*
Paphos	66	25		Yes	2002	Tertiary	3,000	RE	-	*
Remarks: * Population which is not served by plant + network, is served by individual units and so there is no discharge of untreated waste water into the sea, even during high seasonal population increase										

Data reported by the MED POL National Coordinator

**MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
COUNTRY: EGYPT**

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge Of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge Of Untreated Wastewater
		Plant+Network	Network							
Alexandria	3,800	2,800	1,000	Yes	1994	Primary	1,320,000	Lake	-	-
Baltim	39		39	Under construction		Secondary	10,000	DI		
Borg el Arab	49		49	No		-	-	-	-	-
Dumya (Damietta)	125	125		Yes	1994	Secondary	60,000	Lake	-	-
Dumya (Damietta) new city	95	95		Yes	2000	Secondary	1,900	Lake	-	-
El Arish	150	150		Yes	1982	Secondary	12,000	Desert	-	-
	20		20	No	-	-	-	Desert	5000	-
El Daba	44		44	No		-	-	-	-	-
Hummam	38		38	No		-	-	-	-	-
Marsa Matruh	92		92	Yes	2002	Secondary	50,000	RE	--	-
Port Said	500	500		Yes	1997	Secondary	190,000	Lake	-	-
Rashid (Rosetta)	185		185	Under construction		Secondary	20,000	RE	-	-
Sidi Barrani	24		24	No		-	-	-	-	-

Data reported by the MED POL National Coordinator

**MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: FRANCE**

City	Permanent Population (in 000) *	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Agde	181.80	181.80	181.80	Yes	1969	Secondary	25,141	River		
Ajaccio	77.61	73	73	Yes	1981	Secondary	14,488	SO		
Antibes ET Biot	146.27	146.27	146.27	Yes	1990	Secondary	33,642	SO		
Argeles-sur-mer	67.17	67.17	67.17	Yes	1957	Secondary	12,773	SO		
Banyuls	14.34	11.30	11.30	Yes	1988	Primary		Infiltration		
Bastia - Nord	20.23	20.23	20.23	Yes	1990	Primary		SO		
Bastia Sud	30.54	30.54	30.54	Yes	2001	Secondary	3,256	SO		
Berre l'Etang	11.78	11.78	11.78	Yes	1936	Secondary	2,688	Water bodies		
Bonifacio	10.67	8	8	Yes	1983	Primary		SO		
Borgo ***	16.24	16.24	16.24	Yes	1993	Primary	2,402	SO		
Bormes-les-Mimosas-le Lavandou **	62.80	62.80	62.80	Yes	1969	Primary	7,717	SO		
Cagnes-sur-Mer	139.08	130	130	Yes	1959	Secondary	18,750	SO		
Calvi	24.93	24.93	24.93	Yes	1995	Primary	4,289	SO		
Canet en Roussillon	52.12	52.12	52.12	Yes	1977	Secondary	7,907	River		
Cannes & Mandelieu	320.89	238	238	Yes	1977	Primary	56,548	SO		
Cassis	17.12	17.12	17.12	Yes	1979	Primary	2,222	SO		
Cavalaire **	65.97	50	50	Yes	1980	Primary	6,753	SO		
Collioure-Port Vendres	22.08	22.08	22.08	Yes	1994	Primary		SO		
Fos-sur-Mer	15.09	15.09	15.09	Yes	1976	Secondary	4,946	River		
Fejus	226.64	167	167	Yes	1983	Primary	29,216	River		

City	Permanent Population (in 000) *	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Fontignan	13.55	6.90	6.90	Yes	1984	Secondary	690	Water bodies		
Gisonaccia	10.33	10.33	10.33	Yes	1994	Secondary		SO		
Guissan	49.07	35	35	Yes	1984	Primary		SO		
Hyeres	111.80	91	91	Yes	1970	Secondary	20,913	SO		
Istres la Rmaniquette	14.09	14.09	14.09	Yes	1975	Secondary	3,956	Water bodies		
Istres Rassuen	22.71	22.71	22.71	Yes	1979	Secondary	4,826	SO		
La Ciotat	52.71	50	50	Yes	1990	Primary	8,527	SO		
La Grande Motte	72.56	72.56	72.56	Yes	1973	Secondary	7,805	River		
La Londe les Maures **	25.13	25.13	25.13	Yes	1981	Primary	3,134	SO		
Lattes	12.74	7.50	7.50	Yes	1978	Secondary		Water bodies		
Lavandou-le Rayol Canadel **	24.60	24.60	24.60	Yes	1987	Primary	2,251	SO		
Le Barcares	73.47	50	50	Yes	1977	Secondary	8,189	Infiltration		
Le Grau du Roi	115.83	100	100	Yes	1997	Secondary	13,026	Water bodies		
Leucate Port	44.69	44.69	44.69	Yes	1969	Secondary	4,180	Infiltration		
Marignane	44.70	44.70	44.70	Yes	1982	Secondary	13,727	River		
Marseille ***	955.04	955.04	955.04	Yes	1987	Primary	276,068	SO		
Martigues	63.25	63.25	63.25	Yes	1978	Secondary	11,603	Water bodies		
Menton	68.07	68.07	68.07	Yes	1995	Primary	11,217	SO		
Narbonne Plage	18.86	18.86	18.86	Yes	1996	Secondary	1,778	SO		
Nice	478.22	478.22	478.22	Yes	1988	Secondary	129,624	SO		
Palavas	25.23	25.23	25.23	Yes	1969	Secondary		SO		
Pietrosella-Cruciata	27.66	27	27	Yes	1995	Primary		SO		
Port la Nouvelle	24.79	24.79	24.79	Yes	1986	Primary	2,231	Water bodies		
Porto-Vecchio	26.88	20	20	Yes	1985	Secondary		SO		
Propriano	16.17	15	15	Yes	1977	Primary		SO		

City	Permanent Population (in 000) *	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Ramatuelle	17.46	17.46	17.46	Yes	1983	Secondary	2,041	SO		
Rognac	11.47	11.47	11.47	Yes	2000	Secondary	1,738	Water bodies		
Roquebrune Cap Martin	31.65			No				SO		
Roquebrune/Argensis-ambres	25.33	23	23	Yes	1981	Primary	2,531	SO		
Saint Chamas	30.51	30.51	30.51	Yes	1982	Secondary	8,635	Water bodies		
Sainte Maxime ***	45.50	45.50	45.50	Yes	1983	Primary	5,534	SO		
Saintes Maries de la Mer	15.54	15.54	15.54	Yes	1979	Secondary		Water bodies		
Saint-Tropez	39.79	39.79	39.79	Yes	1969	Secondary	5,140	SO		
Sanary-Bandol	69.12	68	68	Yes	1999	Secondary	10,020	SO		
Santa Maria Poggio Murianincu	14.27	10	10	Yes	1987	Secondary	1,887	SO		
Sausset les Pins ***	20.49	18.50	18.50	Yes	1986	Primary	2,861	SO		
Sete	102.95	102.95	102.95	Yes	1972	Secondary	23,699	SO		
St Cyprien	68.78	68.78	68.78	Yes	1995	Secondary	8,490	SO		
St Cyr-sur-Mer	29.53	23	23	Yes	1989	Primary	3,425	SO		
St Laurent-du-Var	53.83	53.83	53.83	Yes	1982	Secondary	14,330	River		
St Raphael ***	27.43	25	25	Yes	1983	Primary	3,501	SO		
Ste Marie la Mer	18.32	18	18	Yes	1994	Secondary	2,443	River		
Toulon – Est ***	83.68	83.68	83.68	Yes	1983	Primary	24,847	SO		
Toulon Cap-Sicie	323.38	323.38	323.38	Yes	1997	Secondary	60,941	SO		
Vallauris	50.51	50	50	Yes	1981	Primary	6,315	SO		
Valras Plage	21.65	21.65	21.65	Yes	1958	Secondary		SO		
Vendres zone littorale	11.34	8	8	Yes	1987	Secondary		Water bodies		

City	Permanent Population (in 000) *	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Villefranche-sur-Mer	14.61			No				SO		
Vitrolles	41.86	41.86	41.86	Yes	1974	Secondary	9,345	River		
Zonza-plaine de Ste Lucie	13.65	13.65	13.65	Yes	1989	Secondary		River		
Remarks: * The figure in the column "Permanent Population" represents the population equivalent of the coastal area, i.e. permanent and seasonal. ** Partly biological treatment *** Project in progress										

Data reported by the MED POL National Coordinator

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: GREECE

City	Permanent Population (in 000) *	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m ³ /day)	Discharge of Treated Wastewater	Wastewater Untreated (m ³ /day)	Discharge of Untreated Wastewater **
		Plant+ Network	Network							
Ag. Nicolaos Lassithiou	17	17	12.8	Yes	1990	Secondary	2000		650	
Aigio	27	27	27	Yes	2002	Secondary	6750	SO		
Alexandroupoli	70	70	52.5	Yes	1992	Secondary	11000		3500	
Alikarnassos	11.5			No					2300	
Amaliada	20.5	20.5	16.4	Yes	1996	Secondary	4600	DI through stream	800	
Argos-Nafplio	60	60	60	Yes	1997	Tertiary	10000	SO		
Argostoli	18	18	16.2	Yes	1995	Secondary	3500		350	
Artemida***	44			No					8800	
Athens	3500	3500	3500	Yes	1994/2004	Primary/Secondary	800000	SO		
Chalkida	56	56	39.2	Yes	1986	Tertiary	9200	SO	3400	
Chania	85	85	82.5	Yes	1995	Secondary	16500	SO	500	
Chersonissos	30	30	21	Yes	2001	Tertiary	5500	SO	1800	
Chios	32	32	27.2	Yes	1994	Secondary	7600	SO	800	
Elefsina****	120			No					24000	
Ermoupolis	21.5	21.5	20.4	Yes	2001	Secondary	4200		250	
Ierapetra	18	18	12.6	Yes	2002	Secondary	3500	SO	1200	
Igoumenitsa	30	30	27	Yes	2002	Secondary	7800	SO	600	
Iraklio	150	150	125	Yes	1996	Secondary	25200	SO	5000	
Kalamata	80	80	60	Yes	1986	Secondary	16000	SO	4000	

City	Permanent Population (in 000) *	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater **
		Plant+ Network	Network							
Kallithea Chalkidikis	15	15	15	Yes	1997	Secondary	3000	SO		
Kalymnos	20			No					4000	
Katerini	80		60	Yes	1991	Secondary			16000	
Kato Achaia	16	16	12.2	Yes	1995	Secondary	3500	SO	700	
Kavala	80	80	80	Yes	1990	Secondary	15000	SO		
Kerkyra (Corfu)	60	60	48	Yes	1996	Secondary	10000	SO	2400	
Kiato	23	23	16.1	Yes	1996	Tertiary	2000	SO	1400	
Korinthos-Loutraki	45	45	40.5	Yes	2000	Secondary	9500	SO	900	
Kos	33	33	31.4	Yes	1991	Secondary	6280	SO	320	
Lamia	65	65	65	Yes	1995	Secondary	14000	DI through stream		
Lefkada	10	10	10	Yes	1997	Tertiary	2000	DI		
Lefkimmi	18	18	10.8	Yes	2002	Secondary	2160	SO	1440	
Litochoro	70		70	Yes	2003	Constructed but not yet in operation			14000	
Mallia	15			No					3000	
Markopoulo	17			Yes	1999	Constructed but not fully operational			3400	
Megara	40			Yes	1999	Constructed but not fully operational			8000	
Mesologgi	14	14	9.8	Yes	1976/2002	Tertiary	2000	DI through stream	840	
Metamorfosi (Athens, north area)	265	265	80% septic sewage, 20% sewerage network	Yes	1986	Secondary	21000	DI through stream and via Psyttalia WWTP (Athens)		
Mykonos	16	16	15.2	Yes	1996	Secondary	3040		160	
Mytelene	30	30	21	Yes	2002	Secondary	4200	SO	1800	
N. Kydonia	30		7.8	No					6000	

City	Permanent Population (in 000) *	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater **
		Plant+ Network	Network							
Nafpaktos	20	20	10.8	Yes	2000		2500		1800	
Naousa Parou	18	18	15.3	Yes	1994	Secondary	3000		550	
Naxos	17	17	17	Yes	2001	Tertiary	3500			
Nea Kallikrateia	30	30	21	Yes	1994	Secondary	4200		1800	
Nea Makri	29.5			No					5900	
Paroikia Parou	17	17	11.9	Yes	2001	Secondary	2500		1000	
Patras	180	180	153	Yes	2002	Secondary	43200	SO	2400	
Poros	15			No					3000	
Potamia Thasou	20	20	14	Yes	1998		2800		1200	
Preveza	25	25	12.5	Yes	2001	Secondary	2500	DI	2500	
Pyrgos	35	35	35	Yes	2002	Secondary	10100	DI through river		
Rafina****	19			No					3800	
Rethymno	50	50	35	Yes	1995	Secondary	7000	SO	3000	
Rhodes	120	120	84	Yes	1999	Tertiary	16800	SO	7200	
	30	30		Yes (Septic sewage)	1992	Secondary	6000	SO		
Siteia	15	15	10.5	Yes	2002	Secondary	2100		1000	
Skiathos	21	21	18.9	Yes	1998	Secondary	4620		450	
Thessaloniki	900	900	860	Yes	2000	Secondary	125000	SO	8000	
Thira (Mesaria)	20	20	14	Yes			2800		1200	
Tolo	16	16	11.2	Yes	1999	Secondary	2240		1000	
Greater Thessaloniki area	87	87		Yes (septic sewage)	1997	Secondary	12500	SO		
Volos	135	135	128.3	Yes	1996	Secondary	28000	SO	1350	

City	Permanent Population (in 000) *	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater **
		Plant+ Network	Network							
Xylokastro	20	20	19.6	Yes	1996	Secondary	3920	SO	100	
Zakinthos	15.3	15.3	7.7	Yes	1997	Secondary	2000		1500	

Remarks:

* The figure in the column "Permanent Population" represents the population equivalent of the coastal area, i.e. permanent and seasonal population and/or permanent and seasonal population and population equivalent (p.e.) due to industrial load (as in the cases of Athens, Elefsina and Volos).

** Untreated sewage is not directly discharged to coastal areas. In most cases raw sewage from households is collected to septic tanks. One part of the sewage is being filtered in the ground and another is transported to wastewater treatment plants for treatment and disposal.

*** With respect to the coastal areas of Artemida and Rafina, the Water and Sewerage Corporation of Athens has programmed the construction of a new wastewater treatment plant that will receive domestic wastewater from these areas.

**** With respect to the coastal area of Elefsina, the Water and Sewerage Corporation of Athens has programmed the construction of a new wastewater treatment plant that will receive both domestic and industrial wastewater from the areas of Elefsina, Aspropyrgos and Marnda.

Data reported by the MED POL National Coordinator

**MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: ISRAEL**

City	Permanent Population (in 1000)	Population Served (In 1000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Akko	45	45		Yes	1993	Primary	12,000	SO	-	-
Ashdod	200	200		Yes	1962/2001	Secondary	30,000	RE	-	-
Ashqelon	115	115		Yes	1968/2000	Secondary	22,000	RE	-	-
Gush-Dan/Shafdan* (Tel Aviv area)	2,200	2,200		Yes	1985/1997	Secondary	340,000	RE	-	-
Hadera	70	70		Yes	1981/1997	Secondary	26,000	RE + River	-	-
Haifa	700	700		Yes	1965/1998	Secondary	104,000	RE + River	-	-
Herzlia	100	100		Yes	1977/1999	Secondary	20,000	SO	-	-
Nahariyya	45	45		Yes	1991	Primary	12,000	SO	-	-
Netanya	165	165		Yes	1976/1995	Secondary	36,000	RE	-	-
Remarks: * Shafdan = Sewage sludge (13,500m³/day, 1.2% TSS, Outfall)										

Data reported by the MED POL National Coordinator

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: ITALY

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Aci Castello (Sicily)	19.487			On projection	-	-	-			
				On projection	-	-	-			
Agrigento	55.446			Yes	-	Secondary	-			
				Yes	-	Secondary	-			
				Yes	-	Secondary	-			
				Yes	-	Secondary	-			
Agropoli	19.495	55		Yes	-	-	11,000			
Alassio	11.364	15		Forecasted	-	Secondary	0			
Albenga	22.759	23		Under construction	-	Secondary	0			
Alghero	40.562			Yes	1/1/76	-	-			
Amantea	13.409			Yes	9/9/82	Secondary	-			
Ancona	98.404	80		On projection	25/12/85	Tertiary	38,400			
Anzio	43.568	3		-	1/1/89	-	-			
		46		Yes	1/1/94	-	-			
		40		Yes	-	-	-			
Augusta	34.063			Under construction	-	None	-			
Avola	31.731			No	-	None	-			
Bagheria	54.283	40		Yes	-	Primary	-			
Bagnara Calabria	11.101	15		Yes	10/4/97	None	3,000			
Barcellona Pozzo di Gotto	41.348	43.50		Yes	-	Primary	-			
				Forecasted	-	Primary	-			
Bari	332.143	613.24		Yes	1/1/80	-	-			
		323.50		Yes	1/1/80	-	-			
Barletta	92.305	148.80		Yes	1/1/92	-	-			
Bellaria-Igea Marina	14.697	95.30		Yes	1/1/72	-	-			

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Bisceglie	51.152	60.26		Yes	1/1/76	Secondary	-			
Bordighera	10.735	15		Yes	1/8/94	-	12,600			
Borghetto Santo Spirito	5.237	20		Under construction	-	-	-			
Brindisi	93.013	9.34		Yes	1/1/51	Secondary	-			
		48		Yes	1/1/88	Secondary	-			
		3.79		Yes	1/1/79	Secondary	-			
Cagliari	162.993			Yes	1/1/90	Primary	-			
Camerano	6.442	21		Yes	1/1/89	-	7,000			
Caorle	11.506	120		Yes	-	Tertiary	-			
				Yes	-	Tertiary	-			
Capo d'Orlando	12.755	15		-	-	Primary	-			
Cariati	8.713			Yes	9/9/80	Primary	-			
Carovigno	15.419	18.95		Yes	1/1/56	Primary	-			
Catania	336.222	350		Yes	-	-	-			
Cattolica	15.752	87.47		Yes	1/1/72	-	-			
Cecina	26.464	38.50		Yes	1/7/86	-	11,550			
Cervia	25.600	142.85		Yes	1/1/68	Tertiary	-			
Cesenatico	21.887	88.72		Yes	1/1/74	-	-			
Chiavari	28.023	33		Yes	1/1/73	-	9,100			
Chioggia	51.898	105		Yes	-	Secondary	20,000			
Ciro` Marina	13.664			Yes	-	-	-			
Civitanova Marche	39.018	80		Yes	9/9/88	Primary	-			
Civitavecchia	50.902	48.85		Yes	-	-	-			
Crotone	59.757			Yes	9/9/74	Secondary	-			
Falconara Marittima	28.475	62		On projection	22/7/88	Secondary	18,700			
Fano	56.727	40		Yes	1/1/81	Primary	10,000			
		15		Yes	1/1/81	Primary	4,000			
Finale Ligure	12.300	35		Yes	-	Secondary	-			
Floridia	20.767			No	-	-	-			
Follonica	21.680	104		Yes	-	-	7,000			

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Formia	36.863	70		Yes	1/1/87	Secondary	-			
Forte dei Marmi	8.617			Yes	-	-	-			
Francavilla al mare	24.654	35		Yes	-	Secondary	5,640			
		30		Yes	-	Secondary	4,800			
Gaeta	22.515	55		Yes	-	-	-			
Gallipoli	21.089			Yes	10/12/02	-	-			
Genova	632.366			Under construction	-	Secondary	-			
		130		Out of order	-	Secondary	34,100			
		125		Yes	1/3/80	Secondary	33,000			
		59		Yes	-	Secondary	-			
		220		Yes	1/10/92	Secondary	56,100			
		60		Under construction	-	Secondary	19,200			
		60		Out of order	1/1/97	Secondary	13,800			
		300		Yes	1/1/80	Secondary	72,000			
Gioia Tauro	18.416			Yes	9/9/95	-	-			
Giovinazzo	20.858	13.29		Yes	1/1/88	Secondary	-			
Giulianova	22.104	35		Yes	1/1/80	Secondary	7,000			
Grado	8.926	53.27		Yes	1/1/82	Primary	10,087			
Grottammare	14.272	30		Yes	10/12/70	Secondary	7,500			
Isoleo	22.936	125		Yes	1/1/73	Secondary	-			
Imperia	40.252	40		Under construction	-	-	-			
La Maddalena	11.653			Yes	1/1/96	-	-			
				Yes	1/1/91	-	-			
La Spezia	95.091	59		Yes	1/1/87	Secondary	13,865			
Ladispoli	27.316	22.85		Yes	-	-	-			
Lavagna	12.985	18		Yes	5/1/01	Primary	7,000			
Lerici	11.757	35		Yes	-	Secondary	5,300			
Livorno	161.288	235		Yes	1/7/86	Secondary	38,000			
		5		-	1/7/89	Secondary	1,000			
Manfredonia	57.864	50.32		Yes	1/1/83	-	-			

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Margherita di Savoia	12.790			Yes	1/1/77	-	-			
Messina	257.302	10		Yes	-	Unknown	-			
		160		Yes	-	Unknown	-			
Milazzo	32.586	25		Yes	-	Primary	-			
Mola di Bari	26.623	38.84		Yes	1/1/00	Secondary	-			
Molfetta	63.401	97.72		Yes	1/1/87	Tertiary	-			
Monopoli	48.581	38		Yes	1/1/99	Tertiary	-			
Napoli	1,000.470	800		Yes	1/10/98	-	138,240			
Nettuno	39.290	80		Yes	1/1/95	-	-			
Olbia	44.837			Yes	1/1/86	-	-			
				Yes	-	-	-			
Orbetello	15.236	15		Yes	-	-	8,000			
		4		Yes	1/1/76	-	800			
		4		Yes	1/1/82	-	800			
				No	-	None	-			
Ortona	23.527	18		Yes	1/1/78	Secondary	3,400			
Otranto	5.341	10.75		Yes	1/1/92	Secondary	-			
Pachino	21.732	20		-	-	Unknown	-			
Palermo	679.290			Yes	-	Secondary	-			
				Yes	-	Secondary	-			
Patti	13.270			Under construction	-	None	-			
				On projection	-	None	-			
Pesaro	89.408	70		Yes	-	Primary	7,500			
Pescara	115.448	105		Yes	1/1/86	Tertiary	35,000			
		90		Yes	-	Tertiary	-			
Pietrasanta	24.397	80		Yes	-	-	20,000			
Pineto	13.210	48		Yes	1/1/80	Secondary	10,000			
Piombino	34.521	20		Yes	1/7/00	-	6,984			
		3		-	1/7/01	-	400			
		2.50		-	1/7/98	-	400			

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Polignano a mare	16.757	27.79		Yes	1/1/98	Tertiary	-			
Porto Empedocle	17.223	0.50		No	-	None	-			
				No	-	None	-			
Porto San Giorgio	16.080	30		Yes	-	Secondary	280			
Portoferraio	11.999	2		-	1/1/90	-	500			
		1.50		-	1/1/96	-	375			
Pozzallo	18.078			-	-	Primary	-			
Rapallo	29.357	30		Forecasted	-	Primary	-			
Ravenna	139.771	153.89		Yes	1/1/83	Tertiary	-			
		37.53		Yes	1/1/76	Tertiary	-			
		24.05		Yes	1/1/78	Tertiary	-			
Reggio di Calabria	179.509			Yes	9/9/83	-	-			
		20		Yes	9/9/80	-	4,000			
		20		Yes	-	-	4,000			
Riccione	34.180	143.02		Yes	1/1/70	-	-			
Rimini	131.705	218.79		Yes	1/1/71	-	-			
		152.35		Yes	1/1/96	-	-			
Rosignano Marittimo	30.495	25		Yes	1/7/88	-	7,680			
				-	1/7/70	-	-			
				-	1/7/70	-	-			
Sabaudia	16.548	28		Yes	1/1/80	-	-			
		1		-	1/1/80	-	-			
		2		-	1/1/80	None	-			
		1.65		No	-	None	-			
San Benedetto del Tronto	45.435	180		Yes	20/8/78	Secondary	40,000			
San Remo	55.974	65		Yes	1/1/92	-	19,700			
Sant'Antioco	11.762			Yes	1/1/92	-	-			
Santa Marinella	16.688	25		Yes	-	-	-			
		37.50		Yes	-	-	-			
		7.70		Yes	-	-	-			

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Savona	61.911	120		Yes	1/1/89	Secondary	48,000			
Sciacca	41.162			Forecasted	-	None	-			
Senigallia	42.605	90		Yes	1/1/74	Secondary	18,000			
Sestri Levante	19.470	15		Yes	1/7/97	Primary	-			
Siderno	17.245			Yes	9/9/96	-	-			
Soverato	10.689	27		Yes	-	Primary	-			
Taranto	207.199	121.64		Yes	1/1/99	Unknown	-			
		225		Yes	-	Unknown	-			
		15.64		Yes	1/1/76	Unknown	-			
Termini Imerese	27.923	20		Yes	-	Primary	-			
				On projection	-	Primary	-			
Termoli	30.593			Yes	6/8/86	Secondary	5,000			
				Yes	-	Secondary	-			
				Yes	1/11/01	Secondary	-			
Terracina	38.867	65		Yes	1/1/76	Secondary	-			
		2		Yes	-	Secondary	-			
Tortoreto	8.280	20		Yes	1/1/80	-	4,000			
Trani	53.923	70.84		Yes	1/1/91	Tertiary	-			
Trapani	69.221			Under construction	-	None	-			
				On projection	-	None	-			
				On projection	-	None	-			
Trieste	215.096	170		Yes	1/1/91	Secondary	110,000			
		59		Yes	1/1/97	Secondary	30,000			
		10		Yes	1/1/73	Secondary	4,000			
Vasto	35.145			Yes	-	Secondary	-			
Venezia	275.368	95		Yes	1/1/83	Tertiary	23,500			
		13		Yes	1/1/82	Tertiary	4,280			
		332.45		Yes	1/1/86	Tertiary	104,943			
		110		Yes	1/1/83	Tertiary	43,890			
				Yes	-	Tertiary	-			

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Ventimiglia	26.725	36		Yes	1/1/92	-	7,900			
Viareggio	58.884	54		Yes	30/6/74	-	21,000			
Vieste	13.514	15.28		Yes	1/1/84	Secondary	-			
Vietri sul Mare	8.965	35		Yes	-	-	7,000			
Villa San Giovanni	12.420			No	-	None	-			

Data reported by the MED POL National Coordinator

**MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: LEBANON**

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Batroun	51		51	No		-	-	-	6,120	Ss
Beirut Greater Area	1,200	720	880	Yes		Primary	87,000	SO	105,000	Ss
Jounieh	200		200	No		-	-	-	2,400	Ss
Jubayl, (Jbail), (Byblos)	66		66	No		-	-	-	7,920	Ss
Saida - Ghaziye (Sidon)	205		205	No		-	-	-	24,600	DI
Sour (Sur or Tyre)	181		181	No		-	-	-	21,720	Ss
Tripoli - (Tarabalus)	353		353	No		-	-	-	42,360	-

Data reported by the MED POL National Coordinator

**MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: LIBYA**

City	Permanent Population (in 000)	Population Served (in 000)	Capacity m3/day	Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
Al Bayda	120	60		Yes	1980	Secondary	7,000	RE	-	-
Al-Brega	75	23		Yes	1990	Tertiary	3,500	-	-	-
Al Khums	350	40	8,000	Under construction		-	8,000	-	-	-
Al Garabulli	80			No	-	-	-	-	-	-
Az Zawiyah	280	66		Yes*	1987	Secondary	13,200	-	-	-
Benghazi	750	300	54,000	Yes*	1975	Secondary	54,000	-	14,000	-
Darnah	105	47.3	16,500	Yes**	1987	Secondary	16,500	-	-	-
Ajdabia	85	75	15,400	Yes		Secondary	15,000	-	2,000	-
Misratah	178	55		Yes		Tertiary	25,360	-	-	-
Sabratah	40	35	6,000	Yes*		Secondary	6,000	-	-	-
Sirt	327	35	1) 6,000 2) 4,200	Yes Under Construction		Secondary Secondary	10,200	-	-	-
Surman	39		4,000	Yes	Under Construction (Secondary)		-	-	-	-
Tripoli	1,200	960	137,000	Yes**	1982	Secondary	-	RE	-	Ss + DI
Tubruq	95	90		Yes	1985	Secondary	33,000	RE	-	-
Janzour	69	40	2,000	Yes	Under Construction (Secondary)				-	-
Zlitin	101	26	6,000	Yes*	1987	Secondary	6,000	RE	-	-
Zuwarah	168	20		Yes	1987	Secondary	12,000	RE	-	-
Remarks: * On maintenance ** Out of order										

Data reported by the MED POL National Coordinator

**MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: MALTA**

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
B'Kara*	22.2	22.2		Yes (Sant'Antnin STP)	1983	Tertiary	*(17,000)	RE	-	-
Fgura*	11.8	11.8								
Hamrun*	11.2	11.2								
Mosta*	17.8	17.8								
Qormi*	18.5	18.5								
Rabat*	11.7	11.7								
Zebbug*	11	11								
Gozo + Comino	30.8		30.8	No (Will be connected to Gozo STP)		-	-	-	** (75,000)	SO
Gzira/Ta'Xbiex**	9.8		9.8	No (Will be connected to Malta South STP)		-	-	-	** (75,000)	SO
Paola**	9.5	9.5								-
S Gwann**	12.6		12.6							-
Sliema**	12.5		12.5							SO
St. Julian's**	7.5		7.5							SO
Zabbar**	15		15							SO
Zejtun**	11.7		11.7							SO
Remarks: * All these cities are served by the same wastewater treatment plant which commenced operation in 1983 and treats about 17,000 cu.mt of wastewater per day ** Cities served by different sewerage networks discharging a total of 75,000 cu.mt of wastewater per day through submarine outfalls: two in Malta (Ic-Cumnija and Wied Ghammieg), and one at Ras il-Hobz on Gozo Island. By 2007, all sewage will be treated, following the construction of a sewage treatment plant for Malta South (Wied Ghammieg), another for Malta North, and another for Gozo.										

Data reported by the MED POL Coordinator (source: Dir. of Environment Protection and Drainage Departments)

**MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: MONACO**

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
					1987	Pre-treatment	19,000	SO	1,500 **	SO
Total for MONACO (*)	35	70	0	Yes	1990	Secondary	17,500	SO	0	-
Remarks: * The plant also treats wastewater from nearby coastal areas of France containing 40,000 inhabitants. The indicated values are the means within the year. ** The discharge of untreated wastewater corresponds to the excess flow that enter the wastewater treatment plant during highly unusual cases.										

Data reported by the MED POL National Coordinator

**MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: MOROCCO**

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Nador	193.35	100	45.01	Yes	1978/91	Tertiary	10 000	DI	4,800	DI
Kariat Arekmane	13.53		10.15	No					732	DI
Beni Ansar	33 308		9.99	No					2,500	* FS + DI
Al-Hoceima	70.12	57.55	12.63	Yes		Tertiary	5 750	DI	950	DI
Bni Bouayach	20.33		10.16	No					1,600	* FS + DI
Imzouren	39.05		25.38	No					3,100	* FS + DI
Tétouan	332.71		232.90	No	On project				23,290	DI
Fnideq	52.47		47.22	No					3,541	DI
Martil	35.20		31.64	No					2,376	DI
M'diq	33.41		30.07	No					2,255	DI
Oued Laou	9.90		8.91	No					624	DI
Tanger	639.85		447.90	No	On project		-	-	33,123	DI
Remarks: * FS: Septic Tank										

Data reported by the MED POL National Coordinator

**MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: SLOVENIA**

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Izola	13		12	No		-	-	-	4,990	Ss
Koper	46	25	21	Yes	1992	Primary	12,700 *	DI/River	2,600	DI + Ss
Piran	17	15	2	Yes	1986/92	Primary	10,300**	SO	600	-
Remarks: * <i>Direct measurement</i> ** <i>Estimated on the basis of the pumps operation time</i>										

Data reported by the MED POL National Coordinator

**MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: SPAIN**

City	Permanent Population (in 000)	Population Equivalent (in 000)	Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
Adra	19	31.4	Yes	2000	Tertiary*				
Aquilas	24.8	59.6	Yes	1997	Tertiary*				
Algeciras	100.6	174.5	No						
Alicante (North)	97.9	253.9	Yes	1989	Secondary				
Alicante (South)	224.6	490.9	Yes	1981	Secondary				
Almazora	15.3	43.9	Yes	2000	Secondary				
Almeria	153.6	275.4	Yes	1997	Tertiary*				
Almunecar	16.1	110	Yes		Secondary				
Altea	12.3	45.6	Yes	1987	Secondary				
Arenis de Mar	24.2	46.7	Yes		Secondary				
Barcelona	1,206.3	1,707.9	Yes		Secondary				
Benalmadena	23.1	205.8	Yes	1987	Secondary				
Benicarlo	16.5	46.5	Yes	1991	Pretreatment				
Benidorm	73.8	347	Yes	1984	Secondary				
Blanes	25.5	61.2	Yes	1998	Secondary				
Burriana	24.4	49	Yes	1984/2001	Secondary				
Calpe	11	56.3	Yes	1999	Tertiary*				
Calvia	30.7	278.9	Yes (4)	1975 (1) 1998 (3)	Secondary (1) Tertiary (3)				
Cambrils	14.5	80.1	Yes	1997	Secondary				
Cartagena	135.7	246.5	Yes	2001	Secondary				
Castell – Playa de Aro	22.1	87.8	Yes	1983	Secondary				
Castellon de la Plana	133.3	156.9	Yes		Tertiary*				
Ceuta	73.2	142.8	No						

City	Permanent Population (in 000)	Population Equivalent (in 000)	Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
Ciudadela (North)	0.90	16.5	Yes	1991	Secondary				
Ciudadela (South)	17	57.4	Yes	1991	Tertiary*				
Cullera	20.5	120.4	Yes	2000	Tertiary*				
Deltebre	10	11.5	Yes		Secondary				
Denia	35.5	97	Yes	1997	Secondary				
Eivissa (Ibiza)	29.2	83.4	Yes	1992	Tertiary*				
El Vendrell (Santa Oliva)	18.4	71.1	Yes		Secondary				
Estepona	58.9	217	Yes		Secondary				
Fuengirola	64.3	215.9	Yes	1980	Secondary				
Gandia	76.9	229.8	Yes	2000	Secondary				
Javea / Xabia	16.6	42	Yes	1999	Tertiary*				
La Linea de la Concepcion	57.6	98.2	Yes		Primary				
Lloret de Mar	14.3	73.6	Yes	1992	Secondary				
Mahon (Menorca)	23.6	43.2	Yes	2000	Tertiary*				
Malaga (West)	460.1	806.2	Yes	1999	Secondary				
Malaga	101.5	172.2	Yes		Secondary				
Marbella	63	282.8	Yes	1975	Secondary				
Mataro	132.4	205.4	Yes	1997	Secondary				
Melilla	63.7	124.2	Yes		Secondary				
Motril - Salobrena	52.3	140	Yes		Secondary				
Nerja	13.3	34.2	No						
Nules	14.9	45	Yes	1998	Secondary				
Oliva	20.3	63.7	Yes	1974	Secondary				
Palamos (Mont-Ras))	36.5	126.2	Yes	1985	Secondary				
Palmas del Mallorca	15	28	Yes		Tertiary*				
Palmas del Mallorca	281.4	481.5	Yes	1974	Tertiary*				
Pineda (de Mar)	42.4	160.5	Yes		Secondary				
Pollenca	10.1	30	Yes	1993	Tertiary*				

City	Permanent Population (in 000)	Population Equivalent (in 000)	Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
Roquetas de Mar	37	183.3	Yes	1974	Tertiary*				
Sagunto (El Puerto de)	62.1	93.9	Yes	1979	Secondary				
San Adrian del Besos	1,383.1	1,727.6	Yes		Secondary				
San Carlos de la Rapital	10.7	20.4	Yes	1994	Tertiary*				
Santa Eulalia del Rio	3.6	24.5	Yes	1992	Secondary				
San Javier	14.2	72.8	Yes	1992	Secondary				
San Pedro del Pinatar	12.9	58.4	Yes	1990	Tertiary*				
San Pere de Ribes - Sitges	18.5	60.9	Yes	1997	Secondary				
Santa Pola	16.3	41.5	Yes	1985	Secondary				
Tabernes de la Valldigna	16.1	18.2	Yes	1999	Tertiary*				
Tarifa	11.1	20.6	Yes		Secondary				
Tarragona	95	219	Yes	1993	Secondary				
Torre Vieja	42.3	170.2	Yes	1982	Secondary				
Valencia	112	795.4	Yes	1982	Secondary				
Valencia	30.2	729.8	Yes	1993	Secondary				
Velez - Malaga	41.3	74.5	Yes	2002	Secondary				
Viladecans (incl. Castellfedels)	149.5	242.4	Yes	1996	Secondary				
Vilanova y la Geltru	53.6	86.9	Yes	1996	Secondary				
Vilaseca y Salou	30.9	168.2	Yes	1995	Secondary				
Villajoyosa	4.6	13.6	No						
Villajoyosa	22	67	Yes	1992	Secondary				
Vinaros	16.5	29	Yes	1993	Pretreatment				
Remarks: * Reported as more stringent treatment									

Data reported by the MED POL National Coordinator

**MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: SYRIA**

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Banias city	37	-	30	-	-	-	-	-	3,700	Ss
Hwaez, Burg Islam *	7.31	-	7.31	-	-	-	-	-	731.30	
Jableh	58.60	-	58.60	-	-	-	-	-	5,859.50	Ss
Karfis, Senao *	6.80	-	6.80	-	-	-	-	-	680	
Lattakia	387.73	-	387.737	-	-	-	-	-	38,772.70	Ss
Maten al Sahel *	3.20	-	1.80	-	-	-	-	-	320	-
Tartous	107	-	95	-	-	-	-	-	10,700	Ss
Remarks: * Included due to increased seasonal population										

Data reported by the MED POL National Coordinator

MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: TUNISIA

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater treatment plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Bizerte	103	139**	0	Bizerte	1997	Secondary	7,684	RE 153,68 DI 7530,32	13055	DI and aquifer
Gabès	209	107	0	Gabès	1995	Secondary	15,838	RE 3325,98 DI 12512,02	28570	DI and aquifer
Ghannouche	20			No		None			1658	
Hammamet	61	67**	0	SE1	1980	Secondary	13,016	RE 2901,08 SO 286,92	5652	DI and aquifer
				Hammamet South	1987	Secondary		DI 9828		
Jerba	120	40	80	Houmet Souk	1991	Secondary	14,439	RE 26,07 DI 2580,53	9941	DI and aquifer
				Tanit	1971	Secondary		RE 26,73 DI 54,27		
				Sidi Mehrez	1981	Secondary		RE 2300,66 DI 808,34		
				Aghir	2001	Tertiary		RE 169,44 DI 8302,56		
Kalaa El Andalous	13	9	0	Kalaat Landlous	1994	Tertiary	466	RE 37,28 DI 428,72	564	DI and aquifer
Kelibia	34	36**	0	Kelibia	1976	Secondary	3,932	DI 3932	n.a.	DI and aquifer
Korba	30	23	0	Korba	2002	Tertiary	4,782	DI 4782	n.a.	
Mahdia	153	78	75	Mahdia	1995	Secondary	4,674	DI 4674	19641	DI and aquifer
Mahres	13	12	0	Mahres	1994	Secondary	641	RE 96,15 DI 544,85	916	DI and aquifer
Menzel Bourguiba+Tinja	66	77	0	Menzel Bourguiba	1997	Secondary	5,601	DI 5601	6089	DI and aquifer
Menzel Temime	30			(Menzel Témime)	2004	Secondary	(10,348)	DI	9172	
Monastir	54	84**	0.0	El Gédhir	1962	Secondary	13,151	RE 2254 DI 46	7999	DI and aquifer
				Dékhila	1979	Secondary		RE 1293,9 DI 1459,1		
			0	Frina	1995	Secondary		RE 474,72 DI 5459,28		

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater treatment plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Nabeul	52	85**	0	SE3	1979	Secondary	11,711	RE 88,12 SO 2114,88	47710	DI and aquifer
				SE4	1981	Secondary		RE 5395,05 DI 4069,95		
				Sahline	1993	Secondary		RE 214,6 DI 1931,4		
Sayada	12	14**	0	Sayada	1993	Secondary	2,091	RE 167,28 DI 1923,72	n.a.	DI and aquifer
Sfax	462	369	3	Sfax*	1983/2004	Secondary	25,434+ (30,000)	RE 8647,56 DI 16786,44	43012	DI and aquifer
Soliman	34	19	0	Soliman*	1983/2003	Secondary	3,795+(12,300)	DI 3795	n.a.	DI and aquifer
Sousse	357	211	2	Sousse North	1978	Secondary	56,904	RE 3731,96 DI 25701,04	2583	DI and aquifer
					1980			RE 3945,28 D 20712,72		
				Sousse South*	1980	Secondary		RE 3945,28 DI 20712,72		
					Tabarka	1993		Tertiary		
Chebba	20.5			No			DI	450	DI and aquifer	
Skhira	27			No			DI	474	DI and aquifer	
Téboulba	25.4			No			DI	2237	DI and aquifer	
Enfidha+Hergla	38			(Enfidha)	2004	Secondary		DI	1271	DI and aquifer
Ras Jebel+5 communities	67			(Ras Jebel)	2004	Secondary	(10,000)	DI	2200	DI and aquifer
Korbous				(Korbous)	2004	Tertiary	(1,000)	DI		DI and aquifer
Haouaria	37			(Haouaria)	2004	Tertiary	(1,426)	DI		DI and aquifer
Bouargoub	25			('Bouargoub)	2004	Tertiary	(2,735)	DI		DI and aquifer
Mateur	45	37		(Mateur)	2003	Secondary	(4,300)	DI+RE		DI and aquifer
Tunis Centre	1,268	1172	8	Charguia	1958	Secondary	137,732	RE 16684,08 DI 23039,92	11966	DI and aquifer
				Choutrana*	1981	Secondary		RE 33322,72 DI 64685,28		
Tunis North	144	137	0	North coastal	1981	Tertiary	18,292	DI 18292	12918	DI and aquifer

City	Permanent Population (in 000)	Population Served (in 000)		Wastewater treatment plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Tunis South	366	331	41	Radès	1976	Secondary	57,733	DI 8679	11277	DI and aquifer
				South Méliane*	1982	Secondary		RE 6960,6 DI 39443,4		
				Grappée	2001	Secondary		DI 2395		
Zarzis	72	9	0	Souihel	1980	Secondary	2,332	DI 217	3720	DI and aquifer
				Lella Mériem	1982	Secondary		DI 1439		
				Zarzis Ville	1992	Secondary		RE 67,6 DI 608,4		

Remarks: * There is a programme to connect this part of the network with the treatment plants (In some cases work is actually under way, while for others it is still under study).
** In addition to the water system of the city, plants are also connected to water systems of tourist or industrial areas (for which water consumptions more important). This is why the number related to population served (population equivalent) in the second column, is higher than that of the permanent population (that of the cities), which is shown in the first column.
* Areas where besides existing wastewater treatment plants, there are others in the phase of extension or under study.

Data reported by the MED POL National Coordinator

**MUNICIPAL WASTEWATER TREATMENT FACILITIES
MEDITERRANEAN COASTAL CITIES WITH POPULATION OVER 10,000
Country: TURKEY**

City	Permanent Population (in 1000)	Population Served (In 1000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Alanya	88.35	70.68		Yes		Secondary	38,000	SO		
Aliaga	37.54		26.28	No					4630	DI
Anamur	49.95		34.96	No					4032	DI
Antalya (Main City)	603.19	180.96		Yes			33,000	SO		
Ayvalik	31.99	25.59		Yes		Primary	4,838	SO		
Beldibi	9.72	9.72		Yes		Secondary	301	SO		
Bitez	4.98	2.49		Yes		Secondary	1,151	Field		
Bodrum	33.23	29.90		Yes			17,534	SO		
Burhaniye	31.23	28.10		Yes		Primary	7,342	SO		
Çamyuva*	7.48	2.24		Yes		Secondary				
Canakkale	75.81		68.23	No					1233	DI
Cesme	25.26		6.31	No					521	DI
Dalaman	17.61	17.61		Yes		Secondary	5,699	River		
Dikili	12.56	10.05		No					1129	Field
Dortyol	53.60	21.44		No					150	River
Edremit	39.20	37.24		Yes		Secondary	13,260	SO		
Erdemli				No						
Fethiye	50.69	26.87		Yes			3,699	SO		
Finike				No						
Gazipasa	16.54	4.96		Yes		Secondary	1,728	River		
İçmeler	9.35		8.88	No					1175	Sewerage
İskenderun	159.15	127.32		Yes		Secondary	2,500	SO		

City	Permanent Population (in 1000)	Population Served (In 1000)		Wastewater Treatment Plant	Year of Construction	Degree of Treatment of Wastewater	Wastewater Treated (m3/day)	Discharge of Treated Wastewater	Wastewater Untreated (m3/day)	Discharge of Untreated Wastewater
		Plant+Network	Network							
Izmir	2232.27	2009.04		Yes		Tertiary	396,549	SO		
Kalkan										
Kemer*	17.26	10.35		Yes		Secondary				
Kızıltepe	113.14	33.94		No						
Kumluca	2.89									
Kusadasi	47.66	38.13		Yes		Primary	3,888	SO		
Manavgat	71.68	64.51		Yes		Primary	15,068	SO		
Marmaris	28.66		27.23	No					5000	DI
Mersin	537.84		527.09	Yes		Primary	144,000	SO		
Samandağı (Hatay)										
Sarıyerme										
Serik	30.58	9.17		Yes		Secondary	3,300	River		
Side (Titreyengöl)*	20.95	18.86		Yes						
Silifke*	64.83	51.86							5760	River
Tarsu	216.38	140.65		Yes		Secondary	27,000	Drainage Canal		
Türkbükü (GölTürkbükü)				Yes		Secondary	781	Field		
Yakacık	32									
Yenihisar										
Zeytinli-Güre-Akçay	10.89	10.68		Yes		Secondary	1,260	SO		

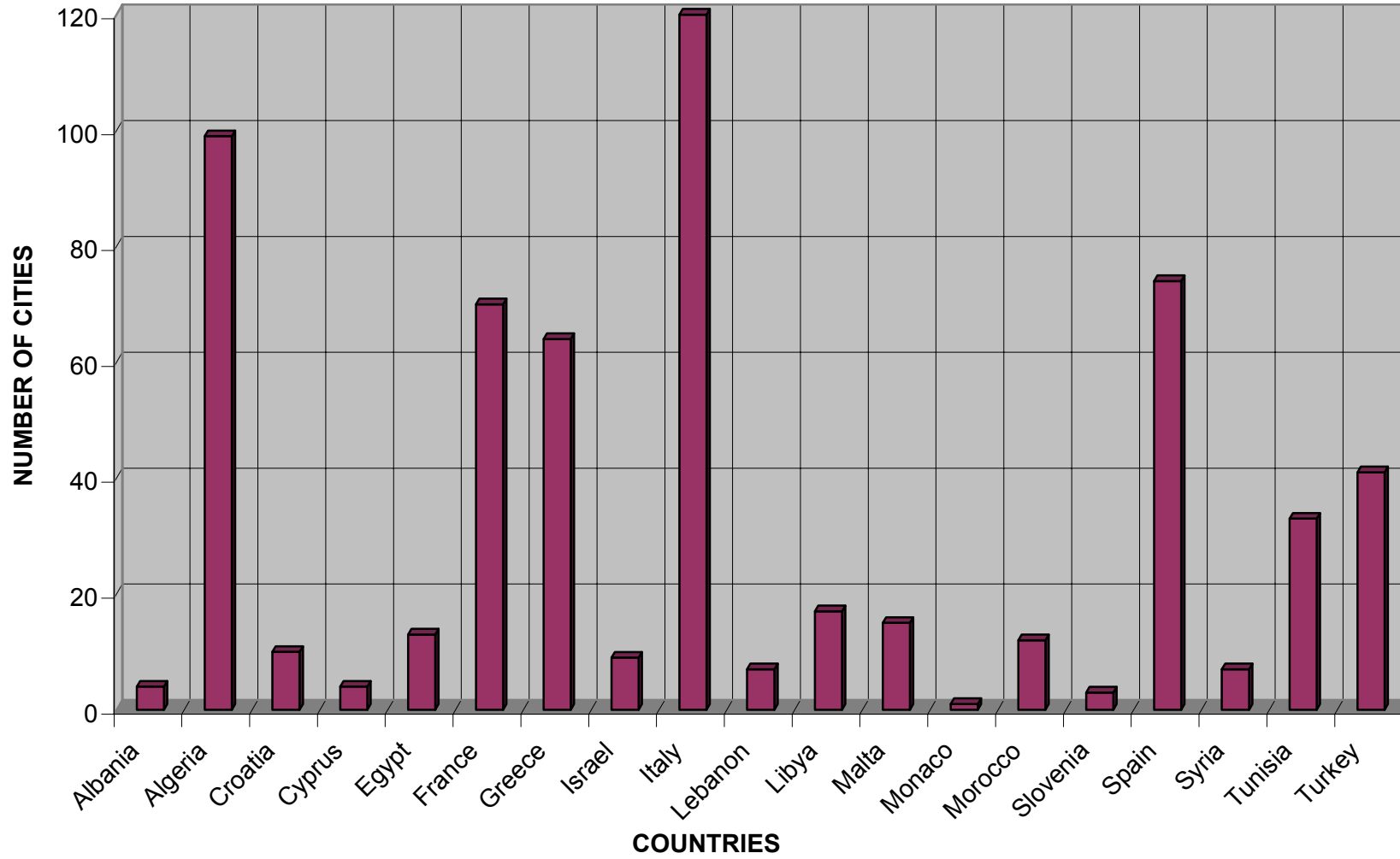
Remarks * Information is not available since wastewaters of these cities are treated in joint wastewater treatment plants

Data reported by the MED POL National Coordinator

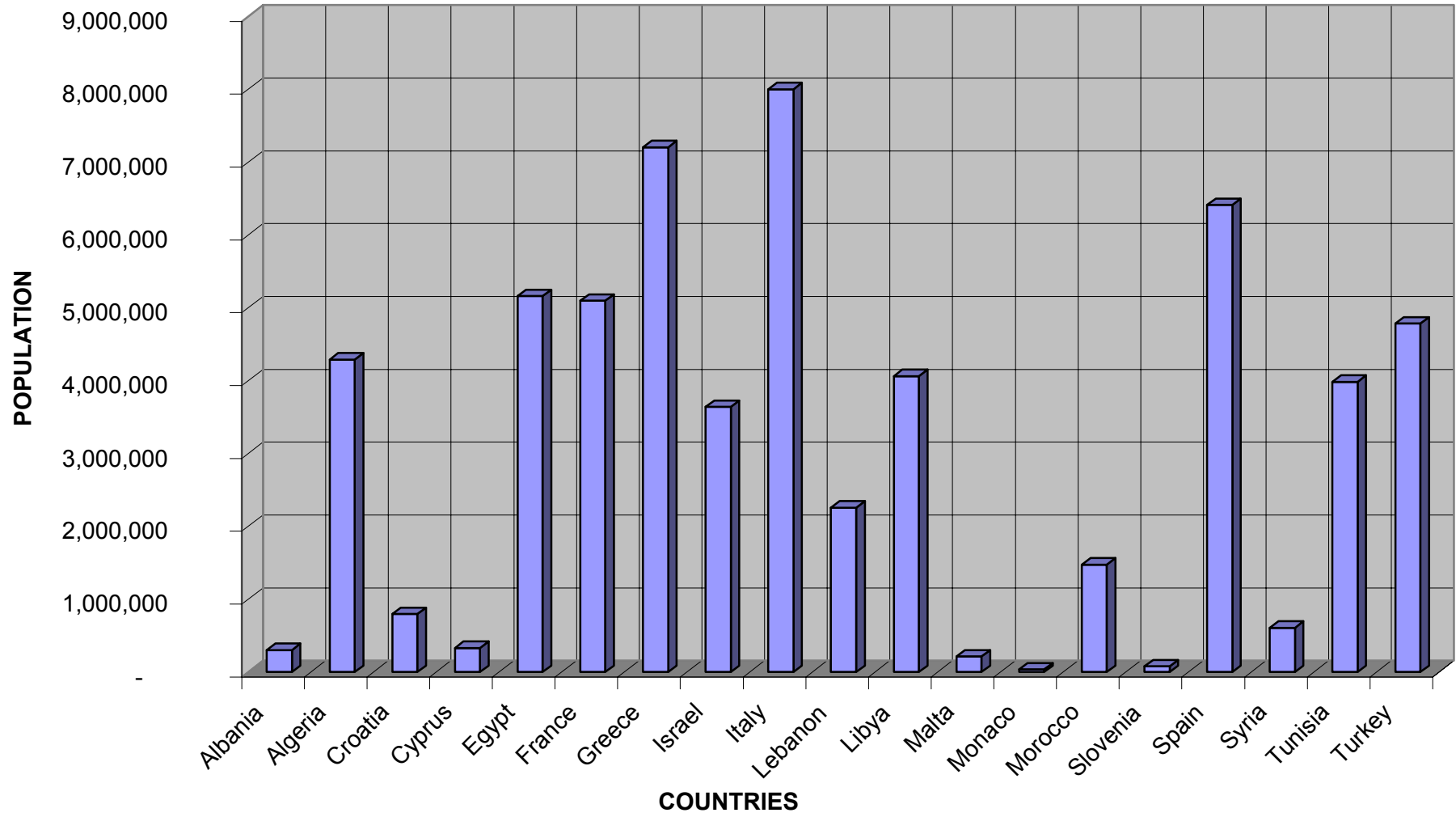
PART III

GRAPHS PRESENTING THE CURRENT SITUATION WITH RESPECT TO WASTEWATER TREATMENT PLANTS IN THE MEDITERRANEAN

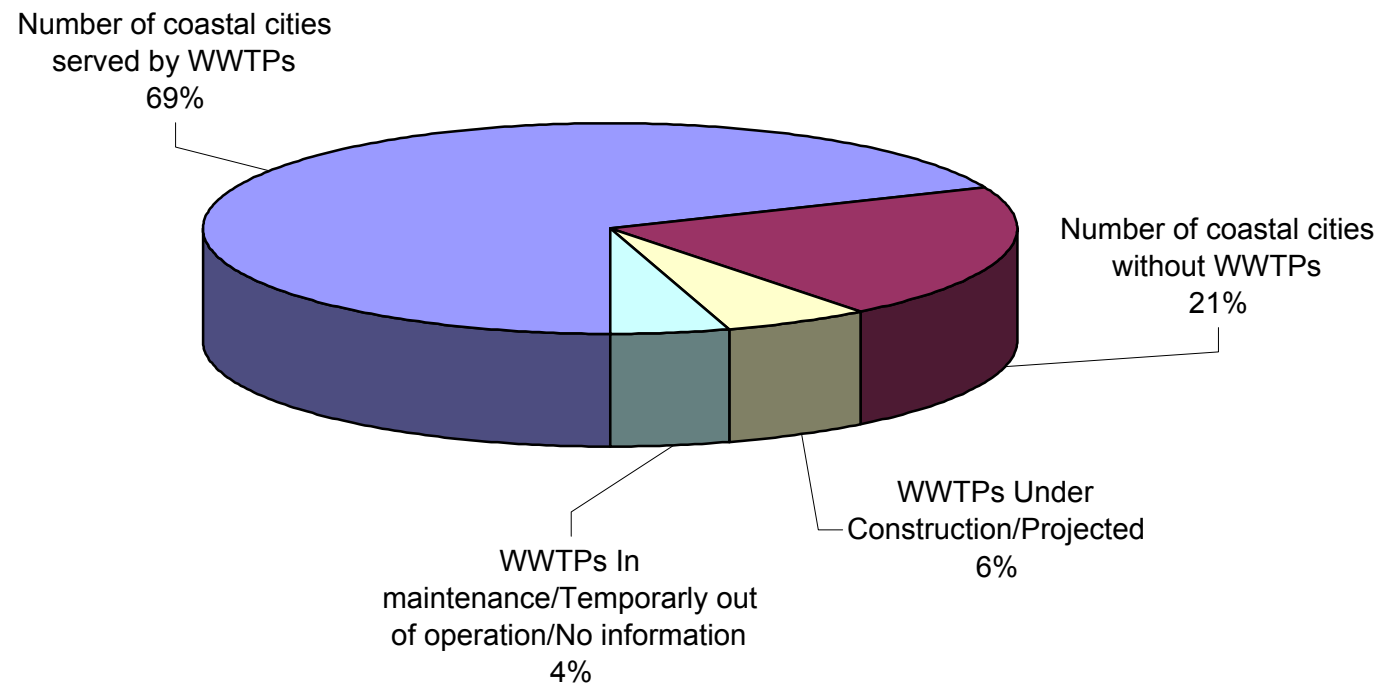
MEDITERRANEAN COASTAL CITIES



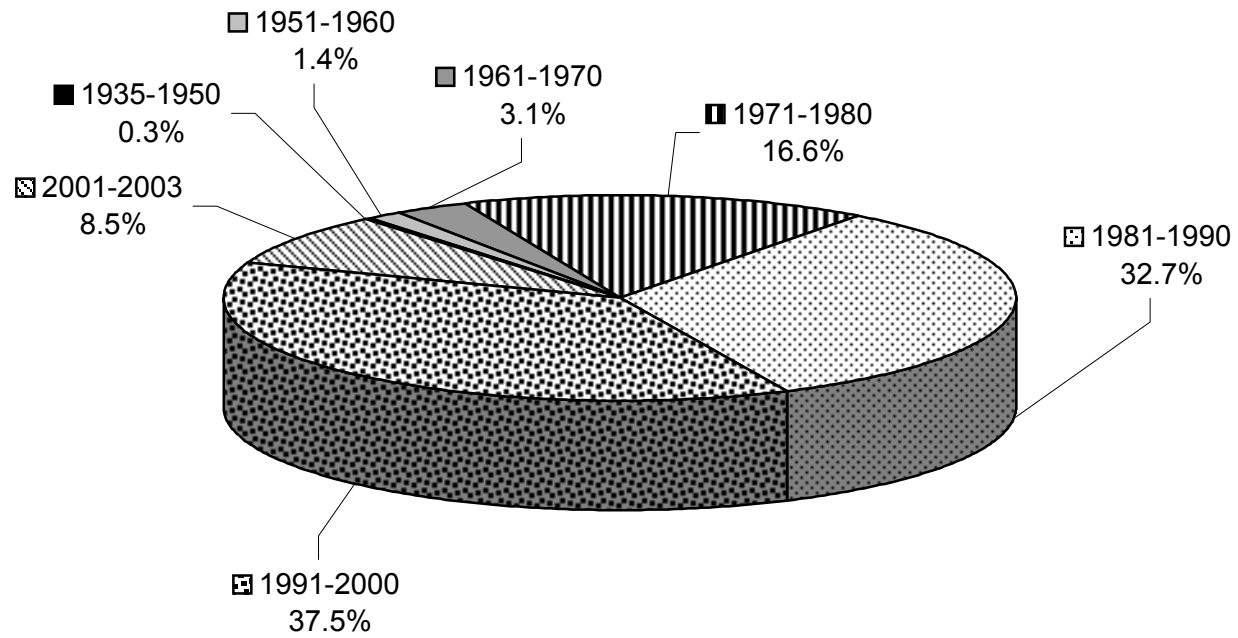
MEDITERRANEAN COASTAL POPULATION



WASTEWATER TREATMENT PLANTS (WWTPs) IN COASTAL CITIES

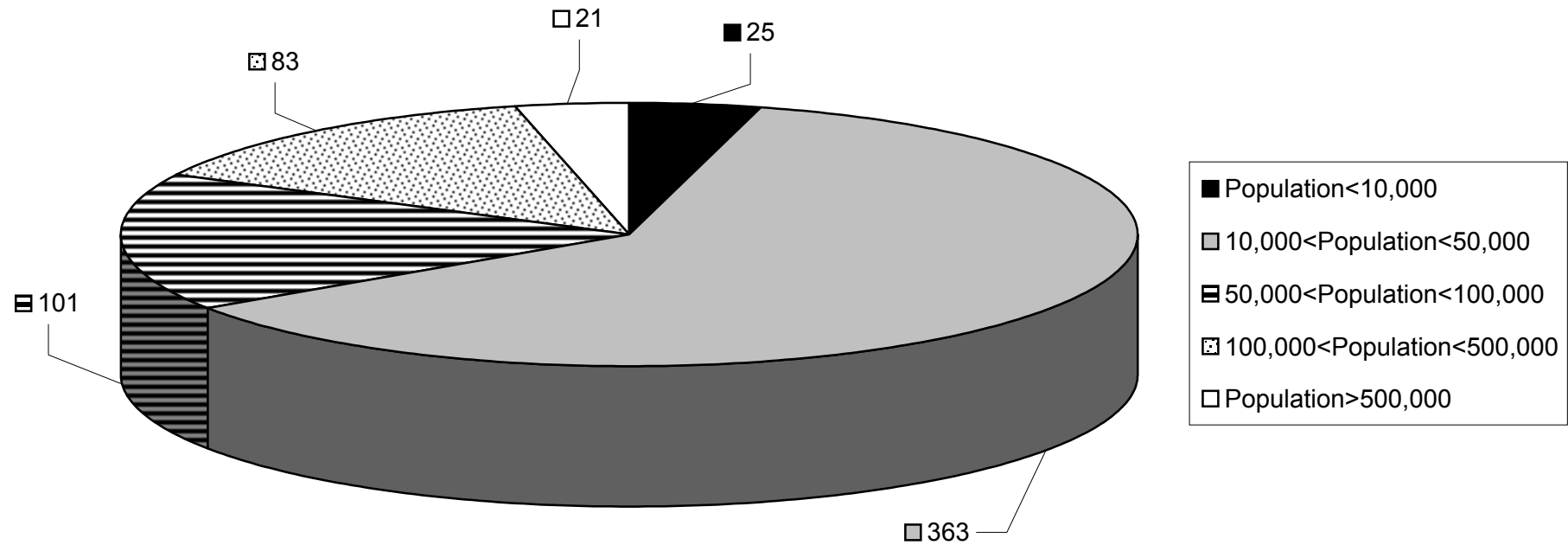


YEAR OF CONSTRUCTION OF WASTEWATER TREATMENT PLANTS (WWTPs)



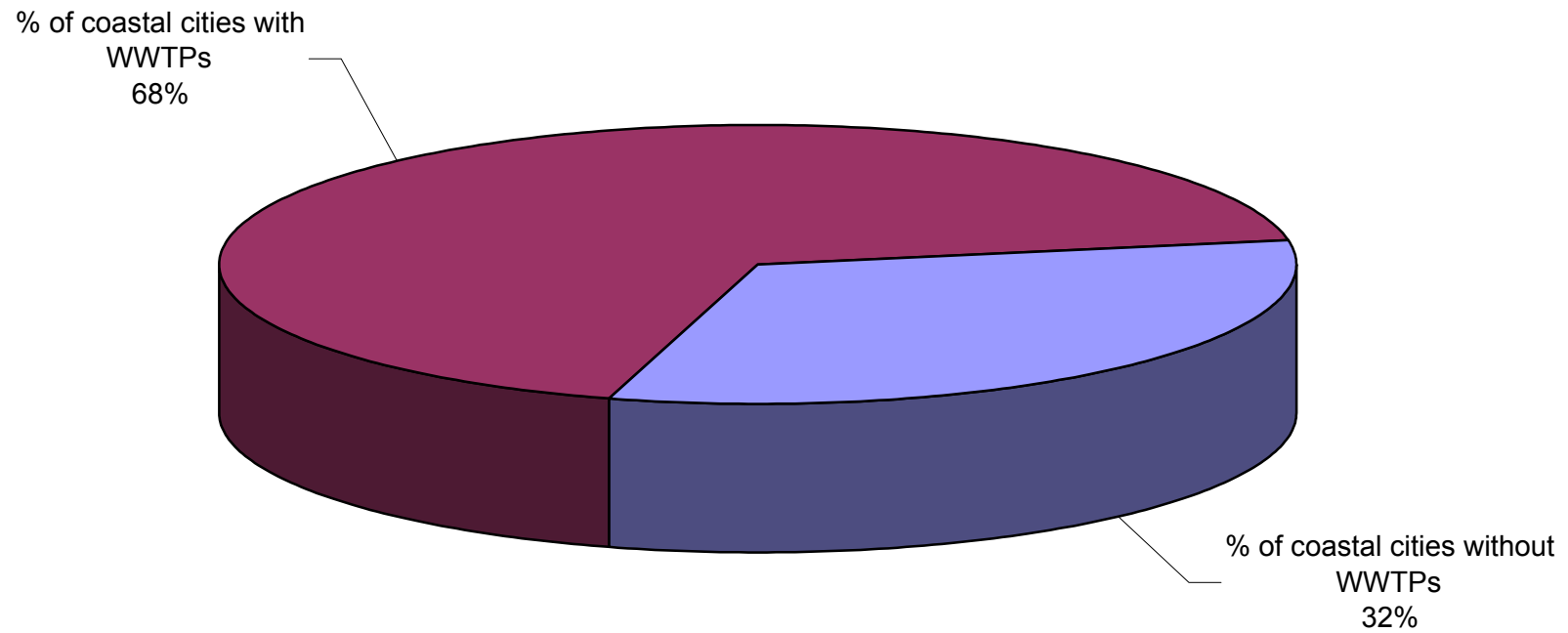
It refers to 355 WWTPs

NUMBER OF COASTAL CITIES AND RELATED POPULATION

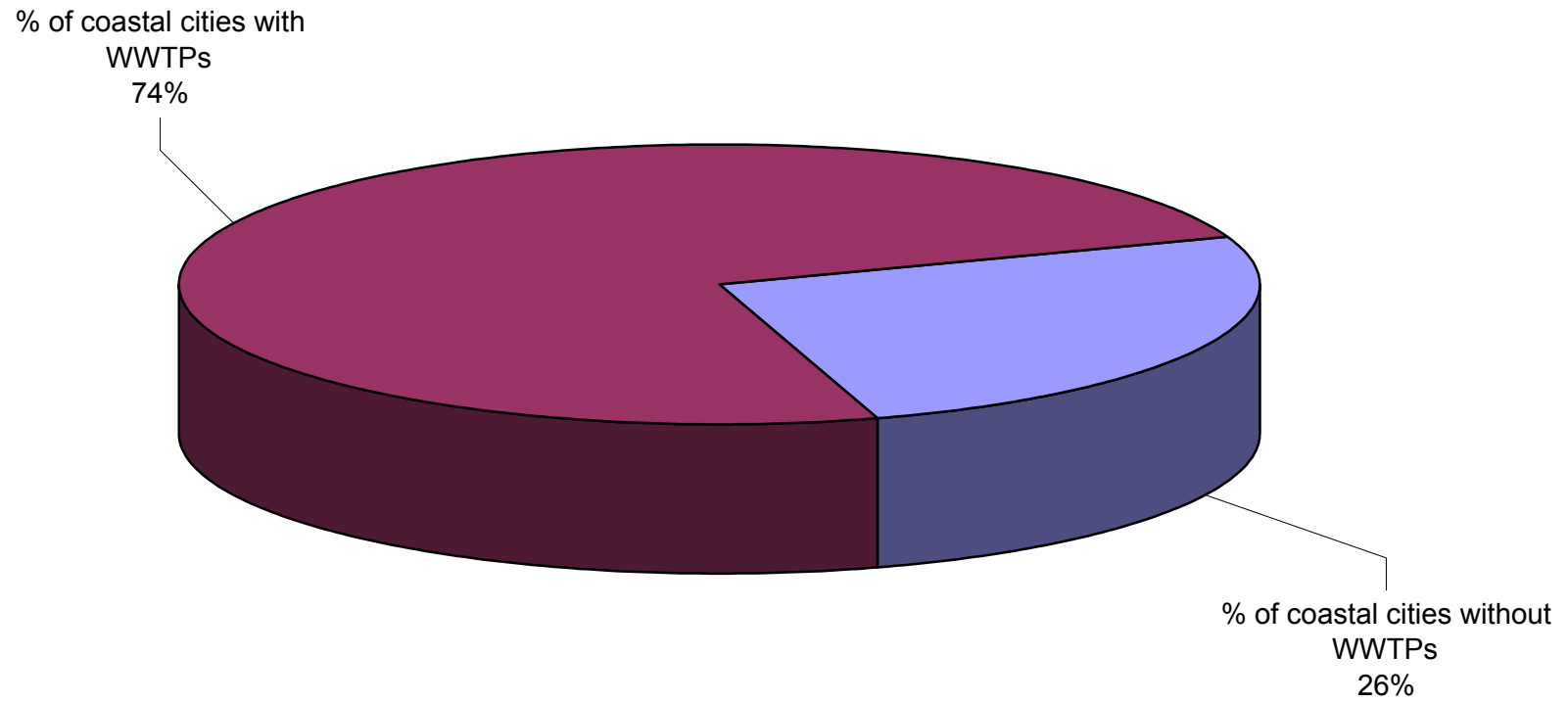


For 593 coastal cities where information exists

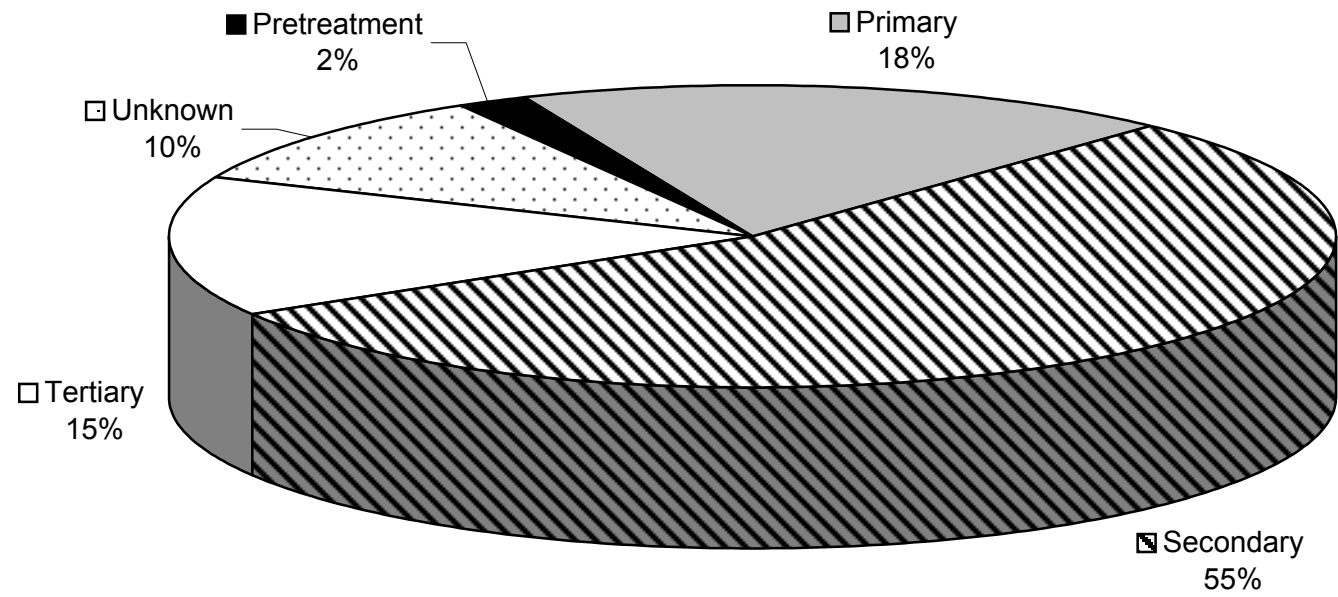
**AVAILABILITY OF WASTEWATER TREATMENT PLANTS (WWTPs) IN COASTAL CITIES WITH
10,000<POPULATION<100,000**



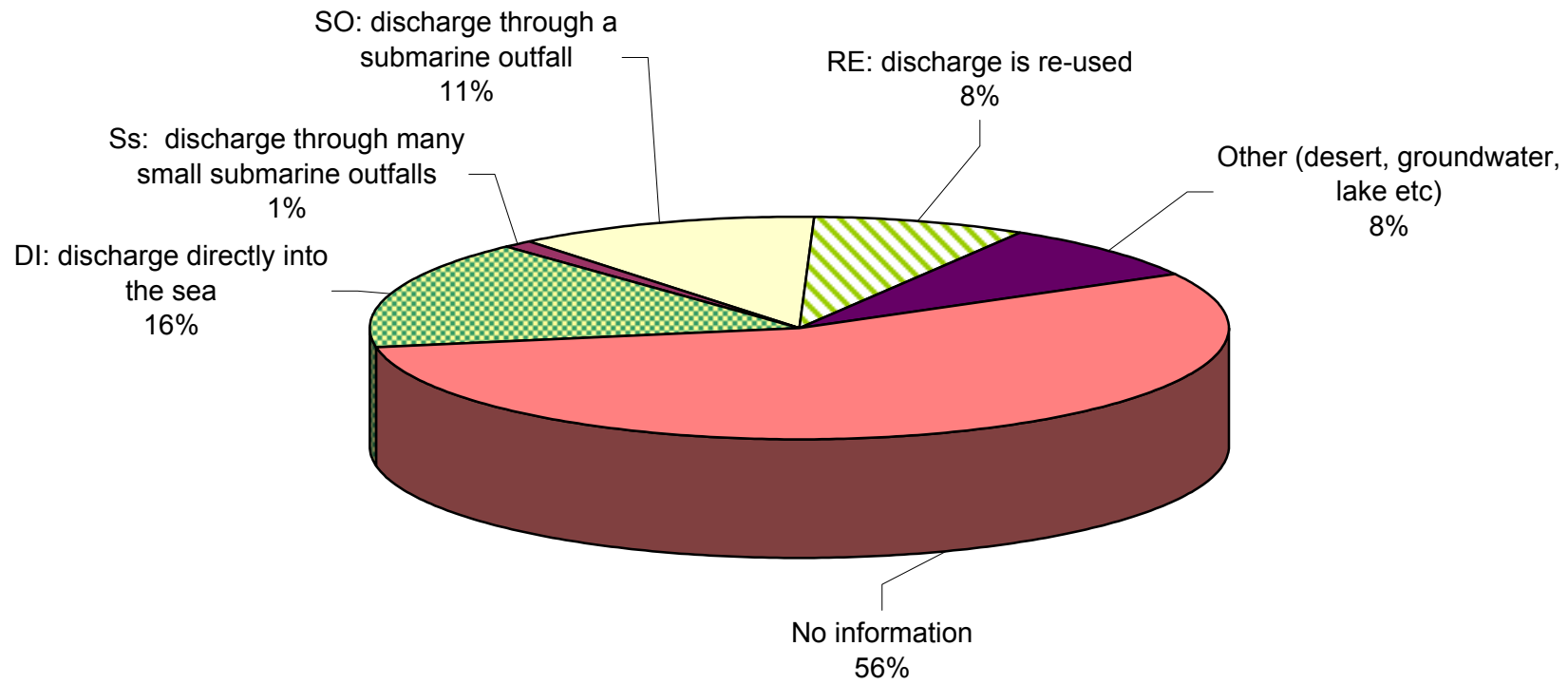
AVAILABILITY OF WASTEWATER TREATMENT PLANTS (WWTPs) IN COASTAL CITIES WITH POPULATION >100,000



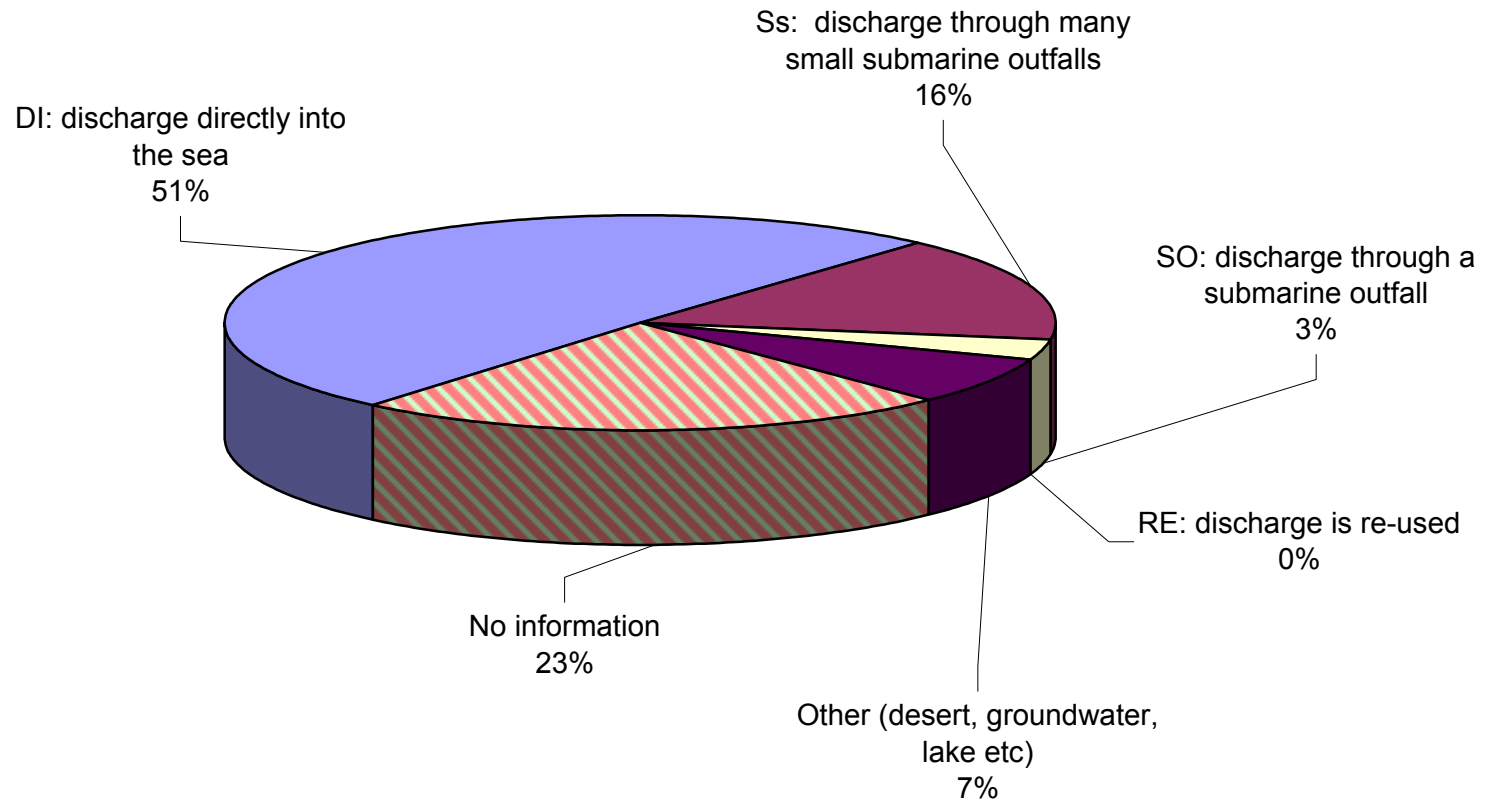
DEGREE OF TREATMENT



DISCHARGE OF TREATED WASTEWATER



DISCHARGE OF UNTREATED WASTEWATER



PART IV

COMPARISON OF THE TWO REPORTING PERIODS

The comparison of the two reporting periods is based on the available information. Part IV presents in graphs the current situation as compared to the situation during the year 2000.

- a) With respect to the number of the Mediterranean coastal cities the differences were in most cases related to the way of reporting, i.e. during the year 2000, cities that were served by a common wastewater treatment plant were not separately reported, while in 2003, were individually mentioned. In some cases the data of the year 2000 were corrected according to more accurate data.
- b) The number of areas served by a wastewater treatment plant increased by 45%, this indicating the progress on wastewater treatment infrastructure.
- c) According to the reported information and with reference to the degree of treatment the situation seems improved since the number of units where tertiary treatment is provided, increased. However, there is a relatively high number of units for which information regarding the degree of treatment does not exist.

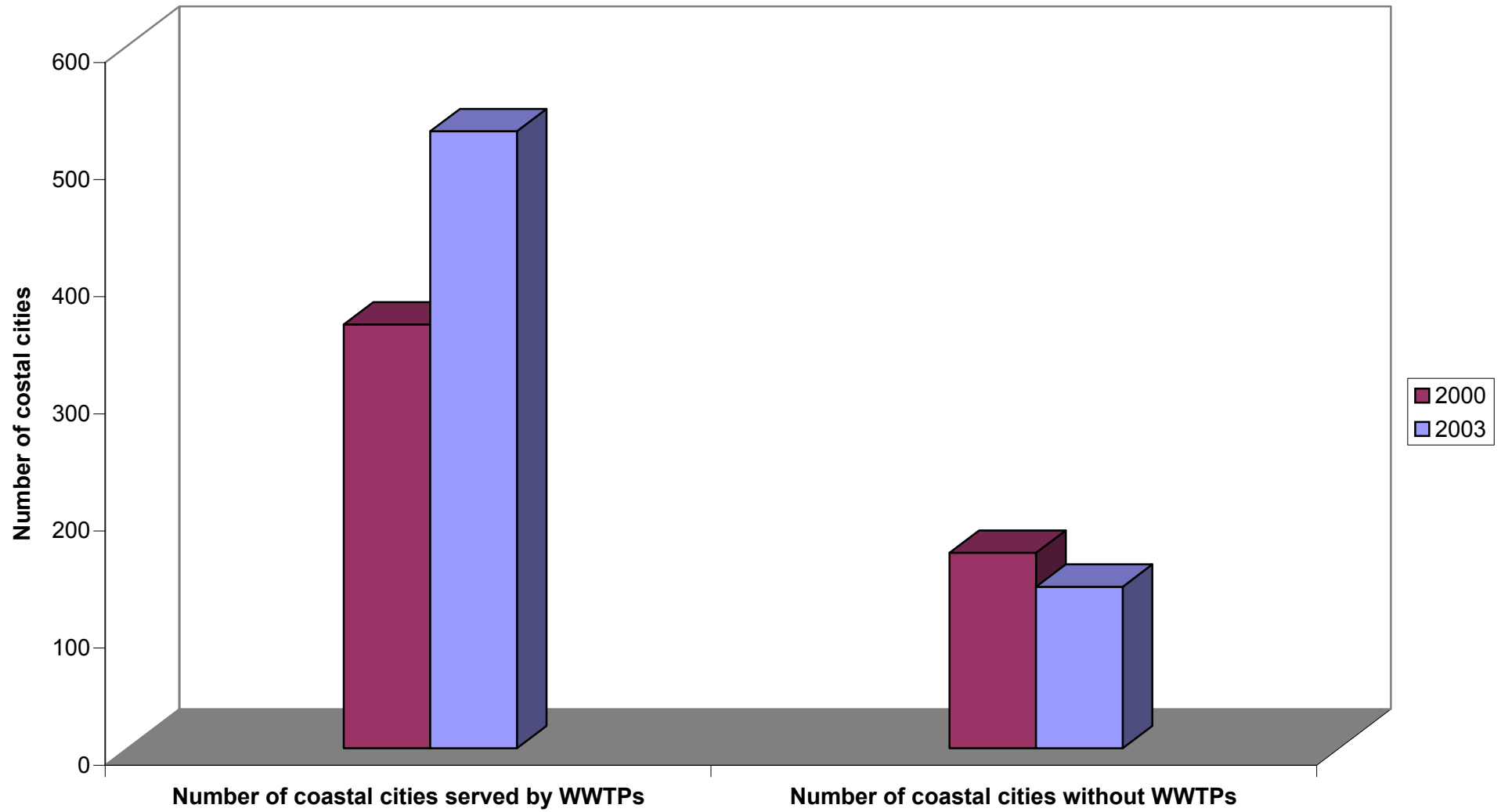
The overall conclusion is that the situation improves along the years, and the effort conducted by all countries should continue in order to achieve the desired result, that in all cases is the protection of the marine environment in the Mediterranean.

The experience gained from the two reporting phases, is valuable in order to design future reporting. The following points should be stressed:

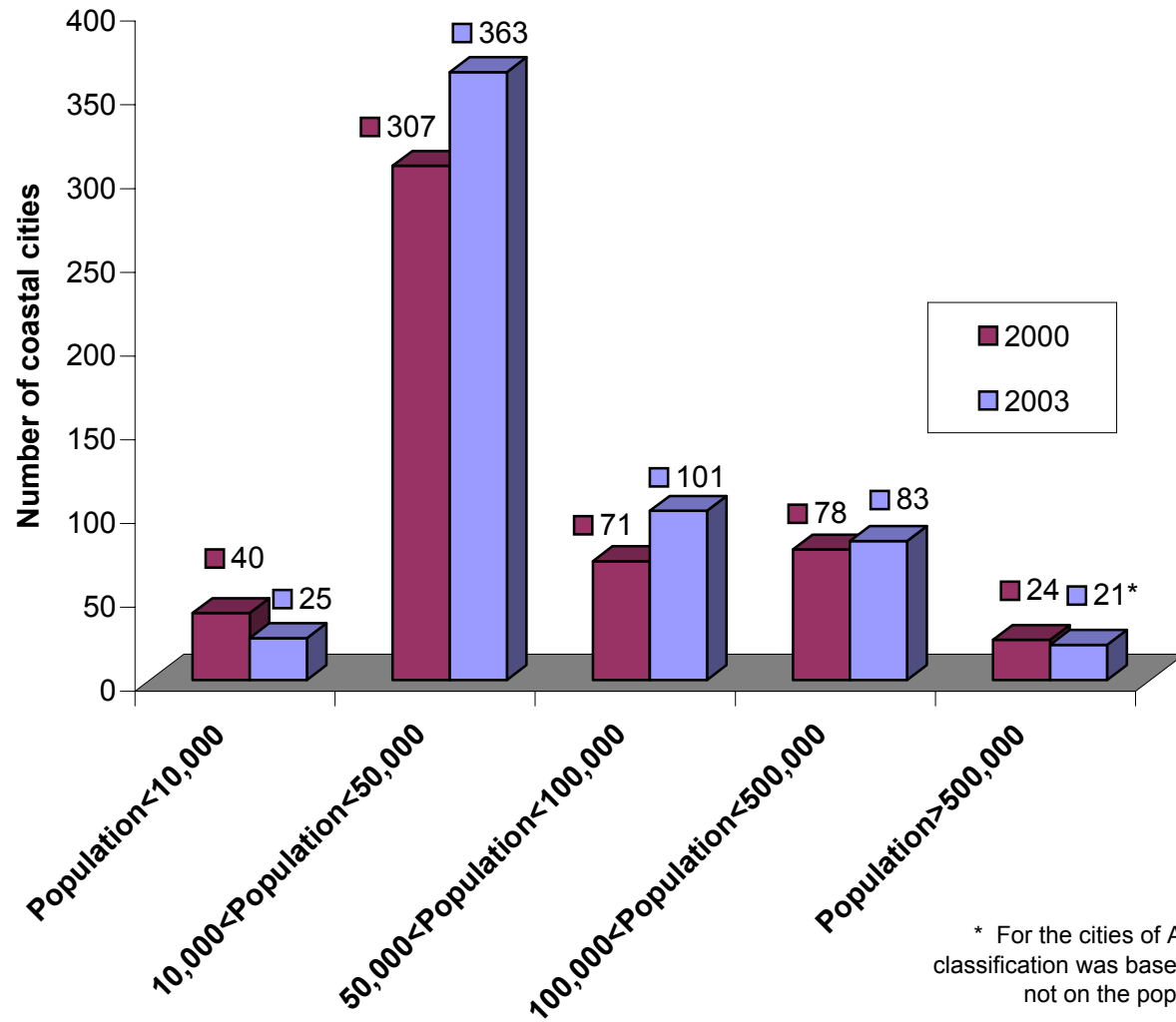
- Efforts should be made in order to complete the information regarding population (permanent and seasonal) or technical data (quantities of wastewater treated or untreated, ways of discharge etc). In cases where there is lack of data, each country may refer to the constraints of this inadequacy of data and possible proposal to overcome the difficulties.
- In cases where there are no facilities (sewerage networks or wastewater treatment plants), information on possible projection of respective works could be included. This additional information will enable the estimation of further improvement of the situation regarding wastewater facilities in the Mediterranean coastal cities.

**GRAPHS COMPARING THE TWO REPORTING PERIODS (2000 & 2003)
WITH RESPECT TO WASTEWATER TREATMENT PLANTS
IN THE MEDITERRANEAN**

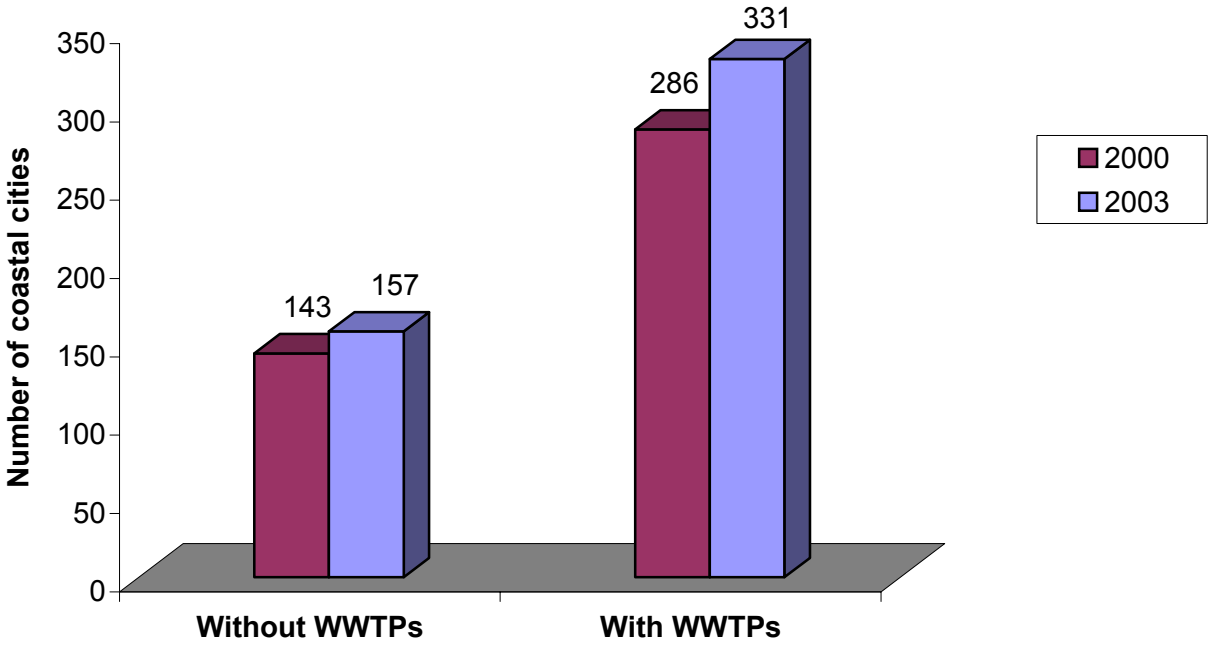
COASTAL CITIES WITH WASTEWATER TREATMENT PLANTS (WWTPs)



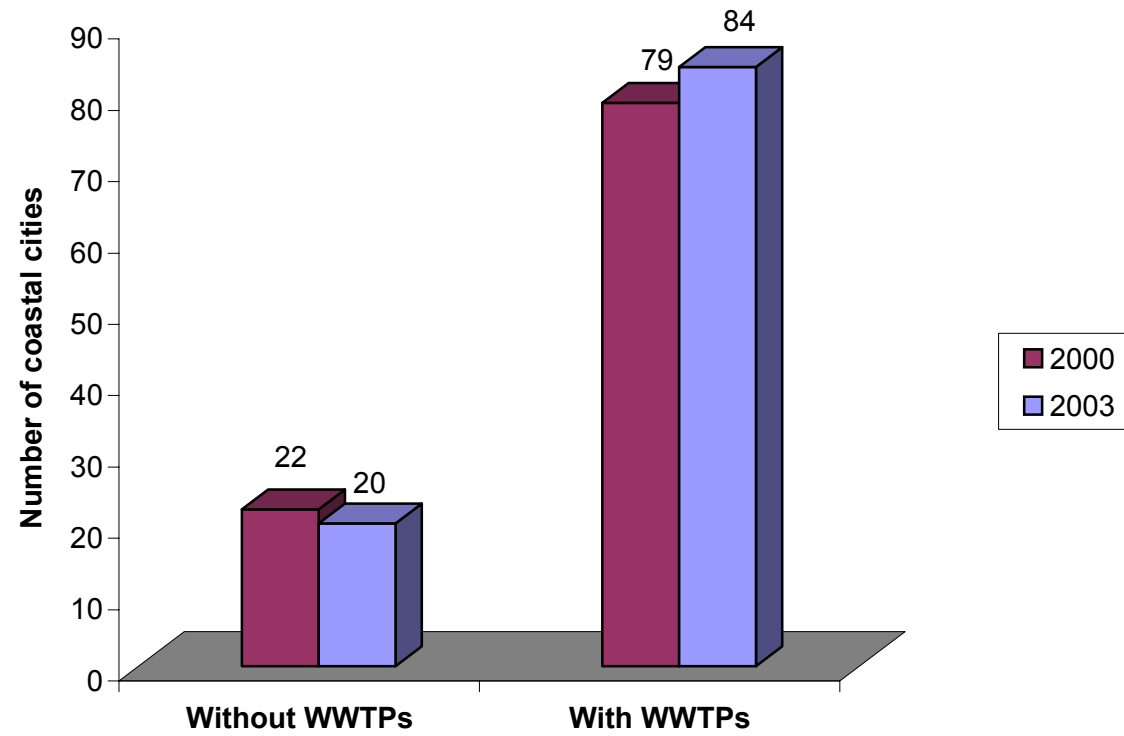
NUMBER OF COASTAL CITIES AND CLASSIFICATION



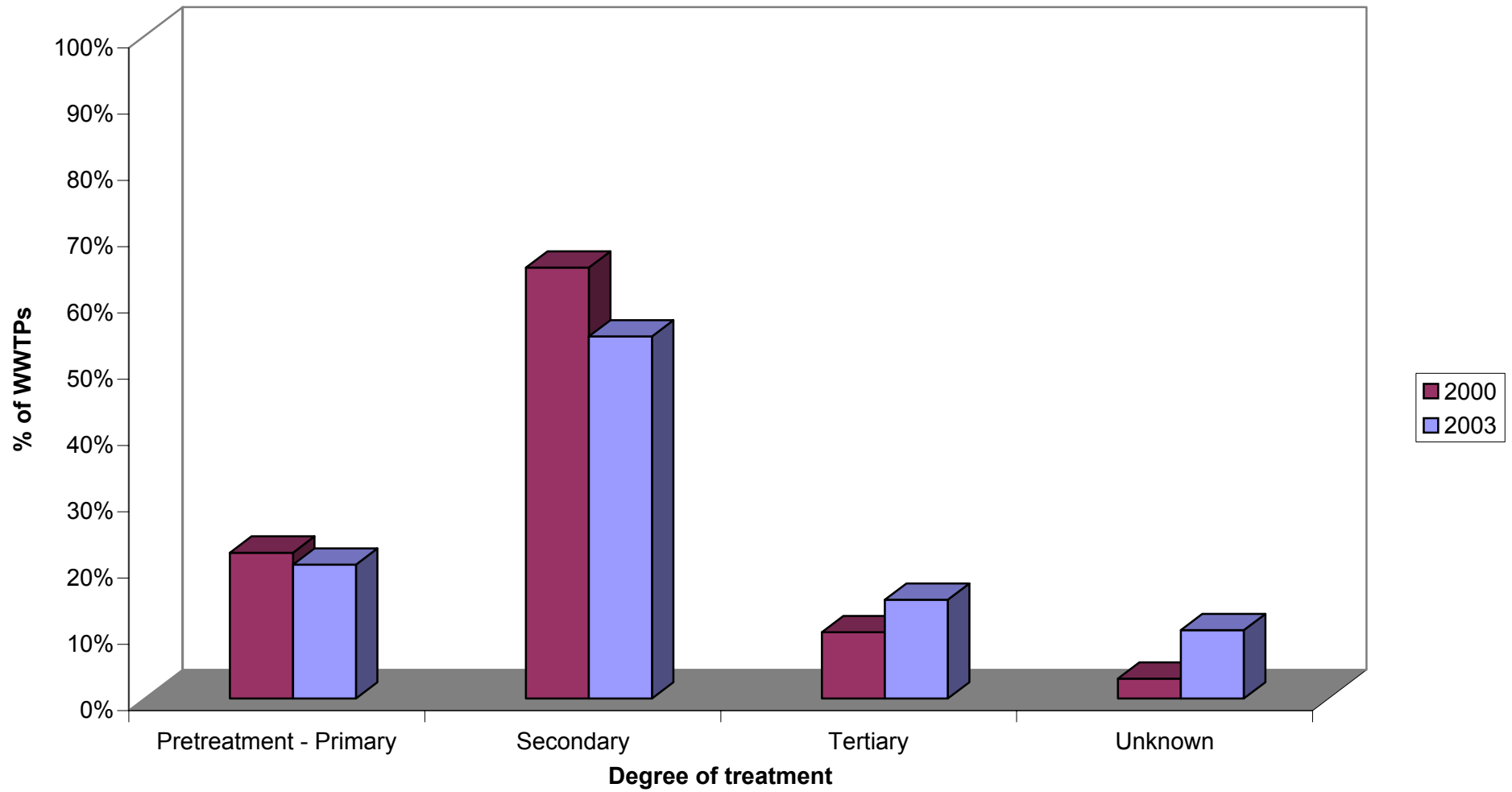
**AVAILABILITY OF WASTEWATER TREATMENT PLANTS (WWTPs) IN COASTAL CITIES WITH
10,000<POPULATION<100,000**



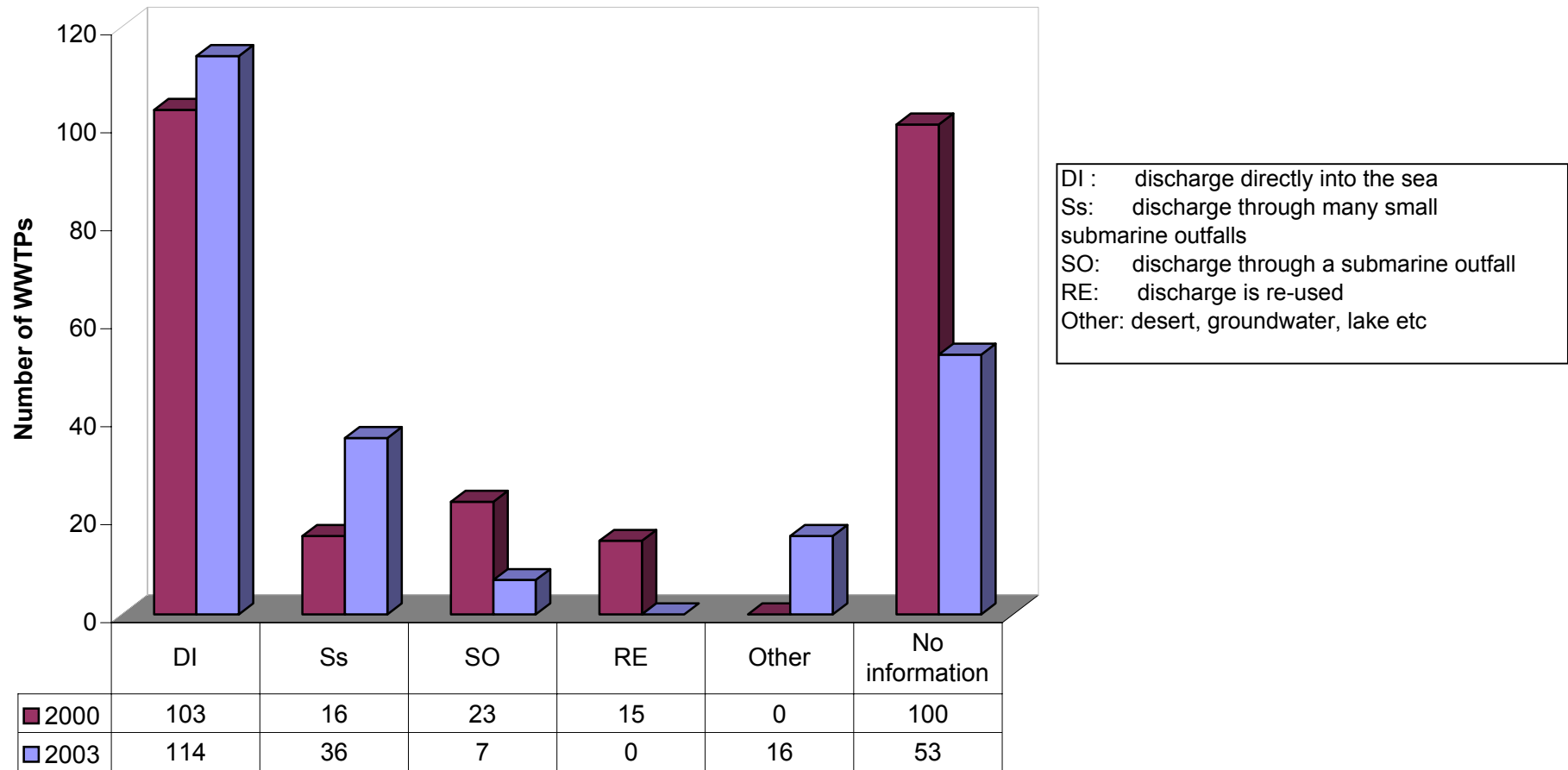
AVAILABILITY OF WASTEWATER TREATMENT PLANTS IN COASTAL CITIES WITH POPULATION>100,000



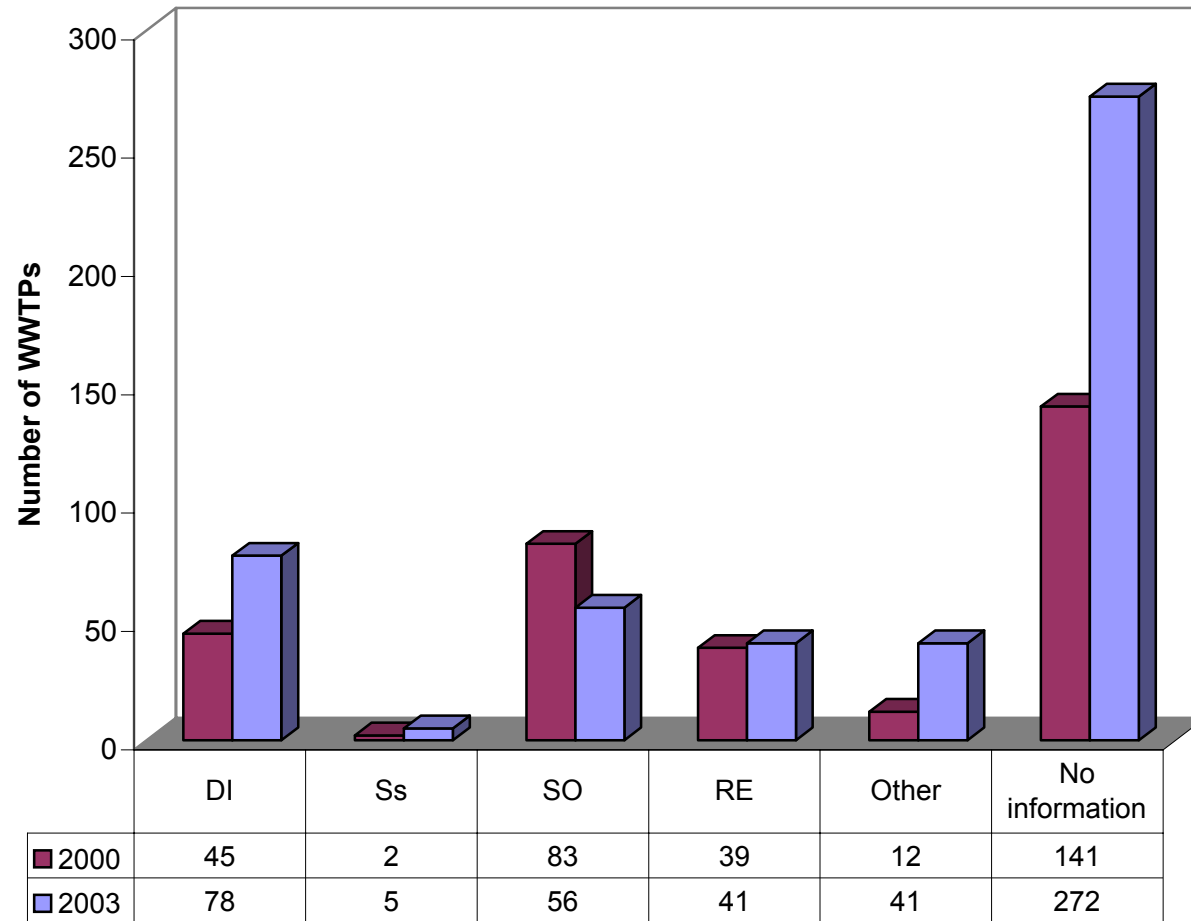
**DEGREE OF TREATMENT PROVIDED BY THE WASTEWATER TREATMENT PLANTS (WWTPs)
SERVING THE COASTAL CITIES**



DISCHARGE OF UNTREATED WASTEWATER



DISCHARGE OF TREATED WASTEWATER



DI : discharge directly into the sea
 Ss: discharge through many small submarine outfalls
 SO: discharge through a submarine outfall
 RE: discharge is re-used
 Other: desert, groundwater, lake etc

LIST OF MAP TECHNICAL SERIES REPORTS (MTS)

MTS Reports are available from our web site at www.unepmap.org in the Documents section.

**MTS 156. UNEP/MAP/MED POL: Inventories of PCBs and nine pesticides. UNEP/MAP: Athens, 2004. (English, French)
Inventaire des PCB et de neuf pesticides.**

**MTS 155. UNEP/MAP/MED POL: Plan for the management PCBs waste and nine pesticides for the Mediterranean Region. UNEP/MAP: Athens, 2004. (English, French).
Plan de gestion des déchets dangereux, y compris un inventaire des déchets dangereux dans la région méditerranéenne.**

**MTS 154. UNEP/MAP/MED POL: Guidelines for the development of ecological status and stress reduction indicators for the Mediterranean Region. UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices pour l'élaboration d'indicateurs d'état écologique et de réduction du stress.**

**MTS 153. UNEP/MAP/MED POL/WHO: Guidelines for the management of industrial wastewater for the Mediterranean Region. UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices pour la gestion des eaux usées industrielles dans la région méditerranéenne.**

**MTS 152. UNEP/MAP/MED POL/WHO: Guidelines on sewage treatment and disposals for the Mediterranean Region. UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices sur le traitement et l'élimination des eaux usées dans la région méditerranéenne.**

**MTS 151. UNEP/MAP/MED POL: Guidelines for river (including estuaries) pollution monitoring programme for the Mediterranean Region. UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices pour un programme de surveillance continue de la pollution fluviale (estuarienne y comprise) dans la région méditerranéenne.**

**MTS 150. UNEP/MAP/MED POL/WHO: Reference handbook on environmental compliance and enforcement in the Mediterranean region. UNEP/MAP: Athens, 2004. (English, French).
Manuel de référence sur le respect et l'application effective des dispositions environnementales dans la région méditerranéenne.**

**MTS 149. UNEP/MAP/MED POL/WHO: Guidelines on environmental inspection systems for the Mediterranean region. UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices sur les systèmes d'inspection environnementale pour la région méditerranéenne.**

**MTS 148. UNEP/MAP/MED POL/WHO: Guidelines on management of coastal litter for the Mediterranean region. UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices sur la gestion des débris côtiers pour la région méditerranéenne.**

**MTS 147. UNEP/MAP/MED POL: Plan for the management of hazardous waste, including inventory of hazardous waste in the Mediterranean region. UNEP/MAP: Athens, 2004. (English, French).
Plan de gestion des déchets dangereux, y compris un inventaire des déchets dangereux dans la région méditerranéenne.**

**MTS 146. UNEP/MAP/RAC/CP: Guidelines for the application of Best Available Techniques (BATs), Best Environmental Practices (BEPs) and Cleaner Technologies (CTs) in industries of the Mediterranean countries. UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices sur l'application des meilleures techniques disponibles (MTD), des meilleures pratiques environnementales (MPE) et des technologies plus propres dans les industries des pays méditerranéens.**

**MTS 145. UNEP/MAP/RAC/CP: Plan for the reduction by 20% by 2010 of the generation of hazardous wastes from industrial installations for the Mediterranean region. UNEP/MAP: Athens, 2004. (English, French).
Plan de réduction de 20%, d'ici à 2010, de la génération de déchets dangereux provenant des installations industrielles dans la région méditerranéenne.**

**MTS 144. UNEP/MAP/MED POL: Plan on reduction of input of BOD by 50% by 2010 from industrial sources for the Mediterranean region. UNEP/MAP: Athens, 2004. (English, French, Arabic).
Plan de réduction de 50%, d'ici à 2010, des apports de DBO d'origine industrielle dans la région méditerranéenne.**

**MTS 143. UNEP/MAP/RAC/CP: Guidelines for the application of Best Environmental Practices (BEPs) for the rational use of fertilisers and the reduction of nutrient loss from agriculture for the Mediterranean region. UNEP/MAP: Athens, 2004. (English, French, Arabic).
Lignes directrices sur l'application des meilleures pratiques environnementales (MPE) pour l'utilisation des engrais et la réduction des pertes d'éléments nutritifs dans l'agriculture en région méditerranéenne.**

- MTS 142.** UNEP/MAP/RAC/CP: **Guidelines for the application of Best Available Techniques (BATs) and Best Available Practices (BEPs) in industrial sources of BOD, nutrients and suspended solids for the Mediterranean region.** UNEP/MAP: Athens, 2004. (English, French).
Lignes directrices sur l'application des meilleures techniques disponibles (MTD) et des meilleures pratiques environnementales (MPE) aux sources industrielles de DBO, d'éléments nutritifs et de matières en suspension pour la région méditerranéenne.
- MTS 141.** UNEP/MAP/MED POL: **Riverine transport of water, sediments and pollutants to the Mediterranean Sea.** UNEP/MAP: Athens, 2003. (English).
- MTS 140.** UNEP/MAP/MED POL: **Mariculture in the Mediterranean.** UNEP/MAP: Athens, 2004. (English).
- MTS 139.** UNEP/MAP/MED POL: **Sea Water Desalination in the Mediterranean: Assessment and Guidelines.** UNEP/MAP: Athens, 2003. (English, French)
Dessalement de l'eau de mer en méditerranée: évaluation et lignes directrices.
- MTS 138.** UNEP/MAP/PAP: **MAP CAMP Project "Malta": Final Integrated Project Document and Selected Thematic Documents.** UNEP/MAP: Athens, 2002. (English).
- MTS 137.** UNEP/MAP/BLUE PLAN: **Free Trade and the Environment in the Euro-Mediterranean Context, Montpellier/Mèze, France, 5 – 8 October 2000:** Volume I: Technical Report of the Workshop; Volume II: Regional and International Studies; Volume III: National Studies; Volume IV: Environmental Aspects of Association Agreements (4 Vols), UNEP/MAP: Athens, 2002. **Libre-échange et environnement dans le contexte euro-méditerranéen : Montpellier/Mèze, France, 5 – 8 octobre 2000** (Parts in English & French).
- MTS 136.** UNEP/MAP/MED POL: **Guidelines for the management of fish waste or organic materials resulting from the processing of fish and other marine organisms.** UNEP/MAP: Athens, 2002. (English, French, Spanish & Arabic).
- MTS 135.** PNUE/PAM: **PAC DU PAM "Zone côtière de Sfax": Synthèse des études du projet, rapport de la réunion de clôture et autres documents choisis.** PNUE/PAM, Athènes, 2001. (French).
- MTS 134.** UNEP/MAP/PAP: **MAP CAMP Project "Israel": Final Integrated Report and Selected Documents.** UNEP/MAP: Athens, 2001. (English).
- MTS 133.** UNEP/MAP: **Atmospheric Transport and Deposition of Pollutants into the Mediterranean Sea: Final Reports on Research Projects.** UNEP/MAP: Athens, 2001. (English).
- MTS 132.** UNEP/MAP/WHO: **Remedial Actions for Pollution Mitigation and Rehabilitation in Cases of Non-compliance with Established Criteria.** UNEP/MAP: Athens, 2001. (English).
- MTS 131.** UNEP/MAP: **MAP CAMP Project "Fuka-Matrouh", Egypt: Final Integrated Report and Selected Documents.** (2 Vols.), UNEP/MAP: Athens, 2001. (English).
- MTS 130.** UNEP/MAP/WMO: **Atmospheric Input of Persistent Organic Pollutants to the Mediterranean Sea.** UNEP/MAP: Athens, 2001. (English).
- MTS 129.** UNEP/MAP/MED POL: **Guidelines for the Management of Dredged Material.** UNEP/MAP: Athens, 2000. (English, French, Spanish and Arabic).
Lignes Directrices pour la gestion des matériaux de dragage.
Directices para el manejo de los materiales de dragado.
- MTS 128.** UNEP/MAP/MED POL/WHO: **Municipal Wastewater Treatment Plants in Mediterranean Coastal Cities.** UNEP/MAP: Athens, 2000 (English, French).
Les Stations d'épuration des eaux usées municipales dans les villes cotiers de la Méditerranée.
- MTS 127.** UNEP/MAP/BLUE PLAN: **Minutes of the Seminar, Territorial Prospective in the Mediterranean and the Approach by Actors, Sophia Antipolis, France, 7-9 November 1996.** UNEP/MAP: Athens, 2000. (In French with English introduction and 1 paper).
Actes du séminaire, La prospective territoriale en Méditerranée et l'approche par acteurs.
- MTS 126.** UNEP/MAP/MCSD/Blue Plan: **Report of the Workshop on Tourism and Sustainable Development in the Mediterranean, Antalya, Turkey, 17-19 September 1998.** UNEP/MAP: Athens, 1999. (English, French).
Rapport de l'atelier sur le tourisme et le développement durable en Méditerranée, Antalya, Turquie, 17-19 septembre 1998.
- MTS 125.** UNEP/MAP: **Proceedings of the Workshop on Invasive *Caulerpa* Species in the Mediterranean, Heraklion, Crete, Greece, 18-20 March 1998.** UNEP/MAP: Athens, 1999. (English, French). **Actes de l'atelier sur les especes *Caulerpa* invasives en Méditerranée, Heraklion, Crète, Grèce, 18-20 mars 1998.**

MTS 124. UNEP/MAP/WHO: **Identification of Priority Hot Spots and Sensitive Areas in the Mediterranean.** UNEP/MAP: Athens, 1999. (English, French).
Identification des “Points Chauds” et “Zones Sensibles” de pollution prioritaire en Méditerranée.

MTS 123. UNEP/MAP/WMO: **MED POL Manual on Sampling and Analysis of Aerosols and Precipitation for Major Ions and Trace Elements.** UNEP/MAP: Athens, 1998. (English).

MTS 122. UNEP/MAP/WMO: **Atmospheric Input of Mercury to the Mediterranean Sea.** UNEP/MAP: Athens, 1998. English).

MTS 121. PNUE: **MED POL Phase III. Programme d'évaluation et de maîtrise de la pollution dans la région Méditerranéenne (1996-2005).** UNEP/MAP: Athens, 1998. (In publication)

MTS 120. UNEP/MAP: **MED POL Phase III. Programme for the Assessment and Control of Pollution in the Mediterranean Region (1996-2005).** UNEP/MAP: Athens, 1998.

MTS 119. UNEP/MAP: **Strategic Action Programme to Address Pollution from Land-Based Activities.** UNEP/MAP: Athens, 1998. (English, French)
Programme d'Actions Stratégiques visant à combattre la pollution due à des activités menées à terre.

MTS 118. UNEP/MAP/WMO: **The Input of Anthropogenic Airborne Nitrogen to the Mediterranean Sea through its Watershed.** UNEP/MAP: Athens, 1997 (English).

MTS 117. UNEP/MAP: **La Convention de Barcelone pour la protection de la mer Méditerranée contre la pollution et le développement durable.** UNEP/MAP: Athens, 1997 (Français seulement).

MTS 116. UNEP/MAP/IAEA: **Data Quality Review for MED POL (1994-1995), Evaluation of the analytical performance of MED POL laboratories during 1994-1995 in IAEA/UNEP laboratory performance studies for the determination of trace elements and trace organic contaminants in marine biological and sediment samples.** UNEP/MAP: Athens, 1997 (English).

MTS 115. UNEP/MAP/BP **Methodes et outils pour les études systémiques et prospectives en Méditerranée, PB/RAC, Sophia Antipolis, 1996.** UNEP/MAP/BP: Athens, 1996 (français seulement).

MTS 114. UNEP/MAP: **Workshop on policies for sustainable development of Mediterranean coastal areas, Santorini Island, 26-27 April 1996. Presentation by a group of experts.** UNEP/MAP: Athens, 1996 (Parts in English or French only).
 PNUE: **Journées d'étude sur les politiques de développement durable des zones côtières méditerranéennes, Ile de Santorin, 26-27 avril 1996. Communications par un groupe d'experts.** (Parties en anglais ou français seulement).

MTS 113. UNEP/MAP/IOC: **Final reports of research projects on transport and dispersion (Research Area II) - Modelling of eutrophication and algal blooms in the Thermaikos Gulf (Greece) and along the Emilia Romagna Coast (Italy).** UNEP/MAP: Athens, 1996 (English).

MTS 112. UNEP/MAP/WHO: **Guidelines for submarine outfall structures for Mediterranean small and medium-sized coastal communities.** UNEP/MAP: Athens, 1996 (English, French).
Lignes directrices pour les émissaires de collectivités côtières de petite et moyenne taille en Méditerranée.

MTS 111. UNEP/MAP/WHO: **Guidelines for treatment of effluents prior to discharge into the Mediterranean Sea.** UNEP/MAP: Athens, 1996 (English).

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