



See the Sea

**The Slovenian Mediterranean
and Sustainable Development**

*There are two types
of Slovenian coast:
the abyssal abrasion type (on the
cover) and the flat accumulation
type – the Dragonja
River estuary.*



*“Sustainable development is development that satisfies our needs today
without threatening the ability of future generations to satisfy their own
needs.”*

World Commission on the Environment and Development (WCED) in the report Our
Common Future, 1987

Preface

This publication intends to be a mirror reflecting the rather complex yet interesting mosaic of relations between the environment and sustainable development in Slovenia and each of its components.

It is addressed to all actors in all areas and at all levels: since we are all part of the problem, we should also be part of the solution as well.

It is also a further step towards the implementation of the various activities geared at promoting wide public awareness on the environment and development issues at national and local levels.

More specifically, it represents one of the key activities in this regard which have been approved by the 20 Mediterranean countries that, together with the EU, constitute the Contracting Parties to the Barcelona Convention. This is a Convention launched over quarter of a century ago, under the auspices of UNEP, through the Mediterranean Action Plan, as a concrete, efficient means to protect the Mediterranean from all sorts of pollution and degradation, and promote sustainable development in the region.

Being among the major activities boosted by the Mediterranean Commission on Sustainable Development in the field of information and public awareness, this brochure focuses on: the environment and Sustainable Development, trends, stakes and constraints, the status of the environment, and the structure and activities of the Ministry of Environment. A chapter is devoted to the relations with the Mediterranean Action Plan as well as the activities with the Mediterranean Commission on Sustainable Development.

No wonder then that it comes out as a joint initiative, created by UNEP/MAP and supported by it, aimed at supporting the continuous efforts undertaken by the Ministry towards the full integration of the environment into sustainable development issues.

Pricelessly Small

Natural Conditions

The Geographical Position of Slovenia in the Mediterranean

The most Northern part of the Mediterranean, where it indents Europe the most deeply, is found at the Gulf of Trieste - the Adriatic Ports of Trieste and Koper are 130 km more to the north than the Port of Genova in the Ligurian Sea, which accounts for their importance to transport.

The surface of the entire Gulf of Trieste is small and amounts to only 550 square km. Compared with the rest of the Adriatic Sea it is an extremely shallow bay (average depth here is 16 m). In the Gulf of Trieste three dominating European landscapes or eco-regions come together: the Mediterranean, the Dinaric system and the Alps, each of them decisively influencing the features of the Gulf.

Only a small percentage of the surface of Slovenia belongs to the Mediterranean basin. Yet the undersea, marine and costal area of Slovenian Istria is an exceptionally important natural landscape. This economically healthy region has an opportunity to integrate actively a relatively conserved and biologically extremely diversified ecosystem into developmental planning.



The position of Slovenia in the Mediterranean: where the Mediterranean, the Alpine and the Dinaric landscapes meet in the Gulf of Trieste.

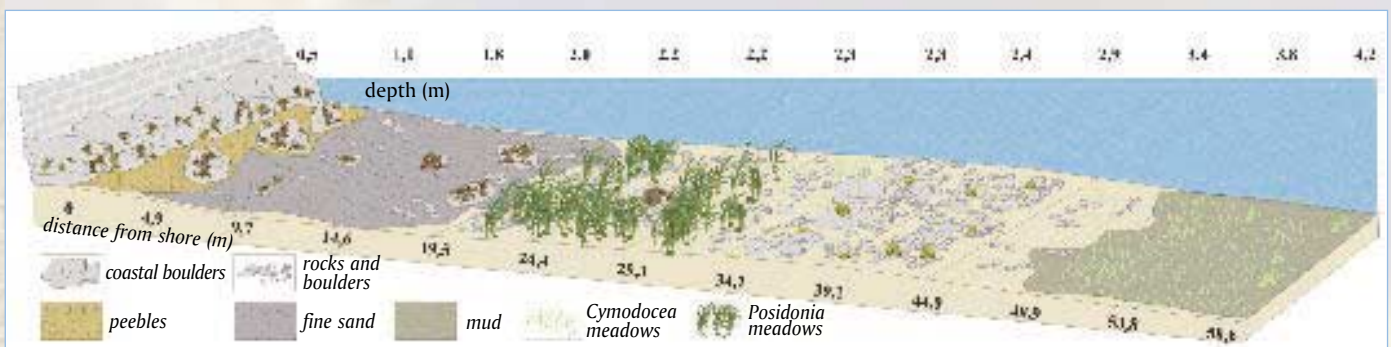


The northern part of the Gulf of Trieste is marked by the delta of a distinctively **Alpine River - the Soča/Isonzo** - which has large fan-like embankments that create the lagoons of Grado. Owing to the large quantities of sand deposited by the Soča/Isonzo River, this is a distinctively accumulative type of coast, where the accumulation of fine sand sediments creates a shallow sea with a shelving bottom. This accumulative type of coast continues as far as Montfalcone, where the sea meets the Karst* (see page 6), a typically Dinaric landscape. This is exemplified by the Karstic Timava River, which rises here in the immediate hinterland of the sea after 40 km of underground streams, then sinks again as the Reka River which flows through the Škocjan Caves system in Slovenia. The contact between the hard limestone and a relatively deep sea - the Dalmatian/Karstic type of coast - then stretches to Trieste and the Flysch Milje Peninsula where the Slovenian coast begins.

The appearance of the whole Slovenian coast and the Istrian Peninsula is dominated by the alternation of marl and sandstone. Yellow-grey layers of more resistant sandstone alternate with grey and softer marl; the basis of both is called flysch and forms a fertile soil for Mediterranean crops: vineyards (refosk, malvasia), olive trees, fruit trees and early vegetables. The flysch landscape stretches all the way inland to the edge of the Karst, and to the estuary of the Dragonja River at the limestone ridge of the Strunjan Peninsula.



The use of sandstone on the new bathing area (an attempt to adapt a new development to the environment) and the Piran pier is made of sandstone from the hinterland.



Habitat types along the transect in Koper bay (near the town of Žusterna)

Superimposed on this dominant feature we find two distinctively different types of geomorphology on the Slovenian coast:

-the *abrasive type* (with characteristic abyssal cliffs and distinctively deeper undersea-ditches caused by streaming past exposed capes)

-*accumulative type* (distinctively flat in the mouths of valleys and rivers, the Rižana and Badaševica Rivers, the brook of Strunjan and the Dragonja River - sediment deposits result in a gently shelving sea bottom)

Three countries share the marine ecosystem of the Gulf of Trieste with the appurtenant river basin: Italy, Slovenia and Croatia. The Slovenian coast encompasses one third of the Gulf of Trieste in its southeastern part or almost 47 km, which is only one thousandth of the entire Mediterranean coast.



Osp village at the wall of the Karstic landslide where flysch comes in contact with water. The wall offers great thermal conditions and protects people and Mediterranean vegetation from the cold north wind.

CONTACT OF FOUR
DIFFERENT LANDSCAPES:

1 – a distinctively uniform plain
created by intensive
sedimentation of the Soča River

2 – limestone and classical
Karst, steeply rising from the
Soča plain

3 – alternation of layers of marl
and sandstone, the moulder of
both is called the flysch; this is a
dynamic landscape that slowly
descends from the Karstic base
toward the sea where its ridges
break dramatically into the sea
as steep cliffs

4 – the marine Mediterranean
landscape that together with its
shallow undersea has its most
northerly indents into Europe in
the Gulf of Trieste



*Karst - limestone landscape which was scientifically described for the first time together with its specific geographical phenomena in Slovenia; it is for this reason that in scientific literature the Slovene term Karst (Ger. Karst, Ital. Carso ...) has been accepted and used as a term denominating the limestone landscape type all over the world. The Institute for Karst Research in Postojna (a Scientific Research Centre of the Slovenian Academy of Sciences and Arts) continues the scientific tradition of Karst research and is among the leading such institutions in the world.

Principal Geographical Determinants of the Slovenian Part of the Gulf of Trieste:

Composition and form of the surface (geomorphology)

Karst: limestone surface without water streams with an underground world of caves and Karstic hydrology. **Boundary: Karst/flysch;** a water well belt; at the wells and under the Karstic edge protection from the cold north wind makes the area suitable for settlements on terraced slopes. **Flysch:** component of marl and sandstone, a dominant feature of Slovenian Istria that stretches to the sea and ends with either steep (vertical) cliffs - the abrasive type of coast - or flat and comprising river deposits - the accumulative type of coast. This is a distinctive landscape feature of the entire Adriatic coast, from the perspective of its function as well as its appearance and thus an important element of the identity of Slovenian Istria (sandstone is used as the construction material for buildings, squares, piers, terraces ...).

Climate

Moderate climate with rapid intrusions of cold north Bura wind (thus: subMediterranean climate). Winters: possibility of frost in the open - the autochthonous vegetation on northern slopes has adapted to that.

Hydrology

Karstic underground waters with low self-purification capacity/high vulnerability. Surface water network is distinctively torrential; when rains occur, a large quantity of water is released into the shallow Gulf of Trieste (average depth 16 m, volume 9 km³) that together with the north wind causes particularly large fluctuations in marine temperature and salinity.

Plant and animal diversity

Exceptional - due to the contact of three European eco-regions and their intermingling, distinctive fluctuations in water and land eco-systems (subMediterranean features).

Drops of Gold

Economic Activity



A high density of settlements, intense industrial production and transport infrastructure, including the transformation of the coast, which is substantially greater on the Italian side in the Trieste and Montfalcone hinterland than it is in the Slovenian part of the Gulf. As well as the environmental pressures and emissions relating to the use of the coast in the Gulf, the Po River should be mentioned. This is a dominant external (regional) factor that crucially influences the status of the North Adriatic ecosystem (quantitatively and qualitatively), and therefore the Gulf of Trieste through sea streaming under specific meteorological and hydrological conditions.

Valvasor - Socerb and the Gulf of Trieste.

The Italian side of the Gulf of Trieste at Milje has been substantially transformed by the petrochemical industry with its many storage tanks. When compared to the Italian side the Slovenian part of the Gulf has been more conserved, which is an important advantage for a thoughtful and quality development that considers the environment.



A view from the Karstic edge onto the Gulf of Trieste clearly shows all the pressures imposed on the coast.



Satellite picture of the Gulf of Trieste and hinterland (Landsat 5 TM / Fucino; 2000; Eurimage; EIP, obdelava B.Petelin, MBP, NIB).

The river network in Slovenian Istria.



Terraced olive groves; the salt-pan house in Sečovlje; the water condensing pool at the saltpans.



The Po River basin encompasses an area almost four times larger than Slovenia. From the perspectives of agriculture, food, industry and transport it is economically the strongest and the most densely populated Italian region. The river on average brings into the Adriatic 1460 m³/s of water, which is heavily burdened with waste generated by man's activities. The Soča/Isonzo River influent, the largest river in the Gulf of Trieste, is almost 15 times smaller but has a significant impact on the Gulf of Trieste, especially after intense rains in the hinterland when it carries a large quantity of floating material (tree trunks), which can endanger smaller boats both at the estuary and along the coast. The basin of the Slovenian Rivers of Rižana, Badaševica and Dragonja is almost equal to the surface of the Gulf of Trieste yet the average influent of all the three rivers amounts to less than one tenth of the flow of the Soča/Isonzo.

Until the end of the World War II the territory of Slovenian Istria was an agrarian hinterland of Trieste with the exception of the towns of Koper, Izola and Piran.

Agriculture: production of wine, olives and olive oil, fruit and vegetables for Trieste (especially important was the terrace culture on flysch slopes that reduced erosion, increased the cultivated surface and played an exceptionally valuable role in water retention; this was an example of the adaptation of agricultural practices to specific climatic and geomorphological conditions).

Salt Extraction: is an activity dating from the Middle Ages. The town of Piran grew on salt. The inhabitants of Piran owned cultivated land and also saltpans, which were an additional income source for them. As well as working in the field they worked seasonally in the saltpans. This is an important fact that demonstrates the adaptation of economic activity to the climate, since dry and hot summers were as welcome as wet and humid ones: in humid summers they harvested well in the fields and in dry ones on the saltpans. Sea salt was produced in the northernmost part of the Mediterranean using methods that were remarkably adapted to the environment (consolidation of the ground by the special petola technique, wind energy) and had interesting byproducts (salt mud, heavy salt water). This all created a rich material and cultural heritage, which enabled the launching and development of spa tourism at Portorož.

Even today, in spite of the abandonment of a substantial proportion of the surface, over 2000 tons of salt is produced annually here. The remarkable sustainable salt production in the Sečovlje saltpans is symbiotic with the environment, as the saltpans are rich with fish; the abandoned part of the saltpans is a Ramsar site. The Piran Saltpans Consortium received an award for successful work at the Vienna World Exhibition back in 1873 and at the recent Expo World Exhibition in Lisbon the saltpans were again exhibited at the Slovenian pavilion.

Shipbuilding: construction of boats and ships also dates back to the Middle Ages. Owing to important reserves of wood in the forested hinterland (the Mast Road!) and the need for boats (for trading, fishing and saltpans) shipbuilding developed in Piran, Izola and Koper, and still continues today.



The traditional trabakula for transport of salt and a bent tree: a desired form in shipbuilding; from the Sergej Mašera Naval Museum in Piran.



The Strunjan saltpans and the cart and wheelbarrow for salt transport.



Shipbuilding in Seča.



A wild oak tree as an example of a quality shipbuilding wood.



Fishing: the mixture of sweet and salt water represented good conditions for fishing, and the inhabitants of Slovenian Istria have known how to profit from it for centuries, through both fishing and shipbuilding. Organised industrial fishing started with the construction of the Izola fish-processing factory. Today, as well as classical fishing, mariculture (breeding of shellfish and fish) is gaining in importance.



The border zone between the freshwater and marine ecosystems at the edge of the salt pans is extremely rich with fish species.



The Sergej Mašera Naval Museum: workers sorting out the fish; the introduction of industrial fish processing into Izola changed the town.

Fishing nets on the pier in Piran.



The Izola Marina is a new harbour for foreign and domestic tourists.

In Portorož conventional tourism originated from spa tourism based on by-products from salt extraction: salt mud, heavy salt water.



Alongside traditional economic activities in the 1960s the greatest economic step toward progress was made by the construction and rapid growth of the Port and the City of Koper, the railway connection and modern transport terminals. Today the Port of Koper already annually handles more than 10 million tons of freight and is still expanding. The oil industry also holds an important share in regional development. Tertiary activities are economically the most important in the region, which developmental indicators show is competing with the most developed Central Slovenian or Ljubljana region.



If Koper is marked by growing transport (including highway construction) and related activities, to a great extent Izola and Piran are managing to intermingle their traditional and contemporary economic activities with progressively stronger orientation towards tourism development.

Smaller tourist facilities are more easily adaptable to the environment.

Trouble Report

State of the Environment

Sea

Due to its closed position and shallowness the Gulf of Trieste is an exceptionally sensitive ecosystem, particularly in the summer season when the temperature of the water increases, and at times of stable weather with bad air circulation. In the period of immobility of water masses when the bottom water is hardly lifted, the phenomenon of hypoxia of the bottom layer and the killing of benthos can occur. Simultaneously we can witness algal blooming and algal sliming that give an extremely unattractive appearance to the surface and the coast. Such a visibly unhealthy status is caused by organic influx that substantially exceeds the assimilating capacity of the sea.

Much of the pollution is caused by the local sewage of coastal towns that do not have adequate treatment plants. In certain weather conditions sea streaming burdened with polluted waters from the Po River makes the situation even worse. As the stable weather can last up to several weeks the organic burden in the sea in such periods gradually intensifies. The status of the water quality substantially improves when the dynamics are reconstituted, when winds and streams move the water masses again.

Maritime transport has greatly influenced the Bay of Koper. Loading of loose cargoes such as coal causes substantial emissions that reach the sea via air. The Bay of Koper is additionally burdened, together with the Škocjanski zatok Protected Area, by industrial emissions and direct waste disposal into the water environment. The Izola Shipbuilding yard is one of the significant sources of marine pollution.

Numerous and various fish populate the Gulf of Trieste and the catch in the Slovenian part has been estimated to approximately 2000 tonnes annually; an equal quantity is believed to be produced at fish farms. Pollution and the phenomenon of toxic algae in certain periods of the year are especially harmful to the breeding and consumption of shellfish.

Surface Waters

Slovenian Istria, whose geology is based on flysch, is crossed by the network of the Rižana, Badaševica and Dragonja Rivers. High waters occur in particular in the winter season and in summer the rivers almost dry up. Drying up is partially due to a small quantity of precipitation (1000mm/year, mostly in winter) and partially due to the large outtake for irrigation and fresh water supply, especially at the source of the Rižana River. Owing to the exceptionally low flows in the dry season the rivers and streams of Slovenian Istria do not have sufficient sewage reception capacity, so during summer the Rižana falls into the 4th quality class. The situation is slightly better in the Badaševica and the Dragonja, which are protected from sewage problems by the marine water.

Scheme of the summer circulation on the Gulf of Trieste: intrusion of dense northern Adriatic water (blue arrow), its mixing with the surface freshwater and outflow of freshwater (orange).



Location of the main point sources of pollution (municipal treatment plants: Koper - St. 00KB, Izola - St. 00IA, Piran - St. 00PA; and Delamaris treatment plant - St. 00DE), estuaries of rivers (Rizana) - St. 00RI, Badaševica - St. 00BA, Drnica - St. 00DN, Dragonja - St. 00DR) and wastewater outfalls (Piran outfall - St. 00PO and Izola outfall - St. 00IO) along Slovenian coastline. Scheme by V. Turk.



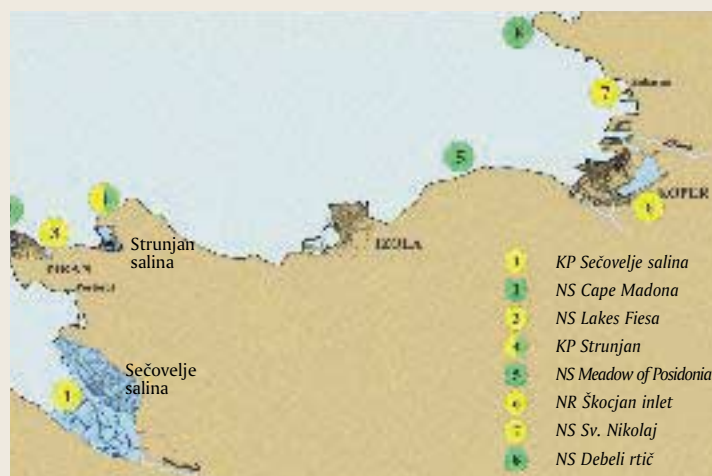
A Piran street adapted to the slope by its construction material and form.

Air

Frequent winds result in a rather good air quality. The principal source of pollution is transport, which is the densest on the main highways; there we also register the highest concentrations of hydrocarbons, CO₂, NO_x and CO. Transport emissions increase severalfold in July and August when high temperatures produce ozone. After transport, air quality is most affected by industry in Dekani and often by the Port of Koper (loose cargoes).

Soil

So far, research has shown that in certain parts of the rural hinterland traces of copper and nickel can be found owing to the phyto-pharmaceuticals used in vineyards. Overmanuring of the ground does not occur yet, however the impact of emissions of increasing traffic is noticeable.



Protected areas in the Dlovenian coastal area (Legend: LP – landscape park; NR – nature reserve; NM – natural monument; yellow – coastal wetlands; green – marine protected areas.

Protected Areas

Owing to their geomorphology, flora and fauna, the protected areas represent an extraordinary enrichment of Slovenian Istria on land as well as in the coastal region and under the sea. As the contact point between the sea and the land the protected areas cover almost one fifth of the coast. With their exceptional biological diversity these areas help to create a balance within an economically very active region.

The protected areas correspond to the zone of “endangered areas”, where natural phenomena such as crumbling cliffs or floods at the river estuaries do not allow for classical intensive economic activities.

Protected areas are like green vegetation islands that mitigate the impact of traffic, noise and various emissions. In addition they retain precipitation and humidity, lower the temperature in summer and thus create a more agreeable microclimate. This influence is of particular importance in summer as it increases the attractiveness of tourist and urban complexes located nearby, and hence the economic importance of protected areas is obvious and can be further increased with the marketing of “nature” as an additional tourist offer.



The Strunjan salt pans are also an important wetland – a “Ramsar locality”.

Adventures Ahead

Problems and Opportunities

Fresh Water

At the peak of the tourist season, which coincides with the dry season in the region, the central water source of the regional Rižana waterworks barely satisfies the demand. In order to ensure additional quantities of water in cases of drought it has been connected to the karst water system. The Rižana waterworks is also connected to wells in the Dragonja Valley and to pumps that are today located on the other side of the state border in Croatia. In addition the water supply system has been thoroughly renovated in recent years, including precise route control and reduction of water losses in the system. The introduction of an economic price for water, which is now the most expensive in the country, has also directly contributed to the additional reduction of environmental hazards. The high price of water stimulated discontinuation of unreasonable practices, including irrigation with fresh water and technologies which are dirty and wasteful of water.

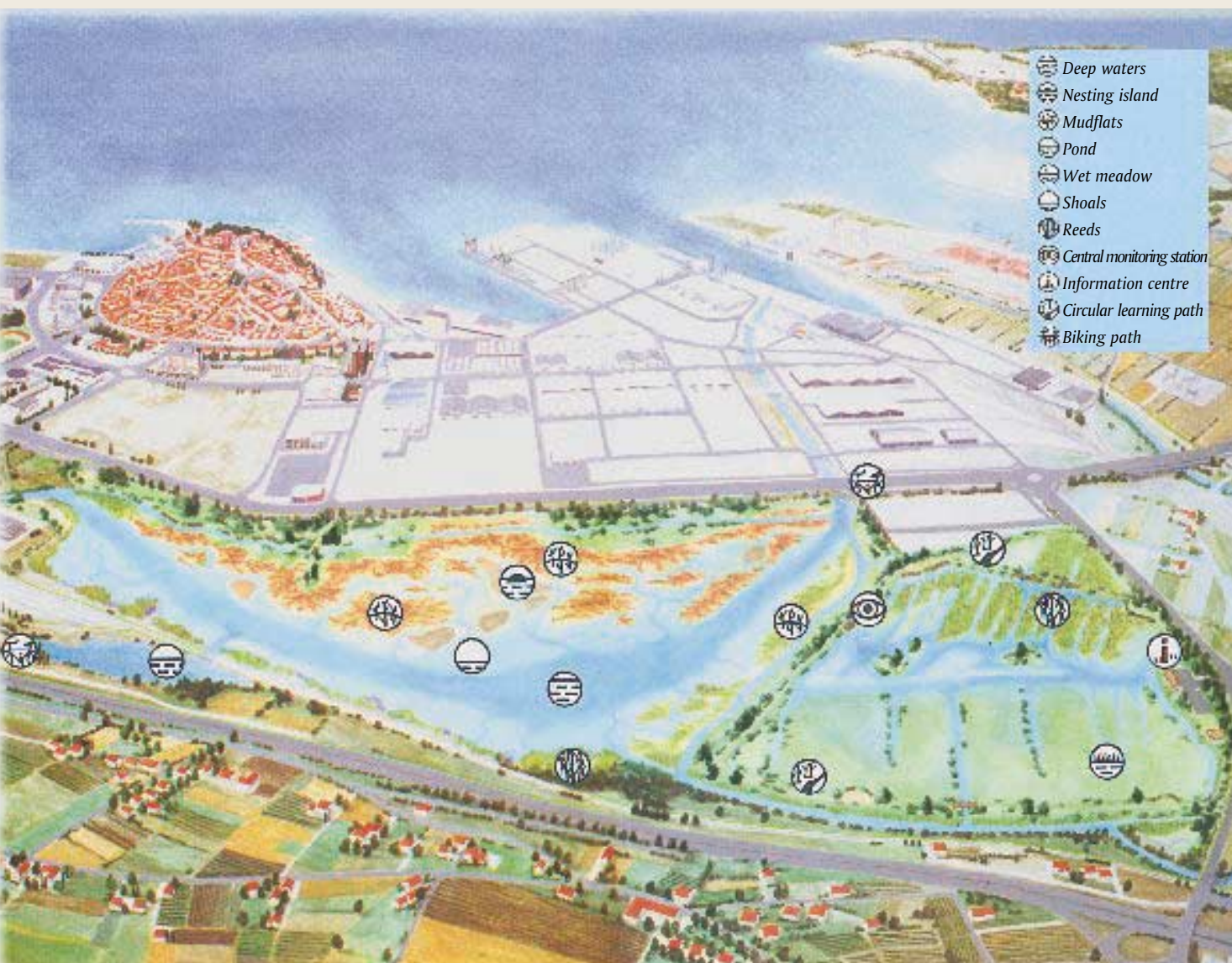
The central water source is potentially most threatened by transport activities, in particular by the Kozina-Rupa road connection and the Koper-Divača railway connection that both cross the immediate hinterland of the pump. Prohibition of the transport of fuel derivatives and other substances hazardous for water on the Kozina-Rupa road has proved to be an efficient preventative and also an economically acceptable protective measure for the water source. The threat to the water source due to rail transport can be reduced by immediate implementation of basic protection measures: installation of intercepting shafts and embankment monitoring points, that could be carried out as preparatory activities for the planned construction of the second rail link between Koper and Ljubljana.

Water Volumes and Ecosystems

The pressure of human activities on water ecosystems is constantly increasing primarily owing to accelerated regional economic development. Emission pressures are caused by agriculture, transport and industry. The pressure of human activities on water ecosystems is constantly increasing primarily owing to accelerated regional economic development. Emission pressures are caused by agriculture, transport and industry. Quantity constraints are caused primarily by domestic use of water and by irrigation in agriculture. Man causes physical pressures as he changes the natural role of waters on land, coast, sea and undersea as part of his economic activities. For that reason we are faced on the one hand with pollution and drought and on the other with substantial and unnecessary damage. New projects for activities which do not take the water world into consideration can cause damage even during normal precipitation. Beside the damage that can be directly evaluated financially and that occurs after the water source has been polluted (the cost to provide substitute water), and damage due to floods, there is also indirect damage. Coasts and embankments lose their original appearance and attractiveness that represent important economic potential, especially in a tourist region. In such circumstances measures such as the establishment of the Škočjanski zatok Nature Reserve can represent an excellent

Lokev or kal is a water collector which is environmentally remarkably adapted to the Karst where there is no surface water. Its purpose is to ensure water supply for horses (transport) and other animals. In summer children could swim there and skate in cold winters. Its anthropogenic ecosystems are also interesting.





The Škocjanski zatok protected area – an attempt to establish a symbiosis among the town, the port and the local ecosystem (the MESP- ARSO brochure).

development opportunity through the integration of sectoral development activities.

The 1998 Act on the Škocjanski zatok Nature Reserve has considerably changed our position on water and aqueous ecosystems. The shoal that in previous centuries separated Koper from the mainland has gradually been filled up with various materials, often with waste. The rest of the shoal was intended for the progressive urbanisation and development of the Port of Koper and to carry the new roads. At the implementation of the legislation creating the Reserve, a coordination process started between the town and the state on the possible revitalisation of this degraded yet important water ecosystem on the town's very doorstep.

The conservation and revitalisation of this water space and ecosystem was a substantial step toward a development practice that could rapidly in a few years bring the town some important benefits, provided that the partnership dialogue is maintained. As part of a rethought developmental urban scheme that includes water and water space as an important factor, Škocjanski zatok could substantially improve the quality of life in the town and its surroundings. The mitigating effects of high water inflows would cause natural

processes of sedimentation and self-purification of waters before the outflow into the sea, that in combination with the renovation of the waste water treatment plant could visibly improve the quality of bathing water at Žusterna and Ankaran. The approach to management of the Rižana, Badaševica and Dragonja river basins is being similarly integrated. It brings about numerous economic advantages which are all in the public interest, such as the conservation of the quality of the Rižana river basin and reduction of the harmful impact of flooding waters. All of these measures will also have a positive impact on biological diversity.

Protected areas

Protected areas functionally complete the protection of water resources that is the central long-term objective of all three local communities in the Rižana river basin. Contemporary settlement trends, namely an extremely low-density hinterland with less than 20 inhabitants per square kilometre and still depopulating, are in favour of the implementation of this objective. Former cultivated land has been completely overgrown for decades. The reverse process is taking place along a relatively narrow coastal strip where a high concentration of inhabitants (i.e. consumers of water) is building up with a current density of over 400 inhabitants per square kilometre. There is a realistic possibility that the region could use its protected areas in its development strategy as a mechanism for the protection of smaller water sources that once already supplied local waterworks. The quantity of such sources in the total balance of all available fresh water is not negligible, and the small sources could function as an additional resource in a water supply system which is currently highly centralised. This way the level of autonomous supply of some settlements could be substantially increased. Such a measure could also result in a more responsible attitude by consumers toward water consumption and pollution, as they would feel obliged to care for their “own” water source. Simultaneously the pressure on consumption of water in the central system would be at least symbolically reduced.

The environmental-economic importance of protected areas is obvious, when we look at their role from all aspects. Marketing of “nature” as an additional tourist offer can further increase its economic impact.



Nature reserve Strunjan.



Fresh water pond in a former clay mine has increased the biological diversity of the bay.



The saltpan house (Sečovlje 152) with the door to the sea.

Blue on White

Legal and Policy Framework



The Piran lighthouses.

Slovenian Legislation and Policy

In 1993 the Republic of Slovenia adopted the Environmental Protection Act, which complies with the basic principles of Agenda 21: the principle of integration of the environment, cooperation, prevention, the polluter pays principle, compulsory insurance, compulsory subsidy measures, promotion, public participation and the principle of protection of rights.

Natural public good and natural resources are two extremely important principles of Agenda 21 which are enshrined in the Environment Protection Act, in Articles 16 and 17.

Article 16 (A Natural Public Good)

- (1) A natural public good comprising ecosystems of arable lands, forests, the underground world, water systems, the sea, and infertile land is the property of the Republic or the local authorities. The distinction between a natural public good belonging to the Republic and a natural public good belonging to a local authority and the general conditions for its exploitation shall be established by law.
- (2) A natural public good may be exploited only in ways which do not threaten its substance or impair its natural role.
- (3) The principle cited in the preceding paragraph applies in setting conditions for the acquisition of special rights for the use of a natural public good and in the case of the regulation of other conditions prescribed for its use (secondary uses).
- (4) The status of natural public good for a particular area shall be assigned, annulled, or reinstated by government or local authority regulation. The regime of use shall be defined with the proclamation of the status.
- (5) The status cited in the preceding paragraph may only be reinstated or cancelled on the basis of planning laws.

Article 17 (Natural Resources)

- (1) Water, minerals or mineral ores, wild animals such as deer and fish, and other wild economically exploitable water flora and fauna in open waters and fishing seas are the property of the Republic. The Republic and the local authorities are responsible for the protection of the air.
- (2) The acquisition and enjoyment of property rights to land and forests may not threaten their ecological function.
- (3) Categories of natural resources which are considered natural treasure, their protection, and conditions for economic exploitation of natural resources shall be prescribed by law.
- (4) In prescribing the conditions cited in the preceding paragraph under which qualitative or quantitative economic exploitation may encroach on natural resources, their scarcity, endangerment, and ability to regenerate must be taken into consideration.

Environmental Protection Act (UL RS, 23/93)

In 1991 the National Assembly adopted the Resolution on the Maritime Orientation of the Republic of Slovenia (UL RS 10-403/1991). The Resolution emphasizes the importance of the maritime orientation of economic development and lists the relevant steps in this direction:

- establish the Port of Koper as an important Central European port with low environmental impact;
- promote restructuring of coastal activities with a harmful environmental impact and no developmental potential;
- **promote within reasonable limits the production of food and other goods from the sea (fishing, mariculture, salt production etc.), develop agriculture as an important component of regional development by considering regional expertise, climatic factors, autochthon traditions and cultural features;**
- provide conditions for improvement of coastal marine quality by prescribing the manner and conditions for changes to communal infrastructure, limiting and prohibiting ecologically hazardous activities, signing agreements with neighbouring maritime countries, establishment of a service for permanent monitoring of marine quality, and other measures;
- protect parts of the coast and the sea by spatial management regulations (green belts, reserves, cliffs and other natural monuments) and ensure coordinated urban development with an emphasis on the protection of coastal cultural-historical features of the town centres of Piran, Izola and Koper (in particular the traditional harbours and beaches) and coastal particularities (saltpans);
- The Republic of Slovenia needs to ensure a maritime legal framework in accordance with international law. For this reason it will:
 - establish a service for marine and coastal monitoring in areas of safety, navigation, ecology, sanitation and taxes;
 - establish a service able to efficiently provide for marine and coastal purification and develop relations with neighbouring countries that will ensure full cooperation of the Northern Adriatic countries using all means available to prevent the potential consequences of larger pollution.

Legislation of the European Union

Also based on the integration of the environment is the EU Water Framework Directive adopted by the European Parliament and the European Council (2000/60/EC) that establishes a framework for joint action in the area of waters and represents an important step toward sustainable use of water sources in Europe. It requires an integral and thematically precisely defined approach to water management, and lays down deadlines for preparation of management plans for river basins, which include river estuaries and coastal waters. The common objective of the Directive is to reach “a good condition of waters” and its contents have been adopted in the new draft Slovenian Water Act.

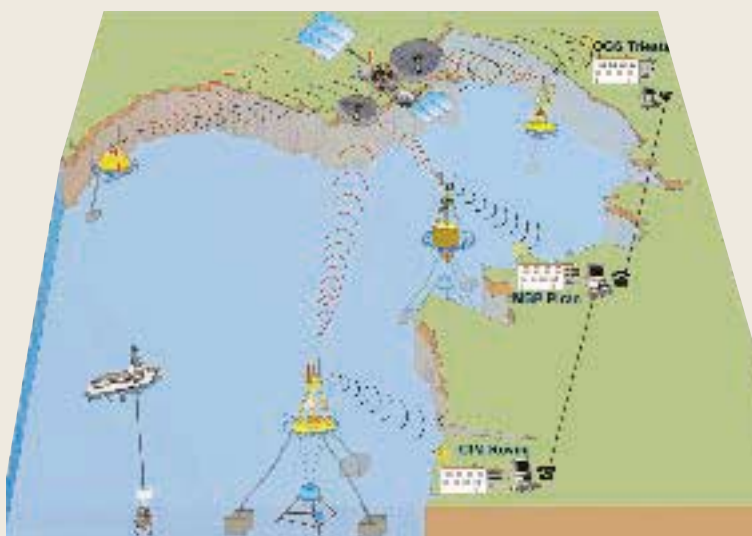
The Dragonja is the border river between Slovenia and Croatia. It connects more than separates. It connects not only the river, saltpan and marine ecosystems but also water supply systems with rich wells at its embankments just before it flows into the sea. For these reasons we are preparing a joint river management plan.



International Cooperation

On the basis of the Treaty on Cooperation in Protection of Waters of the Adriatic Sea and the Coastal Areas against Pollution, the Republic of Slovenia inherited the treaties of the former Yugoslavia with the Republic of Italy (UL RS-MP11/92). These treaties represent a foundation for the work of the Mixed Slovenian-Italian -Croatian Commission for the Protection of the Adriatic Sea and the Coastal Areas Against Pollution that is active in areas of research concerning the quality of the Adriatic Sea, the coordination of pollution prevention systems, environmental safety of maritime transport and integrated coastal management. On the basis of adopted agreements Slovenia has initiated the establishment of an up-to-date system (an anchored buoy) for integrated monitoring of the quality of the Gulf of Trieste. The buoy near Piran and Trieste is already in place and the collected data are publicly accessible.

Oceanographic buoy with measuring instruments is located about 1 mile off Piran; a scheme of an up-to-date network for integral quality monitoring of the Gulf of Trieste.



Together with Croatia, Slovenia has also prepared a proposal for the modernisation and coordination of services in case of marine pollution incidents. Italy is still studying the proposal. Slovenia has also launched activities related to the preparation of water management plans, including coastal waters (EU WFD) and the integral Slovenian coastal management plan.

Adriatic-Ionian Initiative. On May 20 2000 in Ancona the Foreign Ministers of the Adriatic countries together with Greece and the European Union signed the Ancona Declaration that defines intensified subregional cooperation in the area of the environment. Slovenia as a member of the working group on the environment emphasized the urgent need to implement the Mediterranean Action Plan (UNEP-MAP) at an accelerated pace in the Northern Adriatic, because it is a closed sea and an exceptional transport hazard.



Inspiring Direction

The Barcelona Convention

The Convention with Protocols

The Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (The Barcelona Convention) includes the principles of sustainable development adopted as Agenda 21 in Rio de Janeiro in 1992. The contracting parties should ensure sustainable management of natural marine and land-based resources and include environmental protection principles into social and economic development and land use. The contracting parties should protect the marine environment and coastal regions by preventing both deliberate and accidental pollution. They should protect nature, improve the regions and landscapes which are of ecological and cultural value and reinforce cooperation among the Mediterranean countries in the use and management of their common heritage and natural resources.

The following Protocols to the Convention were amended or added:

The Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources (Land-based Sources Protocol).

Since the amended Protocol now regulates protection against pollution from both land-based sources and from land-based activities the contracting parties decided to change its title to the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities. With amendments to the Protocol its area of enforcement was enlarged to include the entire hydrologic basin of the Mediterranean Sea, including underground waters connected to the Mediterranean Sea and the input of substances that pollute or are airborne into the Mediterranean region from land-based sources or activities in the contracting parties.

The Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA and Biodiversity Protocol).

The Protocol includes the principles of sustainable development and protection of biological and landscape diversity adopted by Slovenia within Agenda 21 in Rio de Janeiro and more specifically lists plant and animal species that need to be protected in the Mediterranean region. The implementation of the Protocol means integrated management of coastal regions and the inclusion of endangered species and habitats, i.e. biological diversity, in development plans. The Protocol among other things provides that the contracting parties, on top of general protection obligations, are obliged to create protected areas, define national strategies of protection of species, create inventories of elements of biological diversity etc.

The landfill of the Piran Municipality is located in the lower Dragonja Valley.



The leachate waters draining into reed beds where they are purified.

The SAR Speed Rescue boat of the Naval Authority of the RS, which cooperates with the Ministry of the Environment and Spatial Planning in the implementation of the Barcelona Convention.



The Protocol for the Prevention and Elimination of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft or Incineration at Sea (Dumping Protocol).

The amended Protocol prohibits waste incineration at sea and that is why it has been renamed Protocol for the Prevention and Elimination of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft or Incineration at Sea. The Protocol defines the term “incineration at sea” as deliberate incineration of waste or other substances in marine waters of the Mediterranean Sea with the purpose of thermal destruction and does not include activities related to the normal functioning of ships and aircraft. The original system of the Protocol continues to be in force.

The amendments and additions to the Barcelona Convention and its Protocols were adopted by the Slovene Government in November 2001 and sent for ratification to the National Assembly.

An amendment to the Emergency Protocol has also been prepared under the new title Protocol Concerning Cooperation in Combating Pollution of the Mediterranean Sea by Oil and other Harmful Substances in Cases of Emergency.

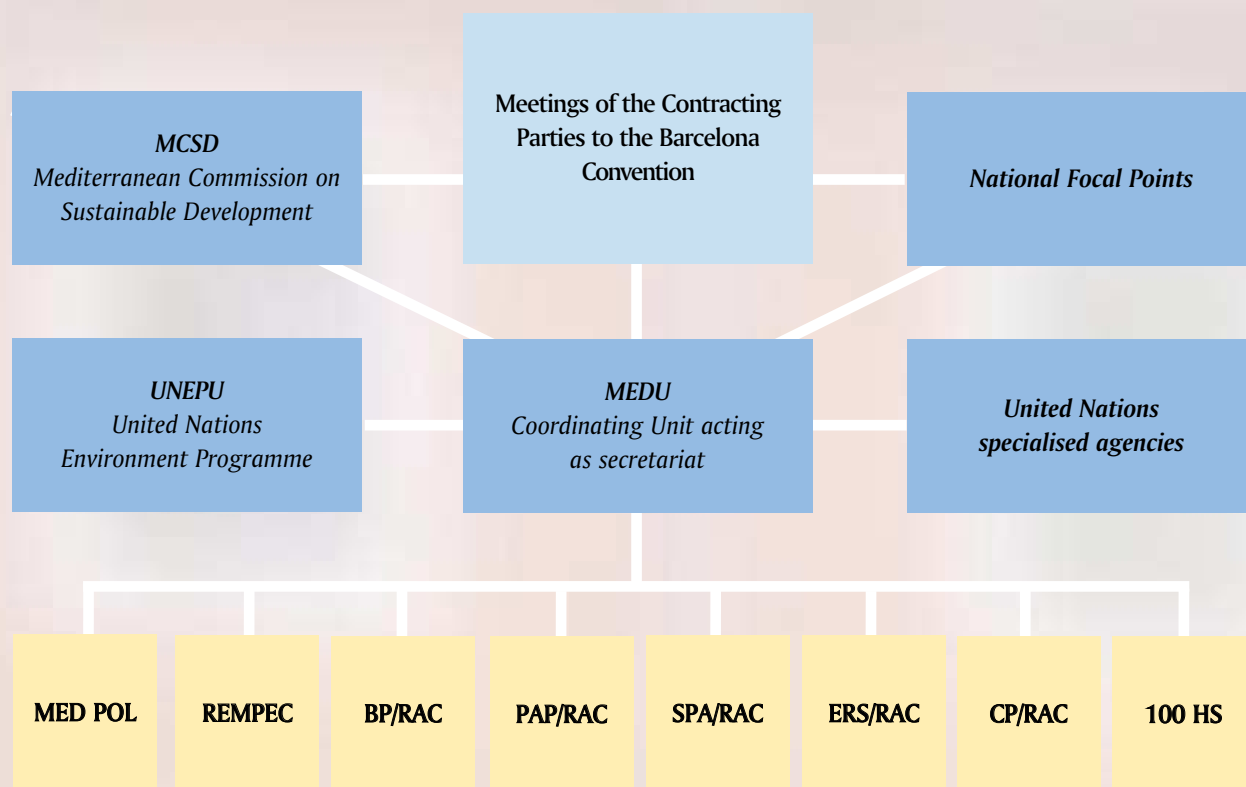
Slovenia has not yet signed the Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil (Offshore Protocol), or the Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal (Hazardous Waste Protocol).



The Service for Protection of Coastal Waters is in charge of intervention in cases of sudden pollution caused by mineral oils and other substances.



Institutional Structure of the Mediterranean Action Plan (UNEP/MAP)



The Regional Programme

The **Mediterranean Action Plan (MAP)** was the first regional maritime programme of the United Nations Environment Programme. It was launched in 1975 following the Barcelona Convention, and twenty countries are now actively involved in conservation of the Mediterranean Sea. In 1995 the Programme was extended so that it now reflects the contemporary understanding of relations between the environment and development from the sustainable perspective.

The **Mediterranean Action Plan** is managed by the coordinating unit in Athens (**MEDU**) and is composed of the Mediterranean Commission on Sustainable development, the Programme for the Assessment and Control of Pollution in the Mediterranean region (**MED POL**), six regional activity centres, and the Programme for Protection of Coastal Historical Heritage, as shown in the following diagram:

Connection of Slovenia with the MAP and the Barcelona Convention

Slovenia became a contracting party to the Barcelona Convention at the COP 8 in Turkey in 1993. In 2001 at the COP 12 in Monaco Slovenia became a member of the Bureau of the Barcelona Convention. In addition Slovenian institutions actively participate in numerous other international projects for monitoring and improvement of the status of the sea and the coast.



Slovenian minister of Environment and Spatial Planning with the Head of the METAP Programme and the coordinator of the Barcelona Convention in the boat under the cliffs in Strunjan.



Meeting of the Permanent Slovenian-Italian- Croatian Commission for Protection of Adriatic Sea and Coastal Areas against Pollution, Trieste, January 9 2002.

The Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC/RAC) offers to its partners all information and logistical assistance in case of environmental accidents at sea. To Slovenia the REMPEC offers technical assistance in the preparation and verification of contingency plans in case of environmental marine accidents. It participated in the preparation of the Slovenian-Croatian Cooperation Plan in Case of Marine Accidents that was also proposed to Italy. The Regional REMPEC Centre suggested that the Port of Koper should cooperate in the preparation of contingency plans in case of accidents with liquid chemicals.

The Blue Plan studies environment and development inter-relations and prepares tools and indicators. Slovenia has actively participated in this programme by testing indicators on the environment and development. Experts from the Ministry of the Environment and Spatial Planning, the Bureau for Macroeconomic Analyses and the Water Management Institute performed the testing.

The Priority Actions Programme (PAP) deals primarily with integrated planning in coastal regions and is a leading centre for the preparation of national and international coastal development plans in the Mediterranean. In Slovenia the PAP will be technically involved in the preparation of the Integrated Coastal Management Plan.

The Specially Protected Areas Regional Activity Centre (SPA/RAC) develops methodologies for protection and for the preparation and implementation of management plans in protected areas. The Piran Institute for Conservation of Cultural Heritage closely cooperates with the Centre that among other things is a financial shareholder in the project to establish protected areas in Slovenia.

Research boat of the Marine Biology Station, National Institute of Biology (MBS, NIB).



Environment Remote Sensing (ERS) by using satellite pictures completes the data on environmental processes in the Mediterranean for planning purposes.

The Cleaner Production Regional Activity Centre (CP/RAC) disseminates information on the use of cleaner technologies, their advantages and usefulness, by transferring knowledge and methodology.

Slovenia is also actively involved in the activities of the **Mediterranean Commission on Sustainable Development** at the request of which it prepared an extensive analytical study and tested 55 environmental indicators in the local communities of Koper, Izola and Piran and transmitted the report to the Mediterranean Commission on Sustainable Development. This important Commission is preparing a report for the UN World Summit on Sustainable Development which will be presented to all of the world's heads of government.

School of Salema (Sarpa salpa) near punta piran.



The Marine Biology Station: Research and Monitoring of Marine Quality

It is the limited coastal and marine space that dictates that Slovenia pays the greatest attention to its development, which should be coordinated as much as possible with strict environmental requirements. We are aware that we also need developmentally oriented knowledge in the area of marine sciences, and this was demonstrated by the foundation of the Marine Biology Station (MBS), which has acquired a high national reputation in its more than three decades of existence.

Today the Marine Biology Station of the National Institute of Biology is participating as an equal partner in various regional, European and other international research and development projects. These deal with natural features of inshore waters; possibilities for balanced use of marine natural resources; gathering and dissemination of information i.e. knowledge about the sea; environmental issues resulting from human activities; and seawater quality.

Of special importance among these projects is participation in the Programme for the Assessment and Control of Pollution in the Mediterranean region (MED POL), which is part of the Mediterranean Action Plan. The MED POL Programme was launched more than a quarter of a century ago and Slovenia has been an active participant ever since. At first Slovenian institutions participated within the Yugoslav National Programme (1975-1991); after 1994 Slovenia as a contracting party to the Barcelona Convention prepared a programme in accordance with its own needs.

Among the principal objectives of the Programme are the collection of reliable data on the level of pollution of the sea with various substances and their sources; the effects of pollution on the marine environment and organisms; compliance with various environmental regulations; and changes over time in the status of the marine environment. The collected data should then determine which measures should be undertaken for environmental improvement, and also serve to monitor the effectiveness of interventions. In addition, the MED POL Programme requires periodical national reports on land-based point and non-point sources defined in the Land-based Sources Protocol, monitoring reports on "marine pollution hot spots" and reports on other activities which are relevant to marine quality. Every four years a national report on the status of the marine and coastal environment must be prepared.

The Programme "Research into Marine Quality and Pollution Monitoring" (1998-99) has been prepared taking into consideration the natural features of the Gulf of Trieste, the pollution hazards from various land-based sources and the activities taking place at sea, all in accordance with the Mediterranean MED POL Programme and national legislation. As well as the MBS and the National Institute of Biology the Regional Institute of Public Health for Koper and the Jožef Stefan Institute's Environmental Science Department are also participating in the implementation of the Programme.



The mariculture in the Slovenian sea and the research carried out by the Marine Biology Station.

In situ measurements of the primary production.



Ripples of sediment near promontory Debeli rtič.



Winds of Change

The Actors

Institutions managing waters, environmental protection and nature at the coast:

Hidro Koper Company for Construction and Water Management
Obrtniška 15
6000 Koper
tel.: 05 613 30 00,
fax.: 05 613 30 11

Ministry of the Environment and Spatial Planning
Agency of RS of the Environment, Regional Office Koper
Pristaniška 12
p.p. 115
6000 Koper
tel.: 05 639 84 96,
fax.: 05 639 84 95

Ministry of the Environment and Spatial Planning
Inspectorate of RS for the Environment and Spatial Planning, Regional Unit Koper
Trg Brolo 4
6000 Koper
tel.: 05 663 23 40,
fax.: 05 663 23 41

Institute for Conservation of Cultural Heritage of Slovenia, Regional Unit Piran
Trg bratstva 1
6330 Piran
tel.: 05 673 15 37,
fax: 05 673 15 36

The Ministry of the Environment and Spatial Planning included in the National Environment Protection Action Plan a decision on the institutional reinforcement of regional services that in 2001 were reorganised into Regional Offices of the Agency of the Republic of Slovenia for the Environment. Such a reinforcement was necessary, since the situation of the coastal region and the related integrated management of water resources is highly complex. The offices will coordinate the implementation of administrative tasks, management of a public service for protection of the coastal sea against pollution, registration of environmental data, and management regimes in protected areas.

In 1993 the Ministry of the Environment and Spatial Planning invested into the renovation of the saltpan dyke that made possible the conservation of a legally protected natural and cultural monument, the Sečovlje saltpans. The conserved symbiosis of nature, economic activity and culture was the motto of the celebration of the 1st World Water Day in the Republic of Slovenia. The Minister of the Environment and Spatial Planning invited all the environmental nongovernmental organizations and Slovenian expert public to the celebration. At the occasion information panel boards were exhibited carrying the message "Let Us Protect Waters" aimed at raising public awareness on the fundamental importance of waters. The symbol on the panel board emphasizes an integrated treatment of running waters and the sea and they are now exhibited at all of the most frequently visited water spaces in the region.

In the last decade the Ministry of the Environment and Spatial Planning has co-invested in the construction of communal infrastructure, the project for improvement of water supply and maintenance of water streams and activities of the Service for Protection of Coastal Waters. In 2001 the Ministry of the Environment and Spatial Planning managed the project of modernization of communal water treatment plants at Koper, Izola and Piran and co-financed and managed the preparation of the Regional Environmental Protection Action Plan.



Environmental Protection Action Plan for Slovenian Istria

The Plan was prepared in 2001 and is designed as a process with an action programme for the period until 2006. The Environmental Protection Action Plan for Slovenian Istria primarily deals with the issue of water sources, protection of water quality (protection regimes for local communities, industry, the roadsides), water supply, wastewater treatment, and manners of wastewater outfall into the sea. It also includes the issues of protected areas, the regional concept of waste management, and traffic regulation, including cycle paths, among the important measures.

The most important part of the Action Plan, i.e. 13 from 16 proposed measures, confirms water in all three local communities as the basic environmental element that needs clearly defined development goals for conservation and the improvement of quality and quantity.

The measures will be supported by establishment of an efficient system of information on the status of the environment and public services. The conclusion that can be made based on the priority topics of the Environmental Protection Action Plan for Slovenian Istria is that, until now regional development planning has not sufficiently taken water resources into consideration, when today they represent an increasingly important economic factor. The region has now become responsibly aware of the fact that water is its most important natural resource.

The principal recognition and consensus is the fact that we need integrated and responsible water management in order to ensure development of Slovenian Istria. In other words, water is the key to the sustainable development.

Coastal Management

In Slovenia, responsibilities directly or indirectly related to the management of the coastal area are distributed between different subjects at the state and local levels, which does not support integrated coastal area management. The National Environmental Action Programme, adopted in 1999, defined the lack of co-ordination between those subjects as an urgent problem and defined the following objectives, related to the management of Coastal Area:

- to improve the co-operation between ministries and regional and local authorities; and
- to investigate the possibility of introducing public administration at the regional level or lay down a procedure for co-operation among municipal authorities and between them and the national administration.



The Ministry of the Environment and Spatial Planning on March 22 1993 dedicated the celebration of the 1st World Water Day (UN) to the salt pans where the freshwater and marine ecosystems mingle and where a balanced economic activity of mineral production flourishes. They made panel boards that inform the inhabitants and visitors on the importance of water sources.



The SVOM Boat for pollution intervention.



The streets of Piran are adapted to the slope in material and form.



Enclosure made of local stone close to Piran.

In the framework of the Act regulating the Promotion of Balanced Regional Development, passed in 1999 the Regional Development Agency (RDA) for South Primorska region was established in Koper. It covers eight municipalities, three of them at the Coast, the others from Karst and Brkini. The area of these municipalities correspond to the Adriatic river basin in Slovenia and thus gives an ideal organisational framework for Integrated Coastal and River Basin Management. The Agency is responsible for the preparation of the Regional Development Programme (RDP) by the end of November 2002, - in line with the principles of sustainable development - its implementation, monitoring and evaluation. The RDP will include not only economic, social and other sectoral development plans, natural resource management plans and pollution control programmes, but also a regional master plan.

The management structure of RDA for South Primorska follows guidelines from the PHARE project Coastal Area Management in Slovenia. Its committees play an important role also in specific fields, such as integrated water management at the river basin level, within the framework of the EU Water Framework Directive, acting together with the authority responsible for river basin management, by providing for a common approach and common objectives, principles, definitions and basic measures.

By setting up the agency, Slovenia will fulfil the requirements of the EU in the field of regional policy, but also the National Environment Action Programme, which called for a regional public administration to improve the management of the coastal area. Using the experience gained from its participation in the MCSD (Mediterranean Council on Sustainable development), the agency will apply relevant guidelines, including the monitoring of environmental indicators.

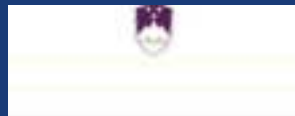
In 2002 the Republic of Slovenia will start to prepare an Integrated Coastal Management Plan, in partnership with UNEP - MAP. The Plan will include all the elements of the Barcelona Convention and its protocols as well as take into account local environmental conditions, which will determine the development of this most northern bay of the Mediterranean, shared by three countries.

Published by:
The Ministry of the Environment and
Spatial Planning of the Republic of Slovenia,
Dunajska c. 48, 1000 Ljubljana, Slovenia,
Phone: +386 1 478 7335, Fax: +386 1 478 7415,
e-mail: milena.janezic@gov.si

The publication was produced with the support of UNEP/MAP
UNEP/MAP does not necessarily agree with the contents of this brochure.
UNEP/ MAP Coordinating Unit, Athens, Greece
Phone: +301-7273100
Fax: +301- 7253196-7
email: unepmedu@unepmap.gr
web: www.unepmap.gr

Ljubljana, January 2002

Author of concept and text: Mitja Bricelj
Author of "The Marine Biology Station" article: Alenka Malej, Ph. D.
Author of "Coastal Management " article: Slavko Mezek
Design: Andrejka Čufer
Computer illustrations: Leonard Rubins on pages 4, 6, 8
and gulf stream illustration in image on page 7
Photos: Mitja Bricelj;
Bojan Breclj (cover page main picture);
page 4 Poseidonica SPA/RAC and ZVNKD Piran;
Nature Reserve Strunjan and photo on back cover ZVNKD Piran;
Archive of The Marine Biology Station Piran: photos on page 11 (top), 18, 22 (bottom)
and 23 as well as illustrations on pages 5, 11, 12, 18; J. V. Valvasor engraving on page,
Library of the National Museum in Ljubljana.
Translation: Cirila Toplak, Ph. D.
Printing: Medium d. o. o. Žirovnica
Litography: B&T, Bled



with the support of UNEP/MAP