Environment in your pocket

1 - 2005

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ENVIRONMENT AGENCY

ENVIRONMENT IN YOUR POCKET

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ENVIRONMENT IN YOUR POCKET

Introduction

Environmental information has always been of interest to environmentalists and the general public alike. It is also of particular importance to decision-makers, i.e. the Government and Parliament of the Republic of Croatia, as an aid for environmental policy making and for monitoring the implementation of defined measures.

This pocket book describes in a practical format a selected group of indicators representing the state of the environment and environmental trends in Croatia today.

The pocket book presents, for the first time, some of the important environmental indicators for water, sea, air, soil, and waste in a simple and clear form. It informs the professional community of the approach and form to be used in future, more systematic and comprehensive, overviews, with further indicators, enabling a more realistic assessment to be made of the state of the environment in Croatia.

We believe that this brochure pocket book will facilitate the interpretation of the more detailed reviews to come, and contribute to the understanding of the environmental changes that have already occurred and the challenges the environmental sector in Croatia will be facing in the future.

Croatian Environment Agency

ENVIRONMENT IN YOUR POCKET

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Croatia basic information

Mainland surface area	56,594 km^2
Territorial sea surface area	31,067 km^2
Coastline length	5,835.3 km
Islands, rocks, reefs	1,185
Highest mountain summit	Mt. Dinara, 1,831 m
Counties	21
Cities and municipalities	550 (124 and 426)
Population	4,437,000
Population density per km^2	78.4
Agricultural households	448,532
Inhabited islands	47
Language	Croatian
Alphabet	Latin
Political system	Parliamentary democracy
GDP per capita	USD 5,134.5

AIR - CLIMATE

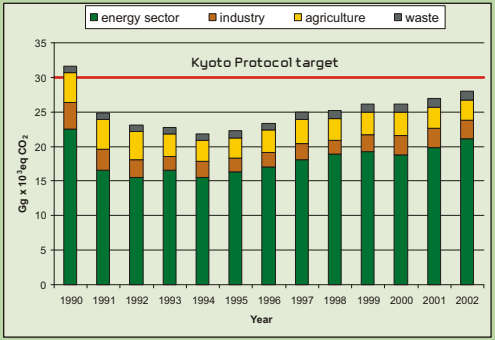
Greenhouse Gases Emissions

Six greenhouse gases (GHG) - CO_2 , CH_4 , N_2O, HFC, PFC and SF_6 - resulting from human activities cause increase in global temperature and directly cause climate change, sea level rise, desertification, etc.

Trend and Current State

In 2002, the total GHG emissions were 27,961 kilotonnes, calculated as CO_2 equivalent, which is 11.5% less than in 1990. Of the 1990-2002 greenhouse gas emissions, CO_2 accounted for 67-77%, CH_4 and N_2O accounted for 10-15% each, and HFC about 0.2%. The emissions between 1991 and 1994 fell, due to the war raging in the country. From 1995 to 2002, the greenhouse gas emissions gradually increased, by 3.3% a year on average. Under the Kyoto Protocol, between 2008 and 2012 Croatia should reduce its emissions by 5% compared to 1990. If the current emission increase rate was to continue, the Kyoto Protocol emission limits would be exceeded by 2005.

Greenhouse gases emissions by sectors



Year	1990	1995	2000	2001	2002
Total GHG emission (Gg eq-CO_2)	31,609	22,259	26,097	26,892	27,961

Source: Ekonerg

AIR - CLIMATE

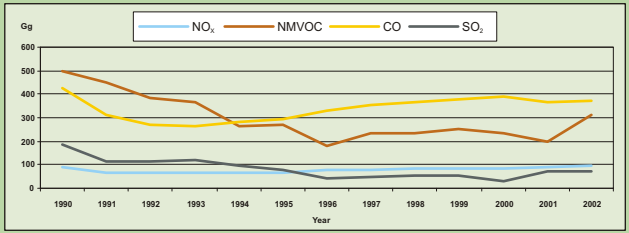
Ozone Precursor Emission

Compounds like gases CO, NO_x, NMVOC, in presence of solar radiation react with other compounds to form ozone. In such way they indirectly contribute to the greenhouse effect. SO_2 also participates in these reactions. It affects public health when forming an aerosol (smog).

Trend and Current State

In 2002 the major sources of NO_x emissions are road traffic (about 50%), power generation and industrial processes. NO_x emissions have been slowly increasing because of the increase in road traffic volumes. CO emissions, mainly from traffic and small household furnaces, are 12.3% lower than in 1990. Industrial processes are the largest NMVOC emissions source. Compared to 1990, the NMVOC emissions have been reduced by approximately 36%. The emissions of SO_2 mainly originate from stationary energy sources, such as thermal power plants and refineries. The use of low-sulphur fuels and other measures has led to a 61.5% decrease in sulphur emissions compared to 1990.

Ozone precursor emission



Emission (Gg)	1990	1995	2000	2001	2002
SO_2	188.8	79.6	32.8	71.5	74.6
NMVOC	495.1	267.6	236.6	198.2	314.7
CO	425	296.2	391.9	366.1	372.8
NO_x	91.8	68.3	86.5	88.1	93.1

Source: Ekonerg

AIR - CLIMATE

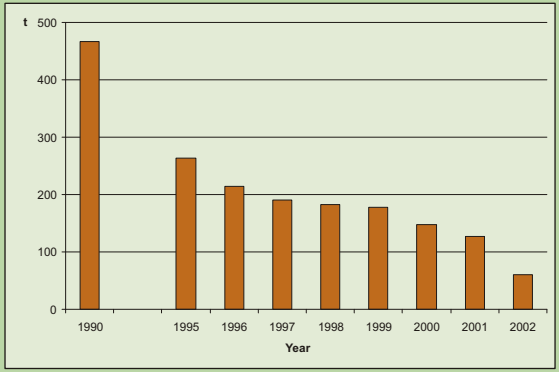
Lead Emission

Lead is a heavy metal, which due to its persistency, high toxicity and tendency for bio-accumulation, poses risks to flora, fauna, soil, water and public health. Lead may be transported by air over large distances.

Trend and Current State

About 93% of all lead emissions come from road traffic. Other sources of emissions are production processes other than those burning fuel (4%), and stationary energy sources (2%). In 2002, lead emissions were about 60 tonnes, which is 44% less than 2001, and 87% less than 1990. The reduction in emissions comes from the increasing use of unleaded petrol. Although traffic volumes have increased, technical improvements to vehicles and the use of unleaded petrol have resulted in a decreasing trend in lead emissions. In 2006, leaded petrol will be banned from the Croatian market, so lead emissions from road traffic will be reduced to a minimum.

Trend in lead emission in Croatia



Year	1990	1995	2000	2001	2002
Lead emission (t)	466	264	147	127	60

Source: Ekonerg

ENERGY

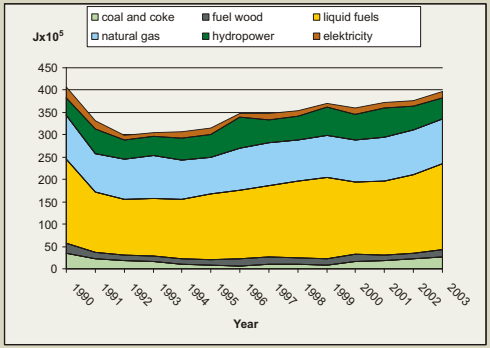
Total Energy Consumption

Energy consumption is a good indicator of a country's development. Higher development levels mean higher energy consumption rates. Depending on its form, energy can have higher or lower environmental impact. Cleaner forms of energy are natural gas, hydropower, etc.

Trend and Current State

Total energy consumption in Croatia has been on the increase since 1992. The increase in consumption has been recorded for all energy forms, except for hydropower. Unfavorable hydrological conditions, i.e. periods of drought, have caused lower generation of energy from hydropower, which is an ongoing trend. Consumption is dominated by liquid fuels, natural gas and hydropower, which account for 85.8% of total energy consumption. Total energy consumption per capita is 46.6% lower than in the European Union.

Total energy consumption



Year	1990	1995	2000	2001	2002	2003
Total energy consumption (Jx10^5)	407.51	314.08	359.62	371.58	376.44	395.93

Source: Hrvoje Pohar Energy Institute

ENERGY

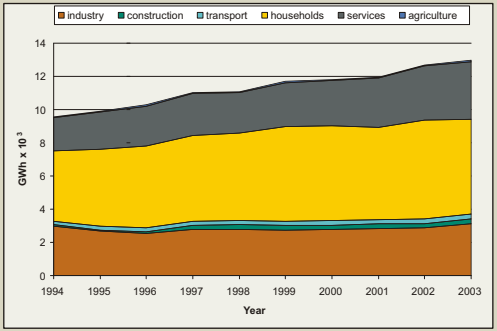
Electricity Use by Sectors

Electricity is one of the most widely used forms of energy. It is generated from crude oil, coal, natural gas, hydropower and other primary energy sources.

Trend and Current State

In 2003 the total consumption of electricity was 24.3% higher than in 1994. The highest consumption is by households, agriculture and service industries, accounting for 70% of the total in 2003. Electricity consumption in industry was decreasing until 1996, and a small increase has been recorded since. Gross electricity consumption per capita is 47.9% lower than in the European Union.

Electricity consumption by sectors



Year	1994	1996	1998	2000	2002	2003
Total consumption of electricity (GWh)	9,583	10,284	11,084	11,806	12,691	12,961

Source: Hrvoje Požar Energy Institute

WATER

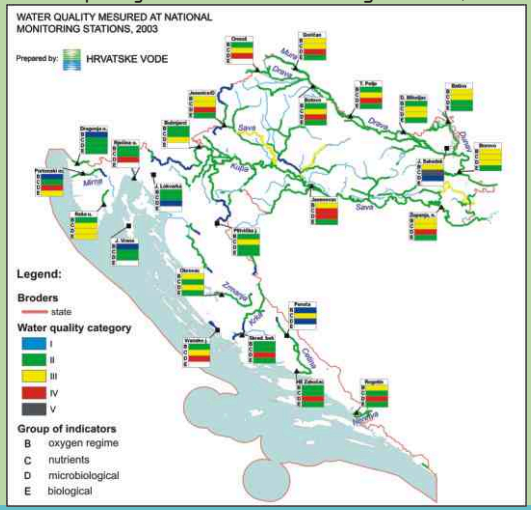
Surface Water Quality

Discharge of different pollutants via wastewater, leachate from agricultural land, the atmosphere etc. causes water quality change. Water quality classification scheme consists of five classes, I the best (marked blue) and V the worst (marked black). The water quality classification is based on the oxygen regime, nutrients, and microbiological and biological indicators.

Trend and Current State

There was no significant change in the quality of rivers, lakes and reservoirs in 2003 compared to the previous years. However, some of the targets for improvements to water quality were not met. Water quality degradation is most frequently caused by the discharge of wastewater. Water quality assessment based on biological indicators shows minimum degradation compared to the previous years, which is good because these indicators are believed to indicate the long-term status of water quality, and they give a comprehensive picture of the ecological condition.

Water quality measured at monitoring stations, 2003



Source: Hrvatske vode

WATER

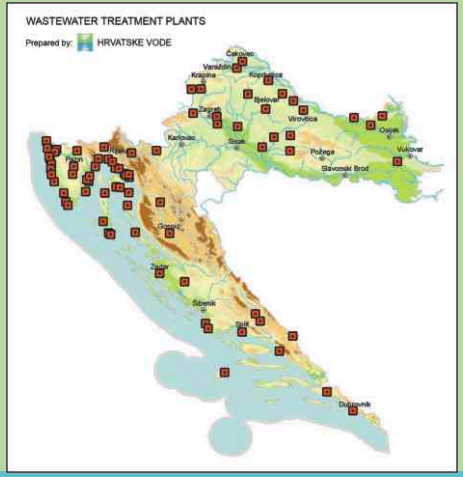
Municipal Wastewater Treatment

The discharge of untreated or inadequately treated wastewater into streams, rivers and the sea causes degradation of water quality, which has a negative impact on biodiversity of riverine and marine ecosystems and diminishes the quality of water used for different purposes (drinking, bathing, recreation, irrigation, etc.).

Trend and Current State

Out of the 290 settlements served by sewerage systems, 107 are connected to wastewater treatment facilities. Altogether, 82 plants have been built with different degrees of wastewater treatment and capacity. Out of the total number of plants, 22 perform a pre-treatment stage, 26 perform a primary treatment stage, and 34 plants perform secondary treatment stage. No facility with tertiary wastewater treatment has yet been built. The wastewater treatment plants are distributed as follows: 42 plants in the catchments of Primorje and Istria regions, 20 in the Sava River catchment, 11 in the Dalmatian catchment, and 9 in the Drava and Danube catchments. In Croatia, only 25% of municipal wastewater is treated: 6% by pre-treatment, 76% by primary treatment, and 18% by secondary treatment stage (4.4% of total household wastewater quantity).

Distribution of the municipal wastewater treatment plants



Source: Hrvatske vode

SEA AND COASTAL AREA

Hot Spots

Certain partially confined areas in the coastal zone, highly burdened with wastewater of urban and/or industrial origin, riverine inputs or traffic in ports are classified as hot spots.

Trend Current State

Between 1998 and 2003, the Pula Bay, deep sections inside the Limski Channel, the Rijeka and Bakar Bays, the city port of Zadar, the Šibenik Bay and part of the Kašela Bay (the Vranjica Basin) had the worst ecological situation. These areas were classified as hot spots based on the monitoring of a set of parameters indicating permanent/occasional changes in natural trophic status. They are subject to a higher degree of eutrophication, and an increase in concentrations of nutrient salts and harmful substances (heavy metals, chlorinated hydrocarbons, DDT, PCB) found in sea water, sediment and organisms which exceeded the natural or legally stipulated levels.

Hot spots in Croatian part of Adriatic

Source: IOF, RBI, CMR

SEA AND COASTAL AREA

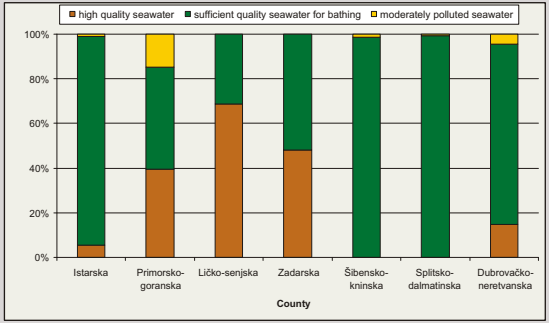
Bathing Seawater Quality at Beaches

Quality of seawater at beaches is monitored to protect public health during the swimming season, from 15 May to 30 September. To determine sea quality, bacteriological indicators are used.

Trend and Current State

Sea water quality is very high in Croatia. In 2000, more than 96% of seawater samples from surveyed beaches met the standards. In 2003, the percentage reached almost 98%, and the same percentage was recorded in 2004. So the improvement in quality of seawater seems to be a permanent trend. In 2004, the largest number of beaches with high-quality seawater was in Ličko-Senjska County (68.89%), than Zadarska County (47.95%), Primorsko-Goranska (39.4%), Dubrovačko-Neretvanska (13.79%) and Istarska (5.42%) counties.

Bathing seawater quality at beaches, 2004



Total number of beaches	Percentage of beaches by the seawater quality			
	High-quality seawater	Seawater adequate (sufficient quality) for bathing	Moderately polluted seawater	Highly polluted seawater
846	21.39	73.64	4.96	0

Source: MEPPPC

FISHERIES AND MARICULTURE

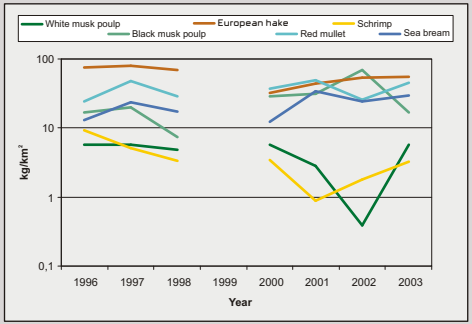
Biomass Index for Economically Important Species

Biomass, an assessed quantity of organisms in a given area (e.g. the total mass of individuals within the same species) indicates productivity of that area. The biomass index indicates the trends in stocks of specific species.

Trend and Current State

The biomass index for demersal species of maritime organisms in Croatia was decreasing until 2000, and then started to increase. The European hake biomass index was decreasing until 2000, but the situation stabilized and improved between 2000 and 2003. Red mullet, sea bream, and musk poulp show significant annual fluctuations, but no negative trend of the biomass index values was noticed. The least favorable biomass index is that for shrimps, with a highly negative trend until 2001, and a subsequent small improvement. This situation is a consequence of intensive fishing activities and changes in hydrographical conditions that play an important role in reproduction and survival of organisms in their early life stages.

Biomass index for economically important species (in Croatian part of Adriatic)



Species	1996	1997	1998	2000	2001	2002	2003
Sea bream	13.01	23.48	17.07	12.27	34.45	24.06	29.33
Schrimp	9.28	5.10	3.39	3.45	0.88	1.81	2.25
Red mullet	24.13	48.07	29.05	37.63	48.69	25.83	44.81
European hake	76.28	80.01	69.68	32.67	43.77	54.14	54.79
Black musk poulp	16.68	19.69	7.40	28.80	30.97	70.11	17.02
White musk poulp	5.75	5.66	4.83	5.70	2.80	0.38	5.76

Source: IOF

FISHERIES AND MARICULTURE

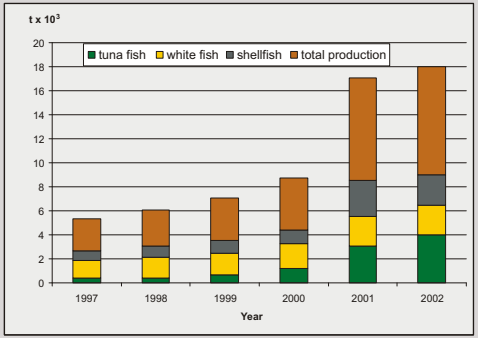
Mariculture Production

The introduction of large quantities of metabolic products and uneaten food in a confined space makes fish farms large sources of nutrients. This causes increased eutrophication, phytoplankton bloom, and subsequently, changes in composition of benthic organisms.

Trend and Current State

Mariculture production, particularly the production of tuna fish, has significantly increased over the recent years. Production of white fish is based on breeding high-quality species, such as sea bass, gilthead and sheepshead bream. Due to the development of the tourist industry and the subsequent increase in fish demand during the last years, a moderate but steady increase in production of these species has occurred. In total, production of bass accounted for about 70%, gilthead for 29%, and the rest were sheepshead bream and other species. Croatia produces about five million bass and gilthead fry a year. The shellfish industry mainly produces mussels and oysters. Oysters are mainly grown in Malostonski Bay, and the production is decreasing because of insufficient fry quantities.

Mariculture production by species



Year	1997	1998	1999	2000	2001	2002
Total mariculture production (t)	2,680	3,047	3,540	4,378	8,545	9,000

Source: MAFWM

WASTE

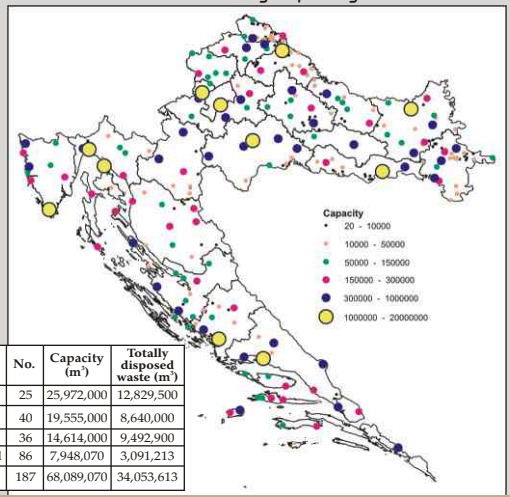
Landfills: Number and Capacity

Leachate from landfills may contaminate water and soil, and landfill gas emission may affect air quality. Landfills often visually pollute the landscape, they occupy useful land areas and are frequently sources of odour emissions.

Trend and Current State

Altogether 187 landfills have the necessary permits or operate on basis of some other documentation or approvals issued by city/municipality. The number of illegal dumpsites is very large, but it has never been exactly determined. Numerous landfills are not economically viable and do not meet the stipulated standards. Equipment and protective measures applied at the landfills are inadequate, and only a minority of landfill operators regularly monitor their impact on the environment (water, air, soil). About 50% of the total landfill capacity (68 million cu.m) is in use. About 60 large landfills (servicing 72% of the population) received 85% of the total disposed waste. Most of the waste is landfilled at Prudinec (Zagreb), Karepovac (Split) and Viševac (Rijeka).

Landfills by capacity



Landfill category	No.	Capacity (m^3)	Totally disposed waste (m^3)
Licensed	25	25,972,000	12,829,500
In licensing procedure	40	19,555,000	8,640,000
Official	36	14,614,000	9,492,900
Authorised	86	7,948,070	3,091,213
Totally	187	68,089,070	34,053,613

Source: CEA

WASTE

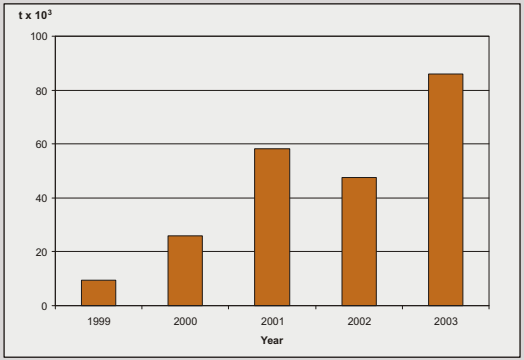
Hazardous Waste Generation

Hazardous waste usually accounts for only 1% of the total waste quantity. However, unless adequately disposed of, it may pose high risk to the environment and to public health because of its harmful characteristics.

Trend and Current State

According to assessments, annual production of hazardous waste is about 200,000 tonnes, although the reported quantities are much lower. The official data from the National Emission Inventory System (NEIS) show an increase in hazardous waste production, which is probably due to improved reporting practices. The major hazardous waste producer are processing industries, where the largest amounts of reported waste include waste oil, petroleum-processing waste, and inorganic waste from thermal processes. Large quantities of such waste are temporarily stored at manufacturers sites and in treatment facilities (25,333 tonnes in 2003). In 2003, the treatment facilities accepted 21,072 tonnes, and export licenses were approved for 22,950 tonnes of hazardous waste. Since no adequate disposal facilities are available in Croatia, the quantities of hazardous waste exported are on the increase.

Quantity of generated hazardous waste



Year	1999	2000	2001	2002	2003
Waste quantity (t)	9,422	25,999	58,285	47,443	86,113

Source: CEA

SOIL AND AGRICULTURE

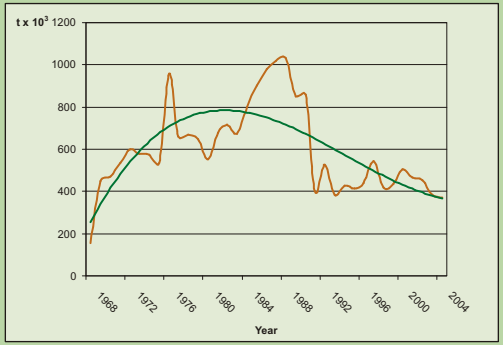
Consumption of Mineral Fertilisers

The application of mineral fertilisers enables the production of larger quantities of food. But it also can have an adverse effect on the environment by causing soil and groundwater contamination, air emissions, and surface water eutrophication.

Trend and Current State

Today, the consumption of mineral fertilisers in Croatia amounts to 500,000 tonnes, which is half the amount consumed in the late eighties. Fertiliser consumption per agricultural land unit is about 158 kg/ha, and per arable land unit 251 kg/ha. These rather small quantities vary considerably between regions. The overall consumption of mineral fertilisers was decreasing between 1968 and 2004. Figures show a further reduction in recent years. However, it should be noted that crop growing without fertilisation may deplete agricultural land, which, in the longer term, can not be accepted.

Consumption of mineral fertilisers



Year	1970	1980	1990	2000	2002	2003	2004
Consumption of mineral fertilisers (t)	470,000	553,000	858,576	504,742	453,733	385,539	371,273

Source: CEA, Faculty of Agriculture, University of Zagreb

SOIL AND AGRICULTURE

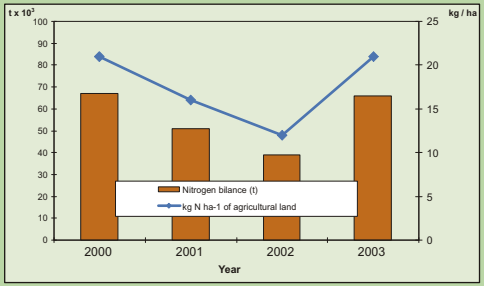
Nutrient Balance

Excessive levels of nutrients, which are not used by plants, are potential sources of water and air emissions. A well balanced level of nitrogen and phosphorus substances is needed in order to avoid harmful impacts on the environment.

Trend and Current State

The total nitrogen balance in agricultural soils depends on several factors. In dry years, when crops can not take up enough nutrients excessive nitrogen levels in soils can be observed. During the period 2000-2003, the nitrogen balance was positive (input higher than use), ranging between 39,000 and 67,000 tonnes a year. The excessive nitrogen level per agricultural land unit decreased from 21 to 12 kg/ha between 2000 and 2002, but increased again to 21 kg/ha in 2003.

Nitrogen balance in agricultural soils and excess of nitrogen per hectare



Year	Nitrogen bilance (t)	kg N ha-1 of agricultural land
2000	67,063	21
2001	50,876	16
2002	38,804	12
2003	66,001	21

Source: CEA, Faculty of Agriculture, University of Zagreb

SOIL AND AGRICULTURE

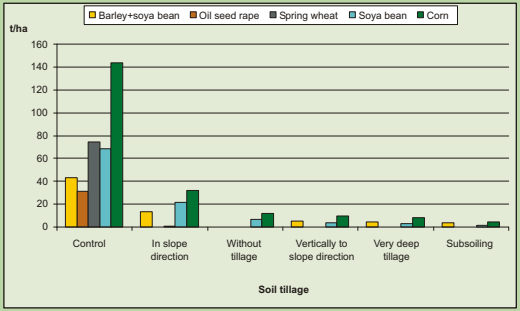
Agricultural Soil Erosion

Erosion causes loss of arable land, a decrease in soil quality and maybe permanent loss of soils through its removal.The two main reasons for soil erosion are inadequate management of agricultural land particularly caused by unacceptable tillage practice and crop rotation.

Trend and Current State

Actual soil erosion risks in the agro climate were studied in central Croatia, on hill slope pseudogley soil, which is one of the most frequently encountered soil types in Croatia and in Central Europe. According to the results obtained, the common practice of downhill tillage should be abandoned. In addition to this, plot fragmentation and an increasing share of spring crops (e.g. spring wheat, barley, rye) sawn in low densities on hillsides soils may cause additional problems in future such as water erosion.

Soil erosion by water



Soil tillage	Control	In slope direction	Without tillage	Vertically to slope direction	Very deep tillage	Subsoiling
Barley+soya bean	43.02	13.59	0.32	5.29	4.32	3.37
Oil seed rape	31.03	0.27	0.17	0.075	0.086	0.041
Spring wheat	74.7	0.5	0.1	0.1	0.2	0.1
Soya bean	68.5	21.6	6.8	3.7	2.7	1.5
Corn	143.9	32.3	11.7	10	8.3	4.5

Source: CEA, Faculty of Agriculture, University of Zagreb

BIOLOGICAL DIVERSITY

Threatened Plants and Animals by Taxonomic Group

Population density and the distribution of flora and fauna in a specific area are used to indicate changes in the number of plant and animal communities and the biological diversity as a whole.

Trend and Current State

A reduction in population density by more than 50% over a period of 10 years (or within three generations), and a reduction of distribution area estimated to about 5,000 km^2, are the IUCN criteria for a species to be proclaimed threatened. These criteria are applied worldwide. The Croatian Red List includes 1,171 plant and animal species, of which 395 are endangered, while others either belong to lower risk categories or are insufficiently known and studied. It has been estimated that already six species of fresh water fish, four species of mammals, ten species of higher plants, thirteen bird species and one reptile species have become extinct in Croatia. Compared to other European countries, Croatia's index of biodiversity is high and it should be preserved by taking adequate measures.

Endangered plants and animals by taxonomic group

Taxonomic group	Number of species	CR+	EN	VU	Number of threatened species	% threatened species
Mammals	101	-	5	3	8	*7.9*
Birds	231	30	33	16	76	*32.9*
Reptiles	38	2	2	-	142	*10.5*
Amphibians	20	1	1	2	4	*20.0*
Freshwater fishes	145	12	22	32	66	*45.5*
Higher plants	5,360	90	62	71	223	*4.2*
Butterflies	180	5	2	4	11	*6.1*
Total	6,075	140	127	128	392	6.5

IUCN risk categories:
*CR-**critically endangered,** extremely high risk of extinction*
*EN-**endangered,** very high risk of extinction*
*VU-**vulnerable,** high risk of extinction*

Source: State Directorate for Nature Protection

BIOLOGICAL DIVERSITY

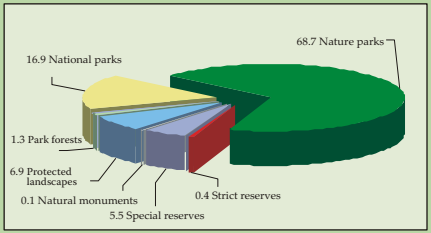
Protected Areas

Protected areas are custodians of biological and landscape diversity, and cultural heritage. Protection of such areas contributes to preservation of rare and endangered species and habitats.

Trend and Current State

Croatia has designated an area of about 5,888 km^2, which includes main land and sea area. This accounts for about 6.7% of the total territory that is to be protected by different categories. The number of protected areas has been on the increase since 1991. The highest protection categories are national parks and parks of nature, where activities that could harm the environment are forbidden. Nature conservation objectives can be particular plant and animal species, phytocenoses and zoocenoses, different habitats, and the aquatic, maritime and geological phenomena within a specific area. The national parks occupy only 1.3% of the inland territory. The Croatian Government designates the national and parks of nature. All the other areas to be protected are designated by the counties and the City of Zagreb directly.

Shares of protection categories



Protection category	Number of localities	Area (km^2)
National parks	8	994
Nature parks	10	4,046
Strict reserves	2	24
Special reserves	79	325
Natural monuments	31	6
Protected landscapes	68	405
Park forests	91	79
Horticultural monuments	138	9
Totally	**427**	**5,888**

Source: MEPPPC

FORESTRY

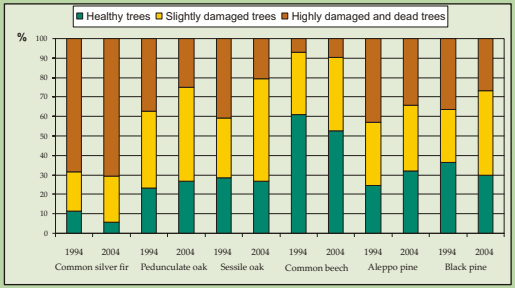
Damage to Forests

Damage to tree species indicates that forest biocenosis is disturbed by air pollution, precipitation of harmful substances and/or changes in groundwater tables. According to the degree of degradation, trees are classified as healthy (damage degree to 10%), as slightly damaged (damage degree 10-25%) as highly damaged or as dead trees (damage degree over 25%). The damage degree is determined on the basis of changes of leaf and needle colour and of the defoliation level.

Trend and Current State

According to the results of the International Co-operative Programme of Air Pollution Effects on Forest - ICP Forest, used for monitoring of degradation parameters, the degradation of the Croatian forests is much higher than the European average, due to air pollution caused by acid rain. The situation is very serious with the common silver fir, particularly in the regions of Gorski Kotar and Mt. Velebit. A negative trend in the degradation of other most common tree species has also been observed. The changes in groundwater table have endangered common ash and penduculate oak forests, which are regarded as the most valuable lowland flood forests along the Sava, Drava, Danube and Mura rivers.

Damage of some of the most common tree species



Tree species	Share of trees according to the degree of degradation (%)		
	Healthy trees	Slightly damaged trees	Highly damaged and dead trees
Common silver fir	5.6	23.7	70.7
Pedunculate oak	26.8	48.3	25
Sessile oak	26.9	52.3	20.8
Common beech	52.7	37.8	9.5
Aleppo pine	31.8	34.1	34.1
Black pine	29.9	43.3	26.8

Source: Faculty of Forestry, University of Zagreb

FORESTRY

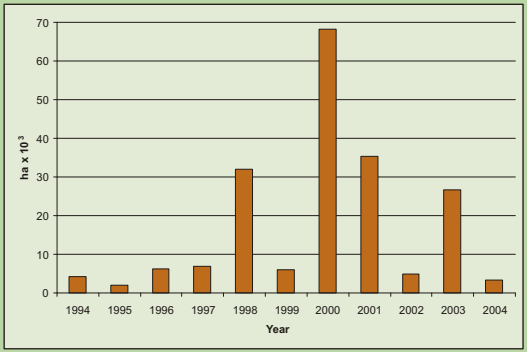
Fire-Affected Areas

Fires cause numerous ecological changes: loss of habitats, loss of arable land, extra risk for erosion and landslide, and groundwater contamination due to losses of topsoil.

Trend and Current State

During the period 1994-2004, about 195,860 ha of land were burnt by fires, of which 95% was in coastal and island areas. The increasing number and size of areas affected by forest fires is correlated with the cultivated areas decline. Agricultural and forest areas planted with native species have shown higher stability and resistance to fire. The fire-affected areas also diminish the visual value of the landscape, which is important for tourism. Seawater used for fire fighting may damage the vegetation. It also disturbs the concentration levels of micro and macro elements in soils and, it makes any regeneration of a fire-affected area a time consuming and expensive process.

Fire-affected areas



Year	1994	1996	1998	2000	2002	2004
Fire affected areas (ha)	4,243	6,149	32,055	68,166	4,846	3,379

Source: FAO

ENVIRONMENT IN YOUR POCKET

Acronyms And Abbreviations

CEA - Croatian Environment Agency

CH_4 - methane

CO - carbon monoxide

CO_2 - carbon dioxide

DDT - dichlorodiphenyltrichloroethane (chlorinated hydrocarbons)

FAO - Food and Agriculture Organisation

Gg - Giga-gram; 1 Gg = 1000 tonnes

HFC, PFC - halogenated hydrocarbons

ICP - International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests

IOF - Institute of Oceanography and Fisheries, Split

IUCN - International Union for Conservation of Nature

MAFWM - Ministry of Agriculture, Forestry, and Water Management

MEPPPC - Ministry of Environmental Protection, Physical Planning, and Construction

NMVOC - Non-Methan Volatile Organic Compounds

NO_x - nitrogen oxides

N_2O - nitrous oxide

OECD - Organisation for Economic Co-operation and Development

PCB - polychlorinated biphenyls

RBI, CMR - Ruđer Bošković Institute, Center for Marine Research, Rovinj

SF_6 - sulphur hexafluoride

SO_2 - sulphur dioxide

Glossary

benthos - Organisms living on, feeding from and occupying the bottom of aquatic ecosystems.

biocenosis - Association of living organisms (flora, fauna, microorganisms), which occupy the same area (habitat).

biological diversity - Overall diversity of life on Earth, which encompasses genetic (variation within species), species, and ecosystem diversity.

biological indicators (bioindicators) of water quality - Aquatic organisms, which are most sensitive to changes in the environment. Their absence or presence in the environment indicates what the degree of pollution is.

biomass (biomass index) - Quantitative assessment of organisms within an area, i.e. total mass of individuals within a particular species, population, taxonomic group of organisms or biocenosis per unit of surface area of per volume of a habitat.

crude oil - Mineral oil of natural origin composed principally of hydrocarbons mixed with impurities, e.g. sulphur.

ecological factors - The factors influencing the ecosystem state, processes and changes, grouped into abiotic factors (temperature, oxygen, carbon dioxide, light, nutrients, climate, etc.) and biotic factors (factors related to life processes and relations between organisms).

ecosystem - Basic functional unit in nature in which living communities (microbiocenoses, zoocenoses, and phytocenoses) interact with their non-living environment.

emission - Liquid, gaseous or solid substances discharged or leaked from a source into the environment.

eutrophication - Excessive production of organic matter (biomass of the producers) in aquatic and terrestrial ecosystems due to ecosystem loading with nutrients (typical symptom of eutrophication in sea is algal bloom i.e. intensive growth of phytoplankton, etc.)

halogenated hydrocarbons - Compounds that due to their stability, persistency and accumulation in the environment impact the living world, and consequently public health.

Glossary

hypoxy - Drop in oxygen concentration in water column below 2 mg/l.

indicator - Numerical value representative of one or more different measurements; an efficient tool for the environmental change monitoring and implementation of sector policies and strategies; helps understanding of complex environmental problems and presents a quantified information in a simple and clear manner.

indigenous (native) species - Species that occur naturally in habitats they occupy.

landfills

illegal landfills (dumpsites) - disposal sites not included in planning documents, without necessary operating licenses or approvals of competent local authorities;

authorised landfills - waste disposal sites generally not included in planning documents, environmental impact assessment procedure has not been carried out, without operating licenses, merely acknowledged by local authorities or operating in agreement with them, and generally not included in official waste collection and transport by municipal utilities;

official landfills - waste disposal sites generally included in planning documents, environmental impact assessment procedure usually has not been carried out, without any licenses, operating on the basis of a decision or approval of local authorities;

landfills in licensing procedure - waste disposal sites included in planning documents; licence approval procedure pending;

licensed landfills - waste disposal sites operating with approval of local authorities based on conducted environmental impact assessment procedure and granted site, building and operating permits.

microbiocenosis - Association of microorganisms which structure, composition and size are influenced by numerous environmental factors.

Glossary

microbiological indicators of water quality - Groups of bacteria (particularly coliform bacteria indicating faecal contamination of water), whose total count is determined in water sample.

natural gas - Mixture of gases (mainly methane) occurring in natural underground beds in liquid or gaseous form.

NEIS - National Emission Inventory System - A database containing data on air and water emission, and data on generated, collected, and treated quantities and kinds of waste.

nutrients - Mineral salts, primarily salts of nitrogen and phosphorus, which significantly influence growth and development of primary producers (plants, including phytoplankton) and when in excessive quantities cause the uncontrolled plant growth.

oxygen regime - Set of indicators defining the oxygen dissolved in water column. Abundance or lack of oxygen in water considerably impact distribution of fresh-water and marine organisms.

phytocenosis - Association of plants which structure, composition and size are influenced by numerous environmental factors.

phytoplankton - Microscopic organisms that live in water column and float in it carried by currents and waves.

primary production - Production of organic matter (biomass of the producers).

renewable energy sources - Energy sources not depleted in energy production, including hydropower, solar energy, wind energy.

stock - In terminology used in fisheries, stock includes individuals of the same species occupying a particular area (with common genetic material) which almost do not mix with individuals from other areas.

trophic status - Eutrophication degree. It may be oligotrophic (low productivity, high transparency, absence of hypoxy), mesotrophic (moderate productivity, occasionally diminished transparency, occasional hypoxy) or eutrophic (high

Glossary

productivity, low transparency, hypoxy)

wastewater treatment:

pre-treatment - procedure used for removal of bulk dispersed and floating matter from wastewater;

primary treatment - physical and/or chemical procedures for wastewater treatment in which minimum 50% of suspended matter is removed;

secondary treatment - biological and/or other procedures for wastewater treatment in which suspended matter concentration is further reduced;

tertiary treatment - physico-chemical, biological and other procedures for reduction of nutrient concentration in wastewater by minimum 80%, and removal of other specific waste matter indicators to the limit values that cannot be achieved in the secondary treatment.

wastewater treatment plants - Plants where residential and industrial wastewater is treated before discharging in natural recipients.

water quality - Determined on the basis of the following indicators stipulated by law: oxygen regime, concentration of nutrients (primarily mineral salts of nitrogen and phosphorus), microbiological and biological indicators.

zoocenosis - Association of animals which structure, composition and size are influenced by numerous environmental factors.

CROATIAN
ENVIRONMENT AGENCY