The environment is a part of us.
A time of challenge

The Environmental Agency of the Republic of Slovenia is the leading environmental institution in the country, performing expert, analytical and administrative tasks in the field of the environment at the national level.

A part of its mission is to monitor environmental pollution and provide quality public information on the environment. For this purpose it has at its disposal a suitable measuring network and laboratories. A very important part of the Agency’s mission is to fulfil the environmental protection requirements arising from applicable regulations, to conserve natural resources and biodiversity, and to ensure that Slovenia develops in a sustainable manner. To this end the Agency carries out about 260 administrative procedures deriving from national and transposed EU legislation concerning the environment.

The Agency took an integrated approach to solving climate change issues. One of the causes of climate changes is excessive greenhouse gas emitted into the atmosphere. The Agency monitors these emissions, records them and contributes to their reduction through relevant systemic measures. It develops expert groundwork on how to adjust to environmental changes and mitigate their negative effects.

The Agency was established in 2001 as a body within the Ministry of the Environment and Spatial Planning. It is a young institution in years, but one with strong expert capabilities. It employs 434 people with different professional profiles. Most of them have a university degree, 38 have a master’s degree and 19 a doctorate. Such potential is essential for finding comprehensive, expert and coordinated solutions offered by the interconnected and technological global society.

A time of challenge, of anthropogenic and natural climate change, of the effort to ensure sustainable development of the environment. This complex and systematic process affects life on Earth; our existence and evolution; hence the scientific findings and expert groundwork are of key importance and will serve as a basis for political decisions.

The Agency devotes special attention to the raising of public awareness on the environment and environmental issues. When properly informed, the public can contribute a great deal to environmental protection. The quality of the Agency’s services is, as a consequence, very important. The Agency has obtained a quality management system certificate under the ISO 9001:2000 standard and accreditation certificates for its Calibration and Chemical Analysis Laboratories.

It is a public agency, and its success and reputation depend on effective communication with the general public. Thus it continually strives to improve its public relations. This presentation booklet “The Environment Is a Part of Us. We Are a Part of the Environment.” is just one element in the mosaic of efforts to present environmental issues to citizens, whose environment and health the Agency protects.

Dr. SILVO ÆLEBIR
DIRECTOR-GENERAL
Content

5  The environment under a watchful eye
41  We protect, we conserve, we act
        Environmental protection and administrative procedures

17  The false sense of superiority over nature is deceptive
41  The search for a perfect balance

20  Its simplicity is full of secrets
41  In nature, too, everything is related

29  The environment is conserved through awareness
41  Important years and events

88  International cooperation

113  Water management

116  In nature, too, everything is related

119  Natural phenomena and processes in the environment

121  Climate change

124  The environment under a watchful eye

127  State of the environment
The environment under a watchful eye

Measurements and analyses direct our path.

Water quality

With regard to water resources Slovenia is among the richest of European countries. In Slovenia water covers about 272 km² and in geological units capable of conducting and accumulating groundwater there is about 50 m³/s of dynamic supply. The programme of national water quality monitoring includes the monitoring and assessment of the quality of surface watercourses, underground waters (groundwater and springs), lakes and the sea. It also covers protected areas designated for abstraction of drinking water, areas important for freshwater fish, areas important for marine bivalves and gastropods, and bathing areas.

Programmes are drawn up in accordance with national regulations, which transpose EU directives concerning water management, and are based on the analysis of the status or pollution of particular water bodies. There are more than 120 measuring points for underground water and more than 220 for surface water. On the basis of gathered data the Agency makes evaluations of the status of surface and underground water, which then form a foundation for the development of measures at the national level. Data collected by water quality monitoring are available to the public in the form of annual reports. Poor water quality is mostly due to various discharges of industrial and urban wastewaters, as well as diffuse pollution from agriculture, the latter threatening mostly the quality of underground water. The Agency collects and analyses data on the location, type and quantity of substances discharged from industrial, urban and combined wastewater treatment plants. The processed data and derived units of burden indicate the impact of point sources, i.e. industrial polluters, on water quality status and are at the same time a basis for levying environmental taxes. Of course, they also allow the pollution to be controlled.
Soil quality

The pollution of underground waters, which are the main source of drinking water in Slovenia, can be prevented by controlling the quality of the soil, where pollutants remain until they leach into the water below ground. In accordance with the National Environmental Action Programme, the Agency is carrying out soil pollution monitoring and a soil information system. The collected data will be a basis for setting up the first assessment of soil pollution, which foresees the collection of data on soil pollution at sample sites based on an 8 x 8 km grid.

Air quality

Ambient air quality in Slovenia is most affected by atmospheric emissions in the country itself, although transboundary pollution also plays a part. Other factors contribute to higher concentrations of substances in the ambient air and the spread of pollution: meteorological phenomena, physical and chemical processes of substances transformation and topography. Owing to rugged terrain, temperature inversions are common in the wintertime in Slovenia. Owing to rugged terrain, temperature inversions are common in the wintertime in Slovenia. Under such circumstances vertical circulation is impossible and emitted substances do not disperse and are not diluted, but rather accumulate in depressions, valleys and lowlands, where there are the greatest number of populated settlements. In the summertime high temperatures and higher solar radiation contribute to intensive photochemical reactions, causing the formation of ground-level ozone. Long-range transmission of air pollutants is also important. At this latitude west winds prevail in the troposphere, but in Slovenia, owing to the Alps, the wind in lower layers turns, thus bringing polluted air into Slovenia mostly from west-southwest. In the summer this is manifested in higher ground-level ozone concentrations, especially in the coastal region. The other prevailing direction is the north-eastern, which usually does not bring air masses from which air masses flow at ground level is coastal. In the summertime high temperatures and higher solar radiation contribute to intensive photochemical reactions, causing the formation of ground-level ozone. Long-range transmission of air pollutants is also important. At this latitude west winds prevail in the troposphere, but in Slovenia, owing to the Alps, the wind in lower layers turns, thus bringing polluted air into Slovenia mostly from west-southwest. In the summer this is manifested in higher ground-level ozone concentrations, especially in the coastal region. The other prevailing direction is the north-eastern, which usually does not bring air masses from which air masses flow at ground level is coastal.

Measurements of air quality in Slovenia are carried out through several measuring networks:

- An automatic measuring network with 9 measuring points in settled areas - data are collected every half hour. The stations measure concentrations of sulphur dioxide, nitrogen oxides, carbon monoxide, ozone, particulates, BTEX organic compounds (benzene, toluene, xylene) and heavy metals.
- A background air pollution measuring network in areas distanced from large pollution sources with two stations, Iskrba and Krvavec, which are included in the international EMEP and GAW networks. At the Iskrba station, in addition to half-hour automatic measurements, daily samples are taken for the determination of S- and N-compounds and chloride, calcium, magnesium, sodium and potassium ions.
- A precipitation quality measuring network (5 measuring points) - measuring pH, electrical conductivity and ions: SO4^2-, NO3^-, Cl, NH4^+, Na^+, K^+, Ca^2+, Mg^2+. Samples are taken daily and weekly.

On the basis of measurements, emissions data and calculations with dispersion models, an evaluation of air pollution in Slovenia is made. Most frequently exceeded are the ozone limit values all over Slovenia. Primorska being the most threatened region, primarily due to ozone transmission from the Po Valley. Concentrations of sulphur dioxide exceed limit values and occasionally alert thresholds in the vicinity of thermal power plants. Annual limit values for particulates are exceeded in the majority of larger towns and the same applies to nitrogen dioxide near busy roads. Concentrations of carbon monoxide are much lower than permitted and benzene concentrations only come close to limit values near the busiest urban roads.

- In 2005 the Agency started taking indicative measurements of nitrogen dioxide, sulphur dioxide, ozone and benzene with diffuse samplers. These periodic measurements cover all major towns in Slovenia.
- A precipitation quality measuring network (5 measuring points) - measuring pH, electrical conductivity and ions: SO4^2-, NO3^-, Cl, NH4^+, Na^+, K^+, Ca^2+, Mg^2+. Samples are taken daily and weekly.

In addition to the above, the Agency receives data from auxiliary networks monitoring air quality in municipalities and at thermal power plants (TPPs in Šoštanj, Rogatec and Kranj, the Urban Municipalities of Ljubljana, Maribor and Celje, and IV ko. Municipality).
Chemical Analysis Laboratory

The laboratory has the expert and equipment capabilities to analyse basic physical and chemical parameters and certain inorganic and organic pollutants in samples from the environment (water, precipitation, air). It also carries out sampling of surface waters for further analysis.

The laboratory is accredited in accordance with the SIST EN ISO/IEC 17025 standard. It operates at the national level and participates in international monitoring:

- monitoring of the quality of the Danube River and tributaries related to the Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes and the Convention on Cooperation for the Protection and Sustainable Use of the Danube River;
- surface waters quality monitoring in cooperation with Croatia;
- air quality monitoring under the EMEP programme related to the Convention on Long-Range Transboundary Air Pollution; and
- air quality monitoring under the GAW programme of the World Meteorological Organisation.

Calibration Laboratory

The Calibration Laboratory is a national reference laboratory intended for the calibration of measuring instruments for the meteorological, hydrological and ecological measuring networks of the Agency and at Slovenian international airports. The laboratory is equipped in particular for the calibration of instruments for measuring temperature, atmospheric pressure, relative humidity, solar radiation and air quality parameters. The basic purpose of the laboratory is to provide quality measurement data, which are used for public information, for meteorological models, and for climate and ecological analysis; they are also useful for transport, agriculture and other industries. The laboratory is accredited in accordance with the SIST EN ISO/IEC 17025 standard. The accreditation is of fundamental importance for quality environmental monitoring.
Environmental status is the result of many pressures, mostly due to human activity. Usually this activity is manifested in emissions of substances and energy into the environment (water, air, soil) and waste.

Active care of the environment and improvement of its status must be integrated into spatial planning and any other planning of activities affecting the environment. In order to reduce adverse environmental impact, various economic instruments have been introduced, such as an environmental tax based on the “polluter pays” principle. A very important instrument for stimulating polluters to reduce pollution is the environmental tax exemption or reduction in the case of investment in environmental protection.

Decision-making through administrative procedures has been introduced to achieve an integrated and unified system for providing the control and planning of permitted emissions. Administrative procedures are carried out in compliance with the Administrative Procedure Act. There are more than 200 types of procedures, in which more than 10,000 decisions and other acts are issued every year. Forms have been developed for most procedures to help clients and administrative officials. Data processing and decision issuing, especially records on issued decisions on basic matters, are computerised. In order to ensure accessibility to as many clients as possible, the forms, regulations and instructions are posted on the Internet.

Following the enforcement of the new Environmental Protection Act in 2004, two new large chapters were opened which affect the control and reduction of environmental emissions, and the phasing-out and substitution of hazardous substances, but most of all they are intended for promoting the development and use of technologies that prevent, eliminate or reduce environmental burdens. The first is the introduction of a special environmental permit for activities and installations that could cause large-scale environmental pollution (IPPC permits), and the second is trade in emission rights, which is one of the economic and financial instruments of environmental protection.

Environmental protection and administrative procedures
Environmental permits and consents

The granting of environmental permits to large polluters is based on the EU Integrated Pollution Prevention and Control Directive, the IPPC Directive for short. The purpose of the Directive is to achieve integrated prevention and control of pollution resulting from certain activities and a high level of protection of the environment as a whole. Slovenia has transposed this Directive into its legal order by the Environmental Protection Act and the Decree on activities and installations causing large-scale environmental pollution.

A permit is required for the construction and operation of all installations involved in the activities listed in the Decree. These are in particular energy industries, production and processing of metals, the chemical industry, waste management and other activities. One hundred and eighty-nine companies have notified existing and operating installations subject to environmental permits. They must acquire an environmental permit by October 31st, 2007 at the latest, otherwise they will no longer be allowed to operate. There are also companies that are still planning to carry out activities subject to environmental permits. These companies must obtain the permit prior to the construction of the relevant installations.

Trade in greenhouse gas emissions

Trade in emission allowances has been introduced with a view to reducing environmental pollution in the most cost-effective way. An emission allowance covers a specified quantity of a substance a particular polluter may emit into the environment in a certain time period. Such an allowance is granted by the state in the manner and under the conditions laid down by the Environmental Protection Act and executive acts. For the time being, the only emission trade being enforced is the greenhouse gas emission allowance trade established by the EU to achieve the Kyoto Protocol targets. Trade in emission coupons is free, and all natural or legal persons may participate. For the smooth operation of the market and in order to monitor the trade, the state has set up an emission coupon registry which is maintained by the Agency. The registries of 14 EU Member States are electronically connected with the registry of the European Commission. The rules of their operation are laid down in a directly applicable EU regulation. The European market has been set up since January 1st, 2005 and the registries of individual Member States started to operate during that year. The Slovenian registry has been operational since the end of November 2005.

Nature conservation

The conservation of animal and plant species and their habitats and of valuable natural features and our landscape diversity is one of our fundamental responsibilities and one of the most important nature protection goals. Among the mechanisms for achieving this goal is the establishment of protected areas and special protection areas under Natura 2000. Natura 2000 areas cover 35.5% of Slovenia’s territory, of which 639,735 ha or 32% have been designated pursuant to the Habitats Directive (pSCI) and 461,819 ha or 23% pursuant to the Birds Directive (SPA).

Biodiversity conservation

In the field of animal and plant species conservation the Agency issues permits for activities affecting fauna and flora in the territory of Slovenia. It considers cases of damage caused by protected animal species and pays due compensation to injured parties. The Agency ensures the operation of a rescue centre for wild animal species and is the Management Authority for the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the related EU regulations. It issues relevant documents for the import and export of plants.
and animals. It organizes training seminars for enforcement authorities – customs, police and inspectors. It also maintains various records, such as information on the marking of captive animals of wild species, on issued permits for activities affecting the populations of protected animal and plant species, on damage caused by protected animal species, and on trade in endangered animal and plant species.

Protection of valuable natural features

The system for the protection of valuable natural features is based on the protection of aspects of nature that the society of a given time and place perceives as valuable, such as surface geomorphological, underground morphological, geological, hydrological, botanical, zoological, ecosystem, designed nature and landscape features. The total surface area of all 8096 valuable natural features, of which 3598 (44.4 %) are of national and 4498 (55.6 %) of local importance, is 2394.69 km² (11.52 % of the surface area of the state). Within the framework of valuable natural features protection, detailed protection guidelines for each type of natural feature are laid down. These guidelines are taken into account when giving nature protection consents or imposing nature protection conditions. Measures applying to valuable natural features are protection, temporary protection, contractual protection, stewardship and restoration.

Cave protection

We can say, without doubt, that Slovenia is a karstic country, not only for its large share of karst territory, but also for the impact that karstic phenomena have had on whole regions and their way of life. Among the most characteristic and frequent karstic phenomena are caves and shafts. There are 8523 known caves in Slovenia. Caves are a very important part of natural heritage for their geomorphological, geological, hydrological, zoological and botanical features. Because of the outstanding importance to nature protection, rapid degradation and specificity of protection, a special act regulating cave protection has been adopted. All caves are valuable natural features of national importance and public natural assets and are the property of the state. Protection and visiting regimes apply to all of them. The Agency issues permits and consents for the management of caves, and for visits, events and filming in caves in compliance with protection regimes.
The false sense of superiority over nature is deceptive

Understanding, respect and humility bring results.

Climate change

Climate conditions affect landscape appearance, flora and fauna, availability of water reserves, and determine the natural capacity of the environment to bear the burden of pollution and eliminate or degrade pollutants. Therefore, the work of the majority of Agency’s departments is directly and indirectly related to climate change. From days of old, climate has been a decisive factor in human settlement and lifestyle; throughout human history it has been reflected in the manner of construction, farming, choice and breed of domestic animals, density of settlements, human habits and cuisine. In the twentieth century, technological development provided an abundant supply of energy, enabled easy access to fossil fuels, brought different methods of construction, increased mobility and selection of culture plants and improved agricultural produce. With this rapid technological development it seemed as if we had subjugated nature. But in the last two decades scientists have collected firm evidence that human activities are changing the composition of the atmosphere. Greenhouse gas concentration has started to rise rapidly, mostly due to the use of fossil fuels. Greenhouse gases in the atmosphere are necessary for life on Earth since they provide suitable thermal conditions, but their rapid rise is changing the properties of the atmosphere and climate. Almost a third of all greenhouse gas emissions in Slovenia come from the production of electricity and heat. At this time it is almost impossible to significantly reduce emissions from this source. The situation is different in the transport sector, which is our second largest source, representing 19.5% of greenhouse gas emissions. Compared to the base year of 1986, emissions have doubled, which is mostly due to the increase in personal motorised transport. Other contributing emission sources have been fuel burning in households and commercial sector and waste. In 2003 emissions from agriculture were lower than in the base year, which is mostly the result of reduced livestock numbers. With the loss of the Yugoslav market, the phasing-out of non-viable production and increases in productivity, manufacturing industry contributed the most to the reduction of emissions. Emissions from fuel burning, as well as process emissions, were reduced.
Three climates converge in Slovenia – the Alpine, continental and Mediterranean – and owing to geographical characteristics the climatic conditions in depressions and valleys vary considerably. As a result, it is even harder to forecast how climate change will be reflected in different regions and locally. Measurements and calculations of average temperatures of Earth’s surface show that the atmosphere is warming. Temperature measurements in Slovenia show changes similar to those observed in Europe and throughout the world – average temperature is gradually rising and the rise has been most noticeable in the last twenty years. Of course, the warming of the atmosphere is not the only change; another cause for concern is also changes in air currents, in climate patterns and in the distribution and quantity of precipitation, and the frequency and intensity of extreme weather events. Glaciers are melting, winters without snow are more and more frequent, the sea level is rising, already dry areas are becoming even drier, and heavy rains are causing floods and mudslides. Plants react to warmer weather by prolonging their vegetative period and thus become more vulnerable to spring frosts. Damage caused by exceptional weather and climatic events is increasing rapidly, mostly owing to increasingly expensive infrastructure as we exploit land that our ancestors didn’t use because it was too exposed to the forces of nature.

That climate change is a serious problem is a view shared by politicians all over the world and by experts and laymen alike. Measures concerning climate change are divided among three areas:

- Monitoring of climate status and its impact on the environment as a whole. In this the Agency, with its meteorological, hydrological and ecological measuring networks, has a leading role in Slovenia. Measurements for monitoring changes in the environment must be particularly precise.
- It is very important that human activities do not affect the conditions in the vicinity of measuring points, where measurements must be carried out so that the instruments and measuring methods ensure comparable results over a long period of time.
- Efforts to monitor and reduce greenhouse gas emissions. By signing the UN Framework Convention on Climate Change (UNFCCC) Slovenia has joined the efforts to reduce human impact on the environment. And by signing the Kyoto Protocol it has committed itself to reducing its emissions in the first commitment period from 2008 to 2012 by 8% with regard to the base year of 1986. In order to achieve the set target, the Agency maintains a careful record of emissions and the number and type of their sources, following the guidelines and methodology issued in 1996 for the Convention Parties by the Intergovernmental Panel on Climate Change (IPCC). The guidelines are regularly updated and facilitate precision, transparency and comparability of emission inventories. Every year the Agency draws up a report on greenhouse gas emissions in accordance with that methodology.

Greenhouse gas emissions in 2003 amounted to 19,803 Gg CO₂ equiv, which is a little less than 2% below base year levels. CO₂, which mostly comes from fuel burning, accounts for the largest part of greenhouse gas emissions. In 2003 it represented as much as 81.3% of all greenhouse gas emissions. Following are methane (10%), N₂O (7.6%) and F-gases (1.1%).

In Slovenia forests cover more than 56% of the country’s surface area and present an important resource for the reduction of greenhouse gas emissions. Sink calculations due to changes in land use and forestry are substantial, according to the evaluation already made, at least 840 Gg CO₂ could be used in the 2008 - 2012 period, which will considerably facilitate the achievement of the Kyoto targets.
The search for a perfect balance

Prudence and wisdom lead us to harmony with nature.

Natural phenomena and processes in the environment

Meteorology

Weather directly or indirectly affects most human activity, so it has always required a lot of attention. The first measurements in the territory of Slovenia were carried out in the third decade of the nineteenth century, and there are uninterrupted weather data from 1850, when the meteorological station at Ljubljana Telegraph Office started its operation.

Measurements

The basis for weather forecasts and climate analysis is good-quality data, and the most important task of the national meteorological service is to carry out meteorological watch. Meteorological stations offer the most complete array of observations and measurements. Data from these stations are intended for forecasting, for real-time public information and for international exchange. On such a varied terrain as Slovenia’s, weather and climate conditions change noticeably over relatively short distances. Therefore, the measuring network for monitoring climate conditions is denser than usual. Part-time workers carry out measurements at these stations three times a day. There are about 40 such stations. Because the spatial variability of precipitation is great, there are also 180 stations where meteorological phenomena are observed and precipitation and snow depth measured once a day. Point measurements are not enough for the assessment of weather status; therefore, a radar centre is stationed on Ljubljana which transmits data on spatial distribution and intensity of precipitation. An additional data source is a satellite, transmitting images in different ranges of the electromagnetic spectrum, which supplies a lot of information on clouds, their height, type and movement. In Ljubljana, measurements of vertical temperature and humidity profiles are carried out; on the basis of the movement of a balloon-borne measuring device rising through the atmosphere, calculations are made of wind direction and speed throughout the atmospheric layers where weather is formed and even higher.
We tend to be acutely aware of the weather, when we are faced with exceptional or dangerous phenomena that could endanger our property, safety or even lives. Such phenomena are, for example, strong wind, hail, heavy rainfall and frost. When necessary, the national forecast service issues warnings about outstanding and dangerous weather events, but apart from this, it provides up-to-date weather forecasts for the current and next day and predictions for the following days for Slovenia and neighbouring regions. It also prepares data for special, more specific users. In addition to observation stations at airports, there is a special weather service for aviation to ensure air traffic safety. Among special weather forecasts are mountain area forecasts, forecasts for the coast, warnings on fire risk in the natural environment, snow conditions, and warnings and forecasts for farmers. In the last decade the national forecast service has been forecasting the impact of weather on human health and behaviour; the UV index also deserves special attention, as it helps us to use proper protection against the sun’s strong rays. The service, together with the Institute of Public Health, forecasts allergenic pollen levels in the atmosphere. Amateurs and others desiring more information can access the results of prognostic model calculations offering more detailed information of the future weather developments over Slovenia.

Climate comprises weather characteristics over a long period, covering weather variability during a day, a year or several years. Slovenia is a very diverse country as regards climate, in that there are Mediterranean, Alpine and continental climates intertwining; only a good knowledge of climatic characteristics and differences allows us to manage this natural resource. For example, building insulation, drainage systems and infrastructure are designed on the basis of climate data. Without quality data, there can be no efficient planning in the use of renewable energy sources, such as sun and wind, nor efficient planning in tourism, construction, transport and agriculture. Climate data serve us in the assessment of its long-term impact on humans, animals and plants. The latter are the domain of agrometeorology. Other characteristic weather phenomena and events are also monitored, for example major tropical storms and the hole in the ozone layer over the South Pole.
Earthquakes count among the worst natural disasters. Throughout history they have claimed several million lives (in the 20th century alone, 1.6 million people lost their lives to earthquakes). The threat of intensity 7 earthquakes exists in most of Slovenia, and there are some areas where earthquakes of intensity 8 or even 9 according to EMS (12-degree European Macroseismic Scale) can occur. The strongest earthquakes that have shaken our ground were the Carinthian earthquake of 1348, the Idrija earthquake of 1511 and the Ljubljana earthquake of 1895. They all claimed lives. In the 20th century there have been more than 20 earthquakes in Slovenia, which caused minor or major damage to property but, luckily, no loss of life. Earthquakes causing property damage are relatively frequent in this region, and therefore, certain precautions are necessary, especially in construction.

With regard to the number and intensity of earthquakes, the territory of Slovenia is quite an active area. This is because the country lies on the seismologically active southern boundary of the Eurasian tectonic plate on the northwestern boundary of the Mediterranean-Himalayan seismic belt, which is one of the most seismologically active zones on Earth. The reasons for numerous weak as well as strong earthquakes lies in the complex geological and tectonic structure of this territory, which lies on the small Adriatic plate squeezed between the African plate in the south and the Eurasian plate in the north. Movement in different directions builds up tension that can cause earthquakes.

The Agency monitors and evaluates earthquakes on the entire territory of Slovenia and beyond, and provides information on seismic activity to the relevant national authorities, general public and media. In addition, it is responsible for international data exchange with 26 seismological centres, and it plans and sets up permanent seismic stations in Slovenia, along with temporary ones during periods of higher seismic activity. After earthquakes the Agency carries out macroseismic surveys, collects and processes historical data on earthquakes and complex earthquake catalogues. It collects and studies data on neotectonic, geological, geophysical and similar phenomena related to seismic activity.

The Agency also carries out tasks in the field of earthquake engineering and engineering seismology, develops expert grounds for regulations and norms for earthquake resistant construction, prepares documents for the earthquake resistance of important construction projects, and processes and interprets records of strong earthquake accelerations. In order to make good-quality maps of earthquake risk, hazard and vulnerability, a good network of seismic stations is needed, along with, of course, a knowledge of earthquake history, geology, seismology, seismotectonics and other fields. The most endangered areas in Slovenia are the upper Posočje region and the region around Ljubljana, Križanke and Brežice. Earthquake focal points are formed throughout the entire territory of Slovenia, the least abundant being in the most north-western region. In Slovenia earthquakes have been measured with instruments since 1958. On the basis of weak and, in particular, strong earthquakes, and of geological, seismological and other studies, the Agency has drawn up maps of earthquake risk and hazard in Slovenia. The earthquake map of Slovenia offers a basis for improving the existing regulations on construction in seismic areas and is essential for spatial and urban planning and design. After the earthquake in the upper Posočje region in 1998, the Government of the Republic of Slovenia approved the resources to build a national network of 25 seismic stations. With this adequately dense and well-equipped network, earthquake risk in Slovenia is gradually diminishing.
Hydrology

Hydrology is one of the oldest fields of geophysical science. In the broadest sense, hydrology covers the study of water phenomena, characteristics and movement of water in the hydrosphere and of its relation to other environmental elements, including living beings.

Measuring network and measurements

Slovenia is a water-rich country. Water wealth and the diversity of the water regime is a consequence of the exceptional geographical position of the country, where Alpine, Pannonian and Mediterranean regions converge. This inspired the rich development of hydrological science. The first data from hydrological observations in Slovenia date from the first half of the 19th century.

Regular observations on river courses at ten water-measuring stations started in 1850, on underground waters since 1890. Regular measurements on lakes and the sea began in the 20th century. Contemporary measurements of surface waters have continuously been carried out since 1948, on underground waters since 1952 and on the sea since 1957.

The beginnings of hydrological prognostic activities date back to 1964. In 1965 the national hydrological service started water quality monitoring programmes. In the last few years, significant progress has been made in modernising the hydrological measuring network and measuring equipment, and ensuring the good quality of hydrological data. More and more often, mathematical modelling tools and modern detection methods for hydrographic phenomena are included in hydrological analytical and prognostic work.

The number of observed and measured parameters has also increased: water level, water flow speed or flow rate, water temperature and suspended matter. Certain of these parameters are also measured at the stations in the measuring network for underground water hydrological monitoring, along with the depth at which underground water occurs and its specific electrical conductivity. At the nauticalographic station in Koper and oceanographic buoy in Piran, sea depth, water temperature, and sea waves and currents are monitored. After basic processing and verification, the collected data are stored in the national hydrological database.

Forecasts and warnings

In an era when the effects of climate changes are manifested in more frequent and stronger extreme hydrological events, the monitoring of current water levels in rivers and forecasts of and early warnings of floods or droughts are important for the protection of lives and property and for sustainable development of areas along rivers. For this purpose the Agency participates in international systems and protocols for early warning against extreme hydrological events.

The tasks of the national hydrological service are closely related to the tasks of integrated water management, ranging from the planning, implementation and reporting of results in the operational hydrological area to the analysis and assessment of the impacts and modeling of processes in the hydrosphere. These activities are important for the assessment of quantitative water status and evaluation of national water resources. With hydrological balancing methods the national hydrological service assesses available quantities of water resources in Slovenia. It studies changes in the ratio between the quantity of precipitation over Slovenia, run-off of surface water and underground water resources in different historic periods. With the ever-increasing pressure modern society puts on water and the near-wild environment, the Agency strives to raise public awareness of sustainable water management.
In each drop there is new life.

Water management

Water is managed in river basins and catchment areas, that is, in naturally defined areas called river basin districts, where surface and underground waters are dealt with together. In Slovenia there are two parts of the international river basin districts of the Danube river basin and Adriatic catchment area. Within the Danube basin there are parts of the Sava, Drava and Mura river basins, while in the Adriatic catchment area there is a part of the Soča river basin and catchment areas of rivers flowing into the Adriatic.

Management of watercourses and the sea-coast

There are 30,000 km of watercourses and 41 km of sea-coast in Slovenia. Natural conditions and the already-felt impact of human activity, in narrow river valleys as well as on the sea and plains, demand adjustment of the water regime and morphology. Hence, water infrastructure is built to manage waters. This includes embankments, dams, weirs, reservoirs, facilities for water monitoring, etc., which are built for the benefit of the public, among other reasons to protect the population against the potential damaging action of water and to ensure water resources for the drinking water supply.

Water infrastructure must be managed and maintained. And because of the erosion power of water and its natural capacity for changing river beds, as well as lake and sea-shores, and the characteristic of watercourses that they carry debris and deposit sediment, all of which affects human activity, the excess of sediment and debris, and excess plant growth, have to be removed. The tasks of maintenance and monitoring of water and waterside land is carried out through public utility services. The Agency directs and manages the operation of public utilities through the mechanism of concessions and yearly action programmes in eight areas: four in the Sava, Drava, Mura and Soča river basins and in the catchment area of Adriatic rivers and the sea.

Its simplicity is full of secrets
Water rights

The Water Act defines surface and underground waters and the sea as public assets to be managed by the state, which is entrusted to ensure that the water is used efficiently and sustainably, and that available water reserves are protected in the long term. The principle of the Water Act is that anyone can use water as long as there are no adverse effects on the quality and quantity of water reserves. The use of water can be general (bathing, skating, diving, drinking and other personal uses, where no devices or structures are needed) or special (use exceeding the limits of general use). In order to protect the existing water reserves in the best possible way and to effectively monitor and manage the methods and quantities of water use, the Water Act lays down that a water right has to be acquired for water for special purposes. The right is granted for a limited period and must be paid for (water right and water use fees). Thus any special use of waters or water land is subject to a water right in the form of a water permit issued by the Agency or a concession granted by the Government. A water permit is required for purposes such as: drinking water supply, process water, bathing areas and spas, heat production, irrigation of agricultural land, powering of a watermill or sawmill, aquaculture, and snow making. The Government grants concessions for purposes such as: beverage production, bathing areas where thermal, mineral or thermo-mineral waters are used, electricity production in hydro power stations, extraction of alluvial deposits, and commercial aquaculture. Funds from water rights and water use fees are collected in the Water Fund and are used for water management.

Procedures

The main task of water management is to achieve and maintain the good status of waters and related ecosystems. The most important are procedures that provide for the protection of aquatic environments, of natural morphological changes and of the quality of existing water reserves primarily by prohibiting or restricting certain activities. To this end, water and waterside land, water protection areas, bathing areas, areas liable to flood, and areas liable to erosion and landslides have been introduced as part of the legal regime, where activities are only permitted in case of expressly specified exceptions, provided that they have no adverse effects on waters.

Foremost is the adjustment of human activities to the natural water regime; only then follows the adjustment of the water regime to an activity, which must be carried out very carefully and with prior assessment of long-term effects on the water regime and, consequently, on humans as part of the ecosystem. In order to ensure that an activity is adequately adjusted to the natural water regime, the Agency directs procedures for the preparation of guidelines and opinions on spatial planning acts in the field of water management and issues water consents for all activities affecting the water regime or water status.
The Environmental Agency of the Republic of Slovenia is directly involved in the implementation of international conventions ratified by Slovenia. As an active member it participates in international organisations, projects and working groups.

CONVENTIONS:
• Convention of the World Meteorological Organization - establishes the World Meteorological Organization (WMO), a specialised UN agency and a leading expert organisation for hydrology and meteorology. It constitutes a basis for the operation of the national meteorological service and national hydrological service within the Agency. The Convention governs international cooperation in the field of meteorology and hydrology, and the standardisation of measurements and other procedures in all countries of the world.
• Barcelona Convention - on protection of the marine environment and coastal areas of the Mediterranean Sea. The Agency actively participates in two sub-commissions: for hydrology and for pollution prevention.
• Danube Convention - on cooperation in the protection and sustainable use of the Danube River. On the basis of the Convention, international commissions have been established: the Standing Slovene-Austrian Commission for Water Management and Standing Slovene-Croatian Commission for Water Management; within those commissions there are numerous working groups in which the Agency actively participates in water management and hydrological monitoring.

In nature, too, everything is related.

Exchange of information and experience has no limits.
• Convention on Long-Range Transboundary Air Pollution - This Convention was proposed by the WMO with the aim of establishing the monitoring of long-range dispersion of pollutants in the atmosphere. In Slovenia the Agency maintains a measuring point that fulfils the requirements and objectives of the Convention; the Agency also participates in Convention working bodies.

• Vienna Convention for the Protection of the Ozone Layer and Montreal Protocol on Substances that Deplete the Ozone Layer - also WMO's daughter entities, which in the recent past have played a key role in reducing the use of substances depleting the stratosphere ozone layer.

• Convention to Combat Desertification - the Agency participates in Convention activities as a national coordinator. Efforts of the Agency and its (agro)meteorologists are devoted mostly to the study of droughts and mitigation of their consequences.

• UN Framework Convention on Climate Change - also formed on the initiative of the WMO. The Agency carries out operational monitoring of climate changes in Slovenia at reference climate stations, maintains national records of greenhouse gases and prepares expert groundwork for adjustments to climate changes.

• Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) - As the CITES Management Authority the Agency carries out procedures for issuing CITES permits and certificates, draws up reports for the CITES Secretariat and EU Commission, cooperates with enforcement authorities (customs, police, inspection authorities) and provides regular training, cooperates with management authorities of other countries and with international organisations, and organises public information campaigns.

• Convention on the Conservation of Migratory Species of Wild Animals (CMS) - the Agency participates in activities related to the Convention and ACCOBAMS agreement (marine mammals) as a national coordinator.

• Convention Establishing the European Centre for Medium-Range Weather Forecasts - the quality of its results makes the Centre the best organisation of its kind in the world. Slovenia has concluded a cooperation agreement with the Centre and actively cooperates with it. In 2005 the Council of the Centre adopted amendments to the Convention, which allow the accession of new members. When the amendments are ratified by all 18 current Members and enter into force, Slovenia will apply for full membership.

• EUMETSAT Convention - establishing the European Organisation for the Exploitation of Meteorological Satellites. In 2003 Slovenia signed a cooperation agreement with EUMETSAT, which places it in a sort of a waiting area for full membership. The Agency is the national agency responsible for cooperation with the most important European organisation for satellite monitoring of the atmosphere and Earth surface.
MEMBERSHIPS:

• European Environmental Agency (EEA)
  - in the EEA, 32 Member States are joined with the shared aim of providing, through the European environment information and observation network (EIONET), an integrated environmental information system for gathering and analysing common environmental data of the European Commission services, EEA Member States, international organisations, conventions and agreements, and to offer advice on suitable policy and make environmental information available to the general public.

• International Seismological Centre

• European Mediterranean Seismological Centre

• International Federation of Digital Seismograph Networks (FDSN)

• European Sea-Level Service (ESEAS)

PARTICIPATION IN WORKING GROUPS AND PROJECTS:

• working group for the implementation of European directives

• international expert working groups

• international commissions for water management issues: Slovene-Austrian for the Drava and Mura Rivers, Slovene-Croatian, Slovene-Hungarian and Slovene-Italian

• European projects in the field of flood warning and prediction and of sea level monitoring

• EU projects in the field of seismology and geology (rapid earthquake data exchange), especially fruitful is being participation in the INTERREG project, which promotes sustainable development in the Alpine region and the COST project for the monitoring of active tectonic structures

• INTERREG and COST projects for cooperation in science and technology in the field of meteorology

• ALADIN and ALADNET projects and expert panels on air traffic safety

• cooperation projects with Italy and Austria in the field of hydrology under the INTERREG programme
The environment is conserved through awareness

A kaleidoscope of information helps us keep in touch.

Serial publications
- Mesečni bilten (Monthly Bulletin)
- Varstvo narave (Nature Protection)
- Meteorološki letopisi (Meteorological Yearbooks)
- Hidrološki letopisi (Hydrological Yearbooks)
- Spremljanje kakovosti površinskih vodotokov v Sloveniji (Surface Stream Quality Monitoring in Slovenia)
- Spremljanje kakovosti jezer (Lake Quality Monitoring)
- Analiza letnih poročil o ravnanju z embalažo (Analysis of Annual Reports on Packaging Management)

Monographs
- Vodno bogastvo Slovenije 2003 (Water Wealth of Slovenia 2003)
- Poročilo o kakovosti podzemnih voda (Report on Underground Water Monitoring)
- Poročilo o kakovosti voda za življenje slabovidečih vrst rib (Reports on the Quality of Waters Supporting Fresh-Water Fish)
- Poročilo o spremljanju kakovosti površinskih vod, ki se jih odvzemajo za oskrbo s pitno vodo (Report on the Monitoring of the Quality of Surface Water Abstracted for Drinking Water Supply)

Topics
- Environmental protection
  - Environmental Indicators 2003, 2004
  - Poročilo o kakovosti podzemnih voda (Report on Underground Water Monitoring)
- Nature conservation
  - Osnove sodobne arboristike, 2001 (Basics of Modern Tree Care, 2001)
  - Konvencija o biološki raznovrstnosti, izgibanka, 2001 (Convention on Biological Diversity, pamphlet, 2001)
  - Regijski park Mura, 2001 (Mura Regional Park, 2001)
  - Pregled stanja biološke raznovrstnosti in košnjavega področja v Sloveniji, 2001 (Biological and Landscape Diversity in Slovenia: an overview, 2001)
  - Biological and Landscape Diversity in Slovenia: an overview, 2001

Publications
- Environmental issues No 22, a translation of: Late Lessons from Early Warnings, 2004
- Save Endangered Animal and Plant Species - Think Before You Buy, pamphlet, 2002
- Raziskava med trgovinami z živali, 2002 (Survey of Shops Selling Live Animals,
2002
• Regijski park Mura, 2. ponatis, 2003 (Mura Regional Park, second reprint, 2003)
• Trideæelni park Goriπko - Raab - Õrségf, Living Environments and Their Inhabitants, 2003
• Habitatni tipi Slovenije - Tipologija, 2004

Seismology
• Potresi v letu 1999, 2001
• Potresi v letu 2000, 2001
• Izdelava strokovnih podlag za Pravilnik o potresno odporni gradnji inæenirsko-seizmoloπko podlage za ocenjevanje potresne nevarnosti, 2001
• TolmaË karte potresne nevarnosti Slovenije, 2002
• Potresi v letu 2001, 2003
• Seizmoloπko opazovanje pregrade VogrπËek, Projekt za pridobitev gradbenega dovoljenja in projekt za izvedbo gradbenih konstrukcij in elektriËnih napeljav, 2003
• Revised PSHA for NPP Krπko site, PSRNEK-2.7.2., 2004

Meteorology
• Veter na Primorskem, 2001
• Meritve, spremljanje in prikazi podnebnih razmer v Sloveniji, 2003 (tudi elektronski vir) (Measurements, Monitoring and Presentation of Climate Conditions in Slovenia, 2003 (also in electronic form))
• Ranljivost slovenskega kmetijstva in gozdarstva na podnebno spremenljivost in ocena predvidenega vpliva, 2003
• Meteoroloπka postaja Kredarica 1954-2004, 2004
• Spremembe podnebja in kmetijstvo v Sloveniji, 2004
• Klimatografija Slovenije: Precipitation, 1951-1980
• Klimatografija Slovenije: Air temperature, 1951-1980
• Klimatografija Slovenije: Degree days and the duration of the heating season 1961-1997
• Klimatografija Slovenije: Duration of solar radiation, Analysis of the duration of solar radiation in Slovenia and global solar radiation in Ljubljana, 1971-2002

Hydrology
• Zgodovinski oris razvoja hidroloπke mreæe - Povrπinske vode, 2002 (Brief History of Hydrological Network - Surface waters, 2002)
• Mreæa hidroloπkih vodomernih postaj za povrπinske vode - ocena primernosti obstojeæe mreæe, 2002 (Network of Hydrological Measuring Stations for Surface Waters - Assessment of the suitability of the existing network, 2002)
Important years and events

History teaches us how to plan for the future.

Milestones

2001 establishment of the Environmental Agency of the Republic of Slovenia
2001 membership in the European Environment Agency
2001 setting-up of the European environment network - EIONET in Slovenia
2001 innovation of the air quality measuring network and Calibration Laboratory
2002 opening of the network of seismic stations around the Krško nuclear power plant
2003 signing of the cooperation agreement with the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)
2002 introduction of the acoustic Doppler technique in hydrometry

2003 accreditation of the Chemical Analysis Laboratory
2003 opening of the national network of seismic stations in the Primorska region
2003 staff of the development and application of conceptual hydrological prognostic modelling
2004 opening of the network of seismic stations in Ljubljana
2004 designation of the Calibration Laboratory as a national reference laboratory for air quality
2004 setting-up of the Water Management Office

2005 designation of the Calibration Laboratory as the Regional Instrument Centre for South-East Europe - for meteorology
2005 inclusion of sea monitoring in the European Sea-Level Service (ESEAS) and the setting-up of the restored mareographic station in Koper
2006 integration with the European Flood Alert System (EFAS)
2005 setting-up of the registry for greenhouse gas emission trading and start of the trading in emission coupons
2006 issue of the first integrated environmental permit for large polluters (IPPC)
The environment is a part of us.