

## Water environment data collection system in Estonia

*Compiled by Karin Pachel*

*Estonian Environment Information Centre*

**Estonian Ministry of the Environment (MoE)** <http://www.envir.ee/> is the higher executive body for environmental protection in Estonia. MoE is responsible for environmental policy making and planning at the national level. It develops environmental legislation covering the areas of air, marine, surface and groundwater, nature conservation and use of natural resources (including forest, fish stock, mineral and land resources), physical planning and construction.

The scope of matters that Estonian Ministry of the Environment has to regulate is ample. It is responsible for regulating the questions concerning the protection of nature and environment, solving the tasks concerning the land-use (with keeping the national land cadastre), including co-ordination of the elaboration of regional plans, managing the use, protection and accounting of the natural resources, as well as surveillance over the use of environmentally hazardous compounds. Through its various programmes, the Ministry of the Environment organises environmental monitoring, meteorological, geological, constructional and geodetic surveys and research in natural history. It arranges the environmental impact assessments of the projects of national importance and co-ordinates international relations in environmental matters. The Ministry of the Environment formulates national policies in its field of activities and prepares the bills of respective legal acts.

Estonia is administratively divided into 15 counties, all of which have **environmental department** (Environmental Service) functioning as structural unit of the MoE.

### The main functions of **the fifteen County Environmental Departments**:

- implement national environmental, nature protection, forest and fisheries programmes and action plans in the counties;
- coordinate and manage protection and use of the counties' natural environment,
- issue, if necessary, permits for the use of environmental and natural resources and manage relevant data bases;
- manage information gathering and reporting in the field of environment and nature use;
- submit the relevant reports to the Ministry and the County Governor;
- administrate protected natural objects designated by the Government of the Republic;
- manage protection of rare fossils and minerals as well as registration and protection of rare species and their habitats;
- participate in the development of Natura 2000, the Pan-European protected areas network;
- review and give replies to forestry notices;
- perform expert analyses on forest protection and assessment of stands suitable for forest seed mobilization;
- select key habitats and propose to the Ministry conclusion of habitat protection contracts;
- manage transactions with private forest affairs in transition until establishment of a new owner;
- assess forest renewal and propose forest renewal works to be funded from the state budget;
- manage the development of the counties' waste management plans,
- draft programmes for renewal and protection of fish resources;
- propose fishing gear prohibitions, fishing limitations and desired fishing permit fees;
- manage the collection of fishing and fisheries renewal data;
- manage the protection of ground water quality and resources including bored wells and important springs;
- keep and maintain registers of still and flowing water bodies;
- keep and maintain registers of the counties' mineral resources;

- participate, if so provided, in environmental impact assessments;
- review and give opinions on designs and plans, if and to the extent provided by law;
- notify the Ministry's management, the County Governor, the Environmental Inspectorate and the public of any accidents having impact on the nature;
- manage activities in the field of public mobilization, environmental education and publicity;
- counsel the county-based government agencies and local municipalities on matters within their competence;
- propose amendments to environmental legislation;
- review applications for state funding of environmental constructions;
- propose inclusion of the county's financing needs in the specific research programme and manage financing of the approved programme.

## **Jurisdiction of the Ministry**

Estonian Land Board

Environmental Inspectorate

Centre of Forest Protection and Silviculture

Estonian Environment Information Centre <http://www.keskkonnainfo.ee>

Estonian Meteorological and Hydrological Institute

Radiation Protection Centre <http://www.envir.ee/kiirgus/eng/>

State Forest Management Centre [http://www.rmkk.ee/index\\_eng.php3](http://www.rmkk.ee/index_eng.php3)

Geological Survey of Estonia

Estonian Map Centre Ltd

Forest Survey Centre

Estonian Environmental Research Centre

Tartu Environmental Research Ltd <http://www.tkku.ee/>

Tartu Nursery Garden

Põlula Fish Rearing Centre

National Parks <http://www.ekal.org.ee/ekal/index-en.htm>

Nature Conservation Areas <http://www.ekal.org.ee>

West Estonian Archipelago Biosphere Reserve <http://www.bka.hiiuloodus.ee/eng.html>

Nature Conservation Organisations <http://www.ekal.org.ee>

## **Estonian Environment Information Centre**

<http://www.keskkonnainfo.ee>

The primary function of Estonian Environment Information Centre (EEIC) was processing of environmental information. By the current time many tasks have come in addition:

- collecting, analysing and providing environmental data;
- compiling and issuing of environmental reviews;
- participating in state environmental monitoring programme;
- transforming environmental data into geo-referenced data (GIS) and processing of spatial data;
- maintaining of environmental information systems, e.g. information system of environmental permits (<http://klis.envir.ee/klis>);
- contributing to elaboration of environmental legislation;
- providing consultations, expertise and assessments in its field of activity;
- acting as a national focal point (NFP) for European Environment Agency and UNEP/Infoterra network;
- acting in the consortia of EEAs ETC/NPB and ETC/WMF;
- exchanging with and reporting of environmental data to EEA, EUROSTAT, European Commission, UNEP and other international institutions;

There have been environmental reporting systems in operation in Estonia since Soviet time. At the moment there are about 40 environment databases existing in Estonia. The databases include data about emissions into the environment as well as the monitoring data about the state of the environment. There is a data concerning air, wastes, landfills, marine, surface and ground water, nature conservation, use of natural resources, waste water and waste water treatment plants.

At the local level Estonia is divided into 207 communities and 47 towns. Virtually none of these has a separate environmental department or unit but a number of municipalities have employed environmental specialists.

Under MoE the Environmental Information Centre (EIC) is responsible for collecting, reporting and publishing environmental information and data. Environmental Inspectorate is responsible for coordination and management of the enforcement of natural resources legislation.

By the end of every year EIC sends questionnaires on Air Emissions, Waste and Water Use to the Environmental Services. Environmental Services sends these questionnaires to the enterprises. Enterprises fulfil the data sheets and send back to the Environmental Services. Environmental Services collect all the data and control the data gave by the enterprises. After that Environmental Services sends the fulfilled questionnaires to the EIC.

The responsible institutions of national monitoring collect data for their programs, process it and send to EEIC. Legal basis for environmental monitoring is written down in Environmental Monitoring Act.

## **Environmental Monitoring Act**

Passed 20 January 1999, entered into force 15 February 1999, last amendment 19 June 2002

[http://www.legaltext.ee/en/andmebaas/ava.asp?tyyp=SITE\\_ALL&ptyyp=I&m=000&query=Environmental+Monitoring+Act&nups.x=28&nups.y=10](http://www.legaltext.ee/en/andmebaas/ava.asp?tyyp=SITE_ALL&ptyyp=I&m=000&query=Environmental+Monitoring+Act&nups.x=28&nups.y=10)

### **§ 2. Environmental monitoring and purposes thereof**

- (1) Environmental monitoring is the continuous observation of the state of the environment and the factors affecting it, the main purpose of which is to predict the state of the environment and to obtain data for programmes and plans and for the preparation of development plans

### **§ 5. Environmental monitoring carried out by enterprise**

- (1) Enterprise shall carry out environmental monitoring at the expense of the enterprise in the area affected by its activities or by pollutants discharged into the environment as a result of its activities
- (4) Data from environmental monitoring carried out pursuant to a natural resources exploitation permit or a pollution permit shall be submitted by the enterprise to the issuer of the permit on the date specified in the permit

Water environment data is kept in the State Water Cadastre, which legal basis is wrote down in the Water Act § 36. Water resource records.

## **Water Act**

Passed 11 May 1994, entered into force 16 June 1994

## § 36. Water resource records

- (1) Water resource records are kept so that data on the volume, level, quality, use and users of water can be maintained in the long term and issued if necessary
- (2) Water resource records shall be kept in a **state register as a water cadastre** in accordance with the procedure provided by legislation regulating the establishment, introduction, maintenance and liquidation of state registers.

## State Water Cadastre

*Ratified by Estonian Government Regulation No. 324 of 26 October 1999*

### I General Provisions

1. The purpose of keeping the state water cadastre is to keep record of the amount, level, quality, use and users of water in Estonia and long-term holding and issuing of data
2. The official name of the register is “State water cadastre”
3. State water cadastre is a one-level database. The responsible processor of the database is the Ministry of Environment and the authorized processor is the Environment Information Centre

### II Composition of State Water Cadastre

4. The state water cadastre consists of:
  - 1) surface water database;
  - 2) groundwater database;
  - 3) marine water databa
  - 4) water use and wastewater (hereafter water use) database;
  - 5) registration files of data reception and issuing.

### III Procedure for Keeping "State Water Cadastre “

14. State water cadastre is kept both digitally and on paper files

### IV Access To the State Water Cadastre Data

21. The data of “State water cadastre” are public, except the coordinates of drinking water bored wells (Environmental Monitoring Act § 8 section 2 subsection 1; RT I 1999, 10, 154; 54, 583) which are only disclosed to government institutions, state institutions subordinated by government institution and local government institutions for duties prescribed to them by law.
22. The data from “State water cadastre” are available free of charge.

## Data in the State Water Cadastre

### Marine Water

*Number of the stations:* 36, 6 in the international Helcom network

*Parameters:* depth, PO<sub>4</sub>, P<sub>tot</sub>, SiO<sub>4</sub>, NO<sub>3</sub>, NO<sub>2</sub>, NH<sub>4</sub>, N<sub>tot</sub>, heavy metals, transparency, O<sub>2</sub>, temperature, salinity, thickness, phytoplankton, zooplankton, chlorophyll-a

*Time period:* since 1993

*Software:* FoxPro, Excel

*Monitoring authority:* TU Estonian Marine Institute, TTU Marine Systems Institute

### Rivers runoff

*Number of the stations:* 138, in 2004 operated 36

*Parameters:* average daily runoff, average monthly runoff, maximum monthly runoff, minimum monthly runoff, long term annual average runoff

*Time period:* since 1902, according to the station operation time

*Software:* FoxPro, Excel

*Monitoring authority:* Estonian Meteorological and Hydrological Institute

### Rivers chemical monitoring

*Number of the stations:* 60, 15 in the Helcom network

*Parameters:* temperature, SS, pH, O<sub>2</sub>, BOD<sub>7</sub>, COD<sub>Mn</sub>, NH<sub>4</sub>, NO<sub>2</sub>, NO<sub>3</sub>, N<sub>tot</sub>, PO<sub>4</sub>, P<sub>tot</sub>, HCO<sub>3</sub>, SO<sub>4</sub>, Cl, Ca, Mg, Na, Si, conductivity, colour, Hg, Cd, Zn, Cu, Pb (not in all stations)

*Time period:* since 1992

*Software:* FoxPro, Excel

*Monitoring authority:* Tallinn Technological University, Environmental Engineering Department

### Rivers biological monitoring (integrated with physical and chemical parameters)

*Number of the stations and frequency:* 55 stations in 5 rivers (with main tributaries) in 5 years rotating cycle

*Parameters:* runoff, temperature, pH, O<sub>2</sub>, BOD<sub>7</sub>, COD, NH<sub>4</sub>, NO<sub>2</sub>, NO<sub>3</sub>, N<sub>tot</sub>, PO<sub>4</sub>, P<sub>tot</sub>, rivers width, depth, flow velocity, trophic level, nutrient limiting the primary production, granulometric type of bottom sediments, Chlorophyll-a, phaeopigment, phytoplankton biomass, dominant species, number of taxa, bacterioplankton total count, saprobic bacteria count, coli-index, mean coverage of macrophytes and dominant species, microphytobentos level, number of fish species, dominant fish species, saprobic index

1994, 1999 - Pedja, Ahja, Avijõgi, Reiu, Lõve

1995, 2000 - Võhandu, Pühajõgi, Kunda, Seljajõgi, Mustjõgi

1996, 2001 - Väike Emajõgi, Öhne, Pärnu, Navesti, Halliste

1997, 2002 - Põltsamaa, Elva, Amme, Kasari, Vigala

1998, 2003 - Valgejõgi, Jägala, Pirita, Keila, Vihterpalu

etc

*Time period:* since 1994

*Software:* FoxPro, Excel

*Monitoring authority:* Institute of Zoology and Botany

### Rivers macroinvertebrates

*Number of the stations:* 20 - 40 places per year

*Parameters:* general description of the place, macroinvertebrates taxonomic composition

1997 - Purtse, Pühajõgi,

1998 - Kunda, Seljajõgi,  
1999 - Toolse, Pada, Vasavere, Sõtke  
2000 - Võsu, Altja, Mustoja, Vainupea  
2001 - Loobu, Valgejõgi  
2002 - Pudisoo, Loo, Kuusalu, Valkla, Kaberla, Soodla  
2003 - Jägala basin  
2004 - Vääna, Pirita

*Time period:* since 1997

*Software:* Excel

*Monitoring authority:* Võrtsjärve Limnological Station

### **Small lakes chemical and biological parameters**

*Number of the stations:* 7 – 18

*Parameters:* t, pH, O<sub>2</sub>, COD<sub>Mn</sub>, COD<sub>Cr</sub>, NH<sub>4</sub>, NO<sub>2</sub>, NO<sub>3</sub>, N<sub>tot</sub>, PO<sub>4</sub>, P<sub>tot</sub>, HCO<sub>3</sub>, SO<sub>4</sub>, Cl, conductivity, transparency, phytoplankton: species number, biomass, dominant species, biomass of cyanophytes, diatoms, chlorophytes, chrysophytes, pyrrophytes; chlorophyll a,b,c, content of carotenoids and phaeopigments; zooplankton: number of individuals and dominants, biomass, indices of eutrophy and oligotrophy; percent of copepods, rotifers and cladocerans in total count; bacterioplankton: total count, count of saprobacteria, coli-index; macrozoobentos: species composition in littoral; macrovegetation: emergent, floating-leaved and submerged species, their state

*Time period:* since 1992

*Software:* Excel

*Monitoring authority:* Võrtsjärve Limnological Station

### **Large Lakes Peipsi and Võrtsjärv chemical and biological parameters**

*Number of the stations:* 14

*Parameters:* water level, t, colour, smell, transparency, alkalinity, hardness, pH, O<sub>2</sub>, BOD<sub>7</sub>, COD<sub>Mn</sub>, NH<sub>4</sub>, NO<sub>2</sub>, NO<sub>3</sub>, N<sub>tot</sub>, PO<sub>4</sub>, P<sub>tot</sub>, SO<sub>4</sub>, Cl, Ca, K, Mg, SiO<sub>2</sub>, Fe. Lake Peipsi oil and phenols from a surface layer twice per year, heavy metals (Hg, Cd, Zn, Cu, Pb) once a year, pH, transparency, biomass of phytoplankton, number of species, dominant species, biomass of cyanophytes, diatoms, chlorophytes, chrysophytes, pyrrophytes, concentration of chlorophyll a, b, c, phaeopigments and carotenoids; abundance of zooplankton, biomass, dominant species by abundance and biomass, percent of copepods, rotifers and cladocerans by abundance and biomass, total count of bacteria, plate count of saprophytic bacteria, abundance and biomass of macrozoobentos, abundance and biomass chironomid larvae, oligochaetes, small and big molluscs and other small bottom animals, dominant species by abundance and biomass.

*Time period:* since 1992

*Software:* FoxPro, Excel

*Monitoring authority:* chemistry-Tartu Environment Research Centre,  
biology-Võrtsjärve Limnological Station

### **Groundwater**

*Natural and near to natural conditions groundwater (basic network)*

*Number of the wells:* 190 - 400, according to the program

*Parameters:* aquifers, dry residual, mineralisation, transparency, hardness, Na, K, NH<sub>4</sub>, Ca, Mg, Fe<sub>2</sub>, Fe<sub>3</sub>, Cl, SO<sub>4</sub>, NO<sub>3</sub>, NO<sub>2</sub>, CO<sub>3</sub>, HCO<sub>3</sub>, pH, SiO<sub>2</sub>, water level

*Time period:* 1993 -

*Software:* Excel, Access

*Monitoring authority:* Estonian Geological Centre

### ***Sensitive areas groundwater***

*Number of the wells:* 90 - 100, according to the program

*Parameters:* aquifer, NH<sub>4</sub>, NO<sub>3</sub>, Cl, SO<sub>4</sub>, oil, heavy metals, organic compounds according to the program

*Time period:* 1991 -

*Software:* Excel, MapInfo

*Monitoring authority:* Estonian Environment Research Centre, Tartu Environment Research Centre, Ltd Maves

### ***Water use database contains:***

- name, location of water user and registration number in state databases;
- location of intake structure;
- sort and amount of extracted water, incl. groundwater by layers;
- field of water use and amount of water;
- name and location of recipient of sewer outlet;
- amount, sort and degree of purification of wastewater;
- pollution load by main pollution indices;
- sludge data
- WWTP data
- ....

*Time period:* since 1992

*Software:* FoxPro, Excel

*Authority:* Estonian Environment Information Centre

## **Environment Register**

The purpose of the establishing the **Environment Register** is to draw together all environment-related data into the one united national basic register and give the legal status for environment data used for environmental permits, development plans, natural resource management and international reporting.

### **Environmental Register Act**

Passed 19 June 2002, entered into force 1 January 2003

[http://www.legaltext.ee/en/andmebaas/ava.asp?tyyp=SITE\\_ALL&ptyyp=I&m=000&query=Environmental+Register+Act&nups.x=18&nups.y=10](http://www.legaltext.ee/en/andmebaas/ava.asp?tyyp=SITE_ALL&ptyyp=I&m=000&query=Environmental+Register+Act&nups.x=18&nups.y=10)

### **§ 1. Scope of application of Act**

This Act provides the bases for the entry of data regarding natural resources, natural heritage, the state of the environment and environmental factors in the environmental register, for the retention of data in the register and for the processing and release of the data

### **§ 2. Legal status and function of register**

- (1) The environmental register is a **general national register**
- (2) The function of the environmental register is to retain and process data regarding natural resources, natural heritage, the state of the environment and environmental factors and to provide information:

- 1) for the issue of permits, temporary permits or integrated environmental permits for the right to use natural resources, for waste management or for release of pollutants or organisms into the environment (hereinafter environmental permits);