

REPORT OF THE REPUBLIC OF LITHUANIA PURSUANT TO ARTICLE 9 OF THE MONTREAL PROTOCOL ENTITLED "RESEARCH, DEVELOPMENT, PUBLIC AWARENESS AND EXCHANGE OF INFORMATION"

In accordance with the Parties' obligations under Article 9 of the Montreal Protocol the Republic of Lithuania has prepared a report on activities performed in 2008-2009 pursuant to this Article.

This report contains information on:

- Observational and research activities related to stratospheric ozone and UV monitoring;
- Promoting of public awareness.

I. OBSERVATIONAL AND RESEARCH ACTIVITIES RELATED TO STRATOSPHERIC OZONE AND UV MONITORING

Atmospheric ozone and UV monitoring is conducted mainly by the Lithuanian Hydrometeorological Service under the Ministry of Environment (LHMS), which follows the standard programme of observations of the World Meteorological Organization recommendable for hydrometeorological services.

The total ozone column and UV operational measurements are made at following stations:

Overview of the ozone and UV monitoring locations in Lithuania

<i>Station</i>	<i>Location</i>	<i>UV-A</i>	<i>UV-B</i>	<i>Total ozone</i>
Kaunas	54°53'N, 23°50'E	x	x	x
Palanga	55°58'N, 21°06'E		x	
Preila	55°20'N, 21°00'E		x	
Aukstaitija	55°26'N, 26°04'E	x	x	

Column measurements of ozone and other gases/variables relevant to ozone loss

The state of ozone layer is monitored at the Kaunas meteorological station (WMO Index 312). Total ozone measurements have been carried out with the M-124 filter ozone-meter since 1 January 1993. The Kaunas station is located close to the centre of Lithuania. Routine measurements of total ozone are made (in daytime) up to a maximum of nine times per day by trained personnel.

Unfortunately, LHMS does not have ozone sondes and ozone lidar to make measurements of the ozone profile. For this reason the latter has not been determined during the period concerned.

UV measurements

Ultraviolet solar radiation measurements have been carried out at Kaunas and Palanga (by the Baltic Sea) since 2000. Mean and maximum daily radiation is monitored using the UV Biometers type 501 A, version 3 (in Kaunas – UV-A radiation and UV-B radiation, in Palanga – UV-B radiation). Continuously, ground-level UV radiation is measured at two background monitoring stations: UVB radiation at Aukstaitija and Preila by SKU430 UV-B (280-315 nm), global solar radiation - by the Pyranometer sensor SKS1110 (500-1000 nm).

Calibration activities

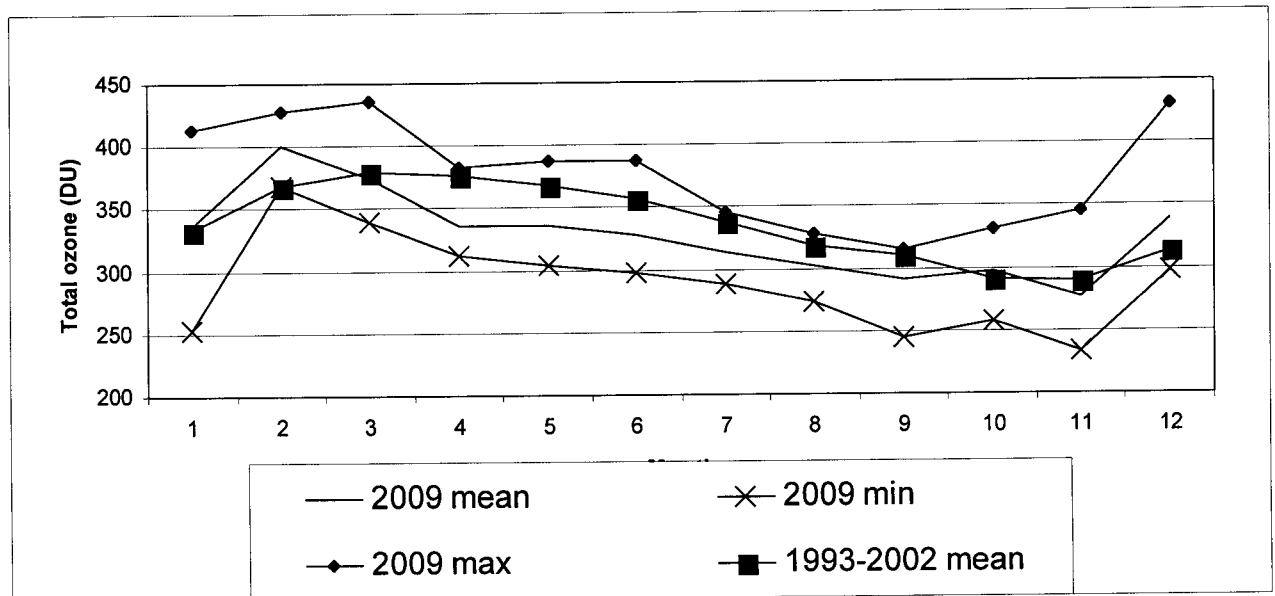
The network instruments are calibrated against the National Standard on the regular basis, every two years.

The M-124 filter ozone-meter had previously been calibrated every two years at the Remote Sensing Scientific Research Centre of the Main Geophysical Observatory in St. Petersburg, Russia. The last calibration (in 2010) was carried out by the LHMS Metrological Laboratory.

The UV-Biometers are calibrated by the LHMS Metrological Laboratory annually.

Results of the observations, other research and data reporting

In 2009, the total amount of atmospheric ozone fluctuated rather significantly. The minimum amount of atmospheric ozone (about 233 DU) was observed on November 9th, and the maximum (about 436 DU) was measured on March 25th. Mean annual amount of the total ozone was fixed at 328 DU level. Comparing with 2008 measurements, the total amount of atmospheric ozone increased by 5 % but was 2.7 % below the normal value.

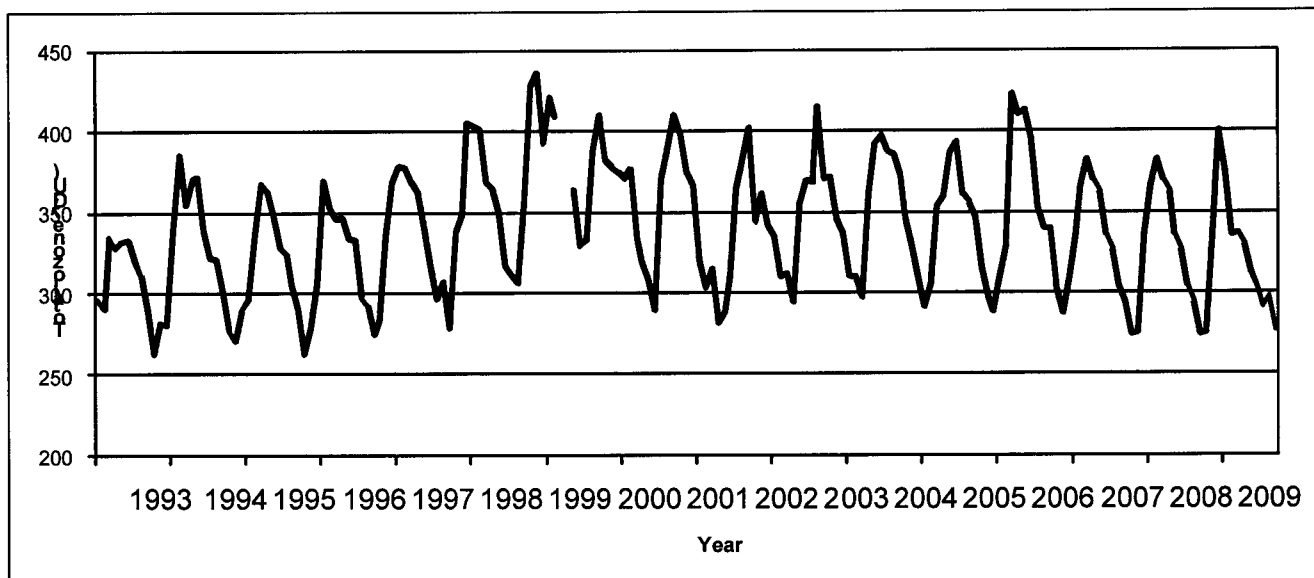


Total ozone mean annual cycle

All observational data are stored and processed on a regular basis. Due to comparatively short series of observations, they are considered insufficient for a comprehensive study.

The ozone measurement data are sent on a regular basis to the World Ozone and Ultraviolet Data Centre (WOUDC) in Toronto, Canada. Since 2004, also the UVB measurement data from the Kaunas station have been sent to WOUDC.

Ozone and UV research activities are carried on in the Vilnius Gediminas Technical University and Institute of Physics. The relationship between UVB radiation intensity and the total and ground-level ozone under low polluted Lithuanian rural conditions was studied and the influence of the changeable UV radiation on the ground-level ozone concentration was investigated (*Chadyšienė et al., 2008*). The continuous measurements of ground-level ozone are carried out at 4 backgrounds Lithuanian stations.



Total ozone fluctuation 1993–2009 (N 312 station, Kaunas)

Some scientific papers were published and dissertation works performed on ozone and UV radiation matter in 2008-2009 as indicated below:

Chadyšienė R., R. Girgždienė, Girgždys A., Relationship of total ozone amount, UV radiation intensity, and the ground-level ozone concentration at rural Lithuanian sites. Lithuanian Journal of Physics, 48, 1, 99-106, 2008;

Chadyšienė R., Research and evaluation of variations of ultraviolet radiation in environment. Doctoral thesis. Technological Sciences, Environmental Engineering (04T), No. 15558-M (the dissertation was defended on 16 January 2009);

Tretjakovas S., Chadyšienė R., Girgždys A. Ozone layer variations over Lithuanian territory and their relation with UVB radiation intensity. Proceedings of the Youth Seeks Progress-2009 conference for doctoral students. ISSN 1822-2331. 2009, Nr. 3, p. 206-209;

Tretjakovas S., Girgždys A. Experimental total ozone investigations by "Microtops II" remote ozone-meter and its applicability study. Proceedings of the 12th Conference of Young Scientists, Lithuania, 2009. Vilnius, Technika 2009, p. [1-4];

Liukaitytė J. Ultraviolet solar radiation data and forecast. Internal lecture for LHMS staff, 2009.

Projects and collaboration

Establishment of the UV monitoring network in Lithuania was supported by the Italian – Lithuanian Counterpart Fund. The Polish Institute of Meteorology and Water Management assisted LHMS in application of the UV Index forecasting model. To forecast the UV Index, data from the Human Biometeorology Unit (GF MM) of the German Meteorological Service (DWD) are used with modifications depending on local cloudiness. At present, no international or national projects on the study of ozone are conducted.

II. PROMOTING OF PUBLIC AWARENESS

Being aware that public awareness and exchange of information is important for successful implementation of the Montreal Protocol, relevant European and national legislation, the Government of the Republic of Lithuania considers the awareness rising as one of the priorities.

Taking into account that the refrigeration sector is the main user of ODS in Lithuania, in spring 2008 the Ministry of Environment together with the Refrigeration association conducted seminar for industry "Implementation of the EU legislation on ODS and F-gases in Lithuania". In autumn of the same year training courses for refrigeration and air conditioning (R&A) servicing companies were conducted to explore provisions of current and the recently adopted legislation.

The UNEP/UNDP GEF project "Total Sector Methyl Bromide Phase out in CEITs" was finalised in 2008. Various interested stakeholders: state institutions, non-governmental organisations, representatives of academic societies etc., - participated in the methyl bromide project. The Ministry of Environment coordinated the project implementation. The equipment procured under the project was transferred to the fumigation companies. Awareness raising and training was an essential part of the project. In the framework of the project information about methyl bromide alternatives was disseminated, including non-chemical alternatives, particularities of their application as well as facilitated registration of methyl bromide alternatives in Lithuania. Under the project recommendations on how to switch over to non-chemical alternatives were developed. These alternative methods have been implemented and being used in some enterprises.

In 2008 and 2009 attention was paid to further improvement of the information which is related to ODS and ODS waste management issues. The relevant information and recommendations were posted on the website of the Ministry of Environment. The following articles were newly added or recasted in the light of new developments:

- Information on laboratory and analytical uses;
- Reporting requirements under EU Regulation 2037/2000 as well as national legislation LAND 50-2004 „Requirements on ODS management”;
- How to apply for import/export/essential uses etc. quotas;
- Qualification requirements for personal involved in activities related to ODS and ODS containing equipment (for servicing companies, waste collection and treatment companies which recover, recycle, reclaim ODS), including comments on legal requirements and guidance on implementation thereof;
 - Destruction of ODS and a list of the European companies which collect ODS waste for destruction and destroy ODS;
 - ODS recovery, recycling and reclamation and an explanatory note how to use the Register of Waste Management Companies in order to search contact information of companies managing ODS waste in Lithuania;
 - Information about new European Union legislation on ODS and emerging changes of ODS control in EU including ODS import and export licensing (the new regulation was adopted in September 2009 with application from the 1 January 2010).

During the reporting period 2008-2009 the Ministry of Environment paid attention to better collaboration with the Customs authorities including consultations on ODS import and export licensing requirements and implementation procedures, dissemination of information on good practices of Nordic countries in enforcement of ODS requirements by customs officers and environmental inspectors (Guide to Customs Officers and Inspectors In Nordic Countries on Products Containing Ozone Depleting Substances, Nordic Council of Ministers, Copenhagen, 2008).

As it was stressed in our report of 2008, the main ODS user in Lithuania is the R&A sector, where main banks of ODS are contained at present. Therefore the following measures aimed at proper handling of ODS containing equipment were taken:

- Standard leakage checking requirements for stationary R&A equipment were adopted in 2008;

- In order to estimate banks of ODS in equipment, in 2009 the Ministry of Environment drafted an order of the Minister of Environment that provided for an ODS and F-gases inventory. Owners and users of ODS containing equipment shall report to the regional environmental department on:

- ODS equipment being in operation or available in the company;
- further changes stipulated by various actions e.g. if the equipment was sold, dismantled, retrofitted and etc.

The Order was adopted and entered into force in January 2010.

- Particular circular/guidance letters were prepared for Environmental inspectors and industry which uses R&A equipment relying on ODS supply, or which is involved in servicing R&A equipment, in ODS recovering, recycling and reclamation as well as in ODS waste handling.

The guidance letter to the inspectors mainly focused on control of banned and restricted uses of ODS and ODS containing equipment as well as on control of implementation of legislative provisions aimed at minimizing or eliminating emissions of ODS from R&A equipment.

The guidance letter devoted to the industry considered the implications related to the legislation being in force and those emerging from the new EU legislation, *inter alia*:

- bans and restrictions on ODS use in R&A sector;
- use of used ODS (recovered, recycled, reclaimed);
- particularities of ODS waste management;
- qualification requirements to personnel involved in ODS handling and use in R&A and waste management sectors;
- relevant reporting requirements.

The Ministry of Environment takes care of public information and awareness of the general public on level of UV radiation in Lithuania and risks related to it.

In 2008, an article on the significance of ozone layer, its measurements and fluctuations was prepared and posted on the LHMS website.

The LHMS provides information to the general public on UV conditions in Lithuania. In case of significant UV radiation caused by ozone layer fluctuations, the LHMS originates warnings disseminated through the mass media and over the Internet.

Since 2001, the LHMS Meteorology Division has been providing the UV index forecasts (UVI) for annual periods of May – August; since 2008, the forecasting period has been extended and the UV index is forecasted from 1 April to 1 October (during April – September). These forecasts are disseminated through the mass media and Internet.

Since 2002, the total ozone values and their changes as well as the ultraviolet solar radiation intensity figures are published in annual reports “State of the Environment” issued by the Ministry of Environment of the Republic of Lithuania.