

**REPORT OF THE REPUBLIC OF LITHUANIA
PURSUANT TO ARTICLE 9 OF THE MONTREAL PROTOCOL ENTITLED
„RESEARCH, DEVELOPMENT, PUBLIC AWARENESS AND EXCHANGE OF
INFORMATION“
For years 2010-2011**

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 2010-2011 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 LHMS carries out total ozone column and UV operational measurements at:

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	
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 ozonometer since 1 January 1993. The Kaunas station is located close to the geographical centre of Lithuania. Routine measurements of total ozone are made (in daytime) by trained personnel up to a maximum of nine times per day.

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

LHMS does not have ozone sondes and ozone lidar to make measurements of ozone profile.

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, UV-A and UV-B radiation is measured at monitoring station at Aukstaitija by SKU430.

Unfortunately, due to a sensor failure, UV-B solar radiation measurements at Preila have not been carried out since 2010-2011 period and up to date.

Calibration activities

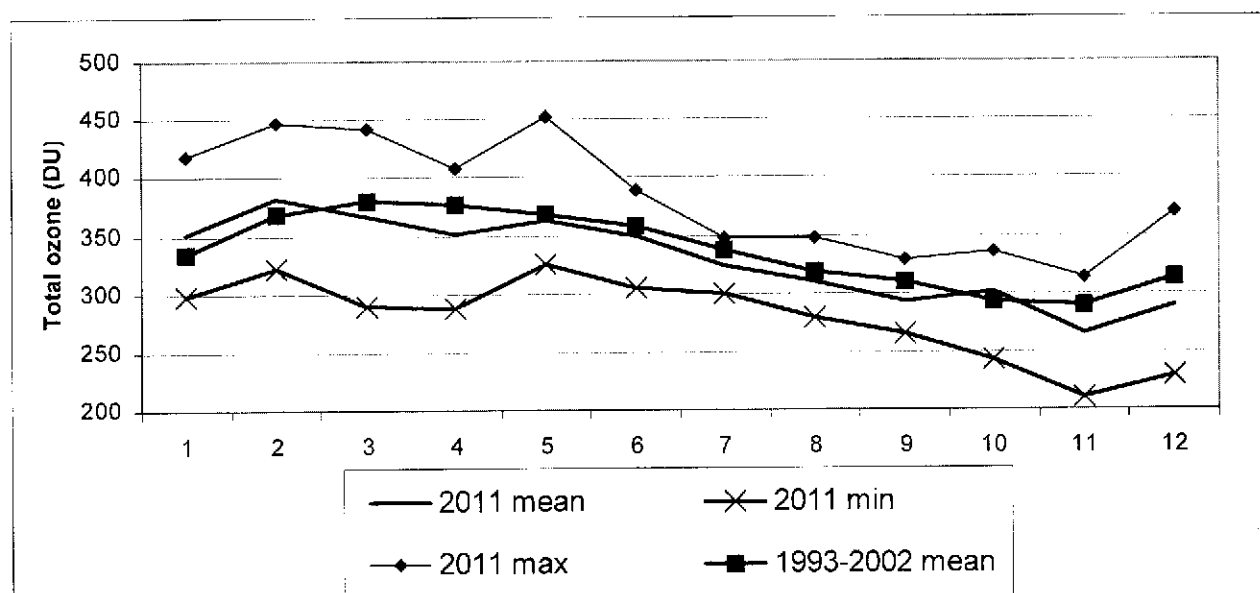
The network instruments are calibrated against the National Standard at regular intervals yearly.

The M-124 filter ozonometer had previously been calibrated at the Remote Sensing Scientific Research Centre of the Main Geophysical Observatory in St Petersburg, Russia, every two years. Since 2010 ozonometers have been calibrated by the LHMS Metrological Laboratory yearly.

The UV-Biometers have been calibrated by the LHMS Metrological Laboratory yearly. At the end of 2010, the Laboratory of Atmospheric Physics of the Thessaloniki University in Greece performed sensitivity calibration for a standard measuring instrument of LHMS Metrology Laboratory. Following that calibration, Kaunas and Palanga stations' biometers were recalibrated and since 1 January 2011 new recalculated coefficients have been applied to the ultraviolet solar radiation readings (the data differ from the previous).

Results from observations and data analysis

In 2011, the total amount of atmospheric ozone fluctuated rather significantly. The minimum amount of atmospheric ozone (about 210 DU, in 2010 – 250 DU) was observed the same day, as in 2010 – on November 15th, and the maximum (about 452 DU) was measured on May 6th (in 2010 – 458 DU on March 5th). Mean annual amount of the total ozone was 329 DU (in 2010 – 341 DU). Comparing with 2010 measurements, in 2011 the total amount of atmospheric ozone was less by 3.5 % and less by 2.4 % comparing to the normal value. (2010 annual mean comparing with 2009 measurements, the total amount of atmospheric ozone increased by 4.0 % and was 1.2 % below the normal value (multi-annual mean) .



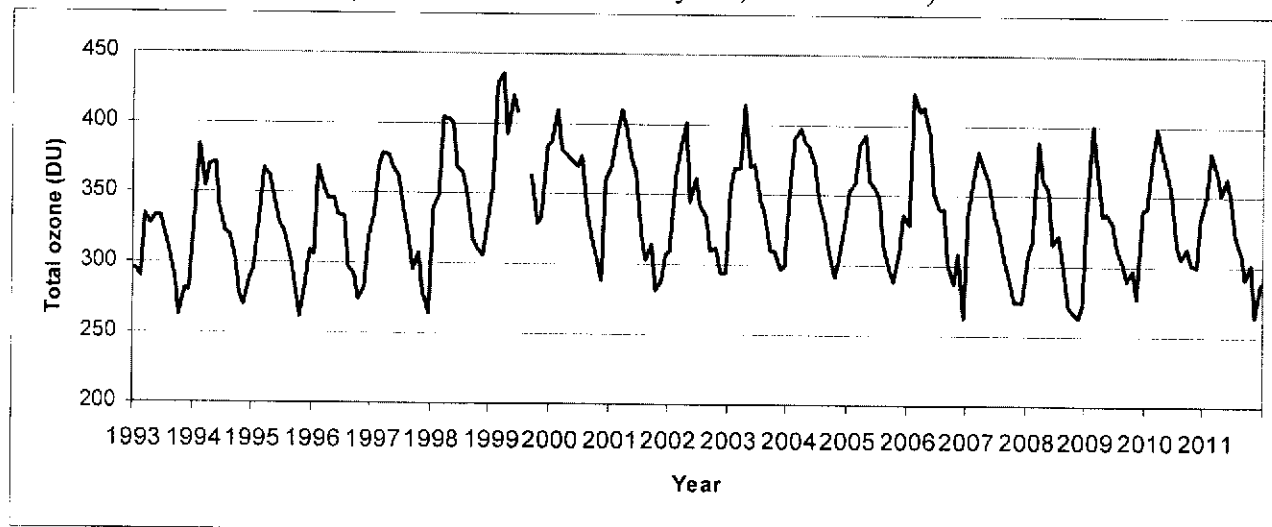
Total ozone mean annual cycle

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.

In 2003, the LHMS Meteorology Division carried out the ozone data analysis resulting in establishment of the mean total ozone values for the period of 1993 – 2002 that have since been used to assess the ozone layer depletion over Lithuania. It is also used in monitoring the ozone column and assessment of its quantitative changes.

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

Ozone and UV research activities are carried on at the Vilnius Gediminas Technical University and the Institute of Physics. In 2010, an estimation of the ground-level ozone lifetime under rural conditions was conducted (Lithuanian Journal of Physics, 50.2.247-254).



Total ozone fluctuation 1993–2011 (Station N 312, Kaunas)

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 UV-B measurement data from the Kaunas station have been sent to WOUDC and published in the "Ozone Data for the World" bulletin of the World Meteorological Organization's (WMO) and its Global Atmospheric Watch (GAW).

Projects and collaboration

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.

During the reporting period two seminars/trainings were conducted:

- in cooperation with the Customs Department, the Ministry of Environment conducted a training seminar for state institutions involved in enforcement activities. The Ministry of Environment delivered a lecture on the matter of environmental impact of ODS, relevant import/export control measures of ODS and ODS containing products and equipment, their implications.

- A seminar designated for industry on reporting on ODS and F-gases to the national institutions was conducted by the Environmental Protection Agency under the Ministry of Environment.

During 2010-2011 attention was paid to further improvement of the information which is placed on internet and is related to ODS issues as well as to ones of ODS containing products and equipment. It should be mentioned that in the late 2009 a new European Council and Parliament regulation on ozone depleting substances was adopted. In this connections the Ministry of Environment drafted the necessary legal acts which were adopted in 2010-2011. Therefore activities

on updating information on the website of the Ministry of Environment were undertaken. Several articles on implementation of the new ODS legislation were newly prepared or updated.

The following articles were newly added or updated in the light of new developments:

- new legislative requirements on ODS and ODS containing products and equipment;
- use of HCFC and HCFC containing equipment;
- information for enterprises which place on the market, purchase, use ODS for essential laboratory uses, on alternative analysis methods using non-ODS substances;

Information for importer and exporter of ODS and ODS containing products and equipment (including information on the European Union licensing system).

Population of Lithuania is informed about the level of UV radiation in Lithuania and risks related to it. In case of significant ozone layer depletion, 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 the 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 the State of the Environment annual reports issued by the Ministry of Environment of the Republic of Lithuania. The information is also published annually in "State of the Environment" Fact Sheets.

As an environmental and health indicator, each year as well as in 2010 and 2011, the Kaunas MS ultraviolet solar radiation data and their analysis were presented to the Health Education and Disease Prevention Centre under the Lithuanian Health Ministry.

In 2011, advisories and articles on the ozone issues were prepared:

May – an interview for Klaipeda Public Health Office Specialist J. Mažonas on the ozone layer and ultraviolet solar radiation implications for human health, published in the journal "Sveikas žmogus"; an interview about the importance of ozone layer for human health during the Lithuanian radio show "Ryto garsai". LHMS staff was delivered a report "Total ozone quantitative dynamics in 2010 and emergency situation in spring 2011".

October – LHMS website articles "Ozone layer variations and the ozone hole in the Northern Hemisphere" and "Ozone variations over Lithuania", interview with the "Lietuvos žinių" radio, the Baltic News Service (BNS) radio, and an article "Large ozone hole shifted to the east" in the newspaper "Lietuvos rytas" on 11 October 2011.

November – LHMS website article "Ozone layer variations" on the ozone hole over the Scandinavian peninsula, Baltic Sea and surrounding areas, interviews to DELFI portal and BNS radio.

On November 24 – a presentation on the ozone measurements was delivered at the Environmental Agency workshop on the ozone-depleting substances and fluorinated greenhouse gases data handling, collection and decontamination of contaminants, equipment stocktaking and reporting to public authorities.

December – LHMS website article "Ozone layer changes", communications of the ozone layer depletion over the Scandinavian peninsula, Baltic Sea, Lithuania and surrounding areas.