

SLOVENIA

Introduction

Under Article 3 (Research and systematic observation) of the Vienna Convention for the Protection of the Ozone Layer, the Parties have to initiate or co-operate in research and scientific assessment on protection of the ozone layer and adverse impacts on human health and environment. Annex I to the Convention contains a detailed list of the mayor scientific issues.

Every three years, the Ozone Research managers from all the Parties to the Convention meet to review the latest scientific findings on the state of the ozone layer and its reports are circulated to all Parties. The last meeting of the Ozone Research managers was organised in 1999.

Effects on human health and other biological effects of the ozone layer

An important tool for research on skin cancer is the cancer registry. Cancer Registry of Slovenia has been collecting and processing the data on cancer patients in Slovenia since 1950. This data base enables the running of national population-based registry on the incidence, prevalence and survival of cancer patients in Slovenia. The total number of all cases of cancer is still increasing. But the incidence of skin and malignant melanoma and few other cancers is increasing steeply in both sexes. Research data shows that skin cancer is prevailing. Several research projects were carried out. Some more detailed studies were performed on survival on malignant melanoma under EURO CARE project *Monitoring Cancer Patients' Survival in Europe* (Mrs. Vera Pompe-Kirn - national co-ordinator for Slovenia). More information can be found on <http://www.onko.si/Ang/ResearchProjects.html>.

The research on biological effects of UV-B radiation was conducted on the National Institute of Biology. The majority of work was done in the framework of the EC project *The role of UV-B radiation on aquatic and terrestrial ecosystems: an experimental and functional analysis of the evolution of protective and adaptive mechanisms in plants, Environment and Climate - PL 970637* from 1998-2001 (Mrs. Alenka Gaberščik - co-ordinator for Slovenia). The project was made in the co-operation with Lund University (Sweden), University of Erlangen (Germany) and Vrije University Amsterdam (the Netherlands). The Slovenian part of the project was estimated to 100.000 EUR. The research work is continuing in the framework of Ph.D. and Master thesis. The research includes long-term effects on growth parameters, some metabolic processes and biochemical properties of different plant species. For the purpose of the project UV-B, UV-A and photosynthetically active radiation has been monitored since 1999 using dosimeter ELDONET (European Light DOSimeter NETWORK).

Research into the physics of the atmosphere

No basic research was done in Slovenia in this field. There was some international co-operation in view of implementation. In 1999 the model for UV index forecast developed in DWD – Deutcher Wetterdienst in Offenbach, Germany was tested in Slovenia by Hydrometeorological Institute. The model with grid mash of 7 km x 7 km is covering Slovenia as well. Starting with 15 April 2000 the daily forecasts of UV index became available for public.

Systematic observations

Slovenia plays an active role in the Global Atmosphere Watch (GAW), the principal world program for air monitoring, coordinated by the World Meteorological Organization (WMO). Two Slovenian regional monitoring stations, Krvavec (1730 m a. s. l.) and Iskrba (550 m a. s. l.), contribute data to the GAW monitoring network. Within the framework of the GAW program, being of predominantly research nature, the chemical composition of the atmosphere was monitored and trends were recorded. Since the inclusion into the GAW program the following activities in connection with the ozone monitoring have been performed:

- Measurements of surface ozone
- Introduction of methods to ensure the quality of measurements

- Maintaining the traceability of the Slovenian reference standard for measurements of ground – level ozone to the primary standard
- Preparation for expanding the monitoring program to other components (meteorological parameters, CO, UV etc.).

The state institution responsible for monitoring is the Office for Monitoring inside the Environmental Agency of the Republic of Slovenia, <http://www.arso.gov.si/>. For ozone measurements, the Office for Monitoring is performing regular annual calibrations of its reference calibrator (Thermo Environmental Instruments, Model 49C-PS) against the regional GAW standard (NIST UV-Photometer SRP#17) at the Czech Hydrometeorological Institute (CHMI) in Prague, which is traceable to the primary GAW designated standard in Switzerland.

Alternative substances and technologies

In December 1997 the Decree on Handling Substances Depleting the Ozone Layer was adopted by the Government of Slovenia. The decree covers all ozone depleting substances and is written in accordance with the EU regulation No. 3093/94. It requires immediate phase out of CFC-s, halons, 1,1,1-trichloroethane, tetrachloromethane and HBFC, and it limits the use of HCFC and metilbromide. The phase out was successful and there was no need for additional research on alternative substances after 1999. The substitution of substances in existing systems, CFC-s in cooling and air-conditioning devices remained unsolved. In mid 2001 the Gorenje Company started the 50.000 EUR project to solve the problem. The project will be completed by the end of 2002.

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