

National Report of the Republic of Armenia
11th WMO/UNEP Ozone Research Managers Meeting
Geneva, 1-3 April 2020

1. OBSERVATIONAL ACTIVITIES

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

The Global Atmosphere Watch (GAW) regional meteorological station #410 in Amberd, Armenia, carries out regular measurements of total ozone since 2000. The station is equipped with the Dobson spectrophotometer D-044 (Fig.1). Location: 40.38N, 44.25E, 2070.

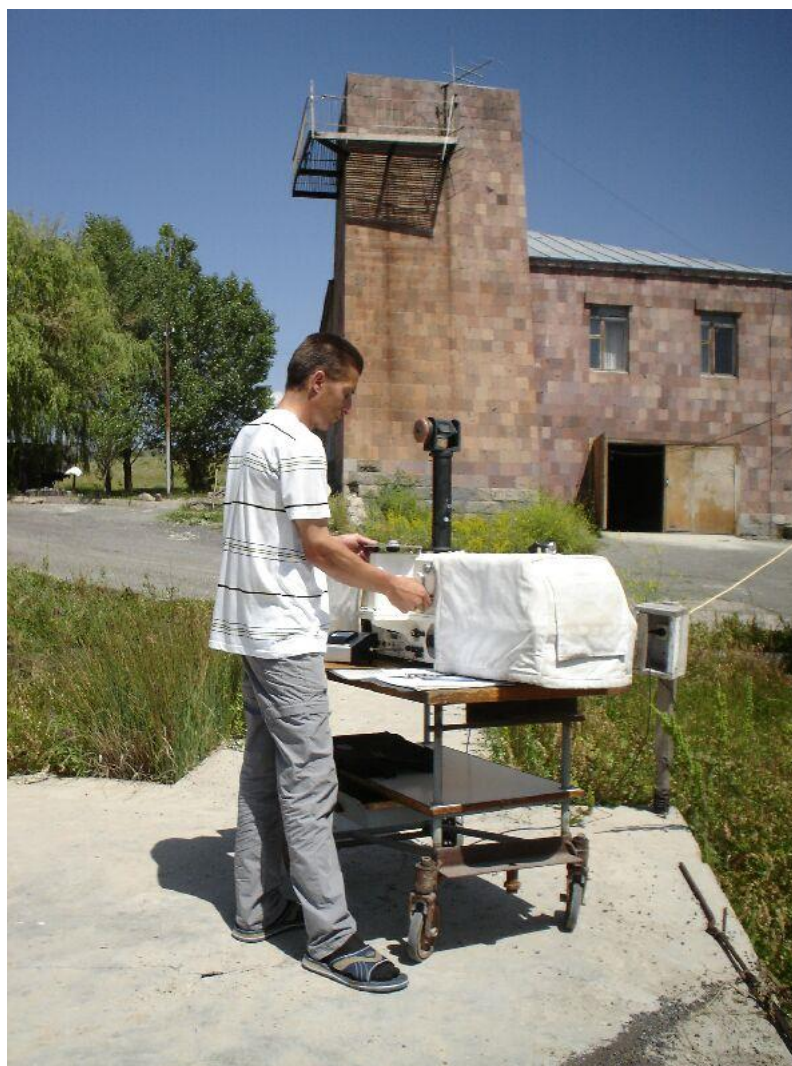


Figure 1: ***Dobson Spectrophotometer at the GAW Regional Station #410 Amberd***

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

No profile measurements of ozone and other gases/variables relevant to ozone loss are carried out in Armenia.

1.3 UV measurements

No UV measurements are currently carried out in Armenia due to the insufficient technical base (lack of equipment). It has been planned to equip the stations carrying out actinometric observations, with UV measuring equipment (radiometers) to carry out UV measurements in future (subject to funding availability).

1.4 Calibration activities

The calibration of Dobson spectrophotometer D-044 in European RDCC was held in Hohenpeisenberg in June 2017. Next calibration service of Dobson D-044 shall be organized in Hohenpeisenberg in 2023 (subject to funding availability).

2. RESULTS FROM OBSERVATIONS AND ANALYSIS

The results of measurements of total ozone at Dobson-station (Amberd) showed that during 2009-2019 the minimal value of total ozone was observed in 2010, and maximum values in 2016. These data can be interpreted as testifying about gradual recovery of ozone layer in middle latitudes of the Northern Hemisphere of the Earth.

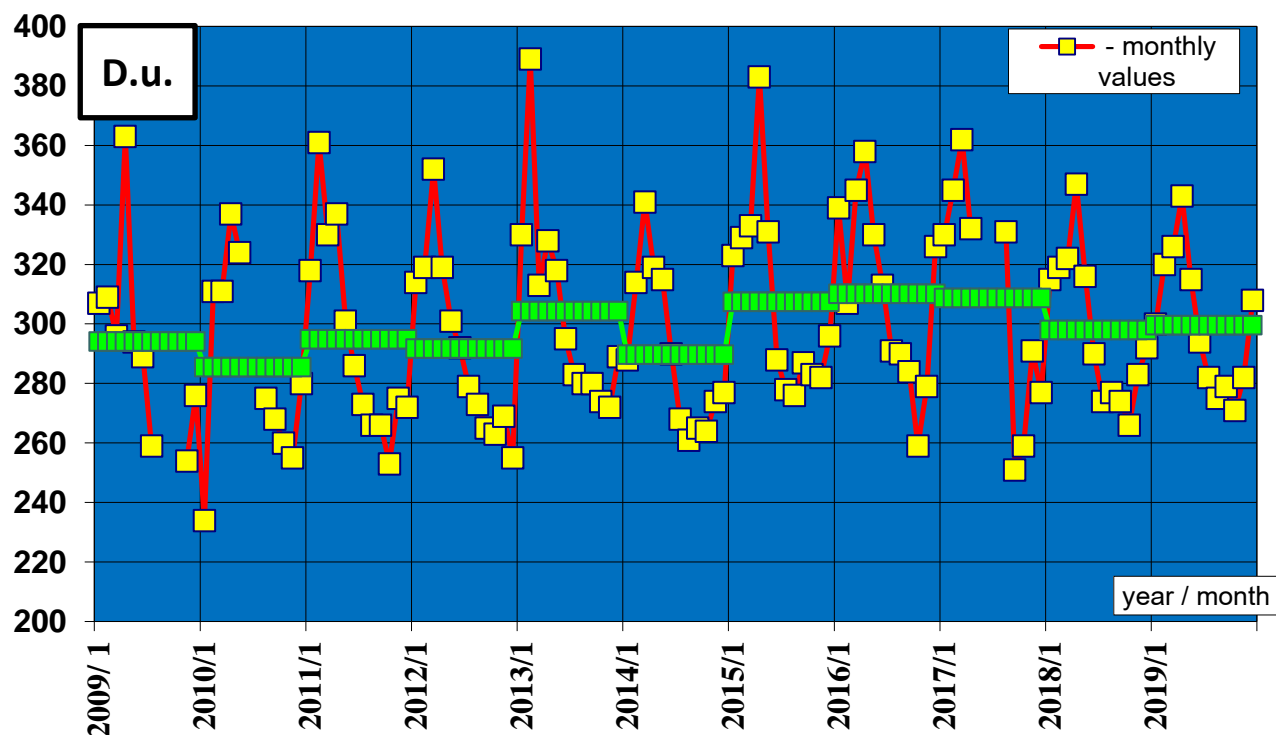


Table 1. *Dynamics of total ozone over Armenia during 2009-2019*

3. THEORY, MODELLING, AND OTHER OZONE RELATED RESEARCH

Research on the correlation of changes in the ozone layer and skin cancer rates was carried out for the period of 1990-1995 jointly with the National Center of Oncology: To update the research, a cooperation between the Ministry of Environment and the Ministry of Health of the Republic of Armenia was initiated by the end of 2019 based on the recommendations developed by the Stakeholder Consultation 2019. The actual research is planned for 2020.

4. DISSEMINATION OF RESULTS

4.1 Data reporting

Results of monthly measurements of total ozone at Amberd station are regularly submitted to the WMO/GAW, World Ozone and UV radiation Data Centre WOUDC as per the due procedure.

4.2 Information to the public

The model was developed to calculate intensity of solar radiation and distribution of UV Indexes using the forecasts of total ozone distribution above northern hemisphere from WMO/GAW ozone maps. The estimations and forecasts of UV Indexes for different regions of Armenia were calculated according to "UV Index for Public" (COST-713 Action UVB Forecasting) using local forecast of cloudiness. Forecasted and observed results are included in the daily hydrometeorological bulletin.

The Bulletin is submitted to decision makers as well as disseminated to public via internet, TV, and radio. Additionally, the bulletin including the map of Armenia with regional segments is uploaded to the new official website of the National Ozone Unit on a daily basis: www.saveozone.am . In case of high UV index a special warning is announced to avoid direct solar radiation.

Additionally, a short video was prepared jointly with the National Ozone Unit of Armenia (NOU) in September 2017 to present on the ozone layer observation activities in Armenia for wider public. The video is available on the official website of the NOU Armenia: <http://saveozone.am/post/ozonayin-sherti-ditarkovmner> .

Representatives of the Hydrometeorological Service of the Republic of Armenia regularly participate in the press conferences dedicated to the International Ozone Day organized by the NOU Armenia to reflect on the ozone layer observations in Armenia and current status of the ozone layer.

4.3 Relevant scientific papers

No new scientific papers have been developed during the reporting period.

5. PROJECTS, COLLABORATION, TWINNING AND CAPACITY BUILDING

Measurements on concentrations of pollution in precipitations and on solid particles in the air, including SO₂, NO₂ and surface ozone O₃ are continuously carried out at the Amberd Hydrometeorological station under the commitments of Long range Transboundary Air Pollution Convention ratified by the Republic of Armenia in 1997.

6. IMPLEMENTATION OF THE RECOMMENDATIONS OF THE 10th OZONE RESEARCH MANAGERS MEETING

- Existing observation capabilities for the ozone layer were duly maintained, and ozone measurements were accurately performed.
- Understanding the complex coupling of ozone, atmospheric chemistry, transport, and climate changes, and its high priority, ozone data were included in the Climate change projects in Armenia.
- Following the recommendation that maintaining long-term, research-quality observational data requires continued calibrations and intercomparisons, calibration of Dobson spectrophotometer D-044 in European RDCC was held in Hohenpeisenberg in June 2017.

7. NEEDS AND RECOMMENDATIONS

- Technical assistance is requested to allow UV measurements, and the Republic of Armenia would like to request the Ozone Secretariat to investigate the opportunities of providing technical assistance and procuring the UV measuring equipment.
- A training course at the WMO training centres for ozone experts is desirable.
- It is recommended to use the capacities of Amberd meteorological station in order to monitor solar radiation and vertical distribution of ozone.
- Bearing in mind that Amberd Ozone Measuring Station is unique and the only one in the region, it is recommended to equip the station with the Brewer spectrophotometer to carry parallel measurements with the Dobson spectrophotometer until the latter one is transferred to another country wishing to initiate ozone measurement.
- Based on the recommendations of the Stakeholder Consultation 2019, it has been planned to initiate ozone measurements through satellite borne instruments including Sentinel-2.