



Evaluation of data quality of precipitation chemistry monitoring in Russia with help of international QA/QC project

Sergey A. Gromov (1,2), Elizaveta S. Konkova (1), Alexandra S. Konkova (1), and Irina M. Bruskina (1)

(1) Institute of Global Climate and Ecology Roshydromet & RAS, Environmental Pollution Monitoring Division, Moscow, Russian Federation (sergey.gromov@igce.ru), (2) Institute of Geography RAS, Moscow

Quality assurance and precision of analytical data are the key requirements for environmental background pollution information as declared by all international monitoring networks. Most of them have organized regular inter-comparison projects among the laboratories that participate in coordinated monitoring activities or established networks (EMEP, 2017; EANET, 2017; WMO, 2017). Their results are available at network information sites or through periodic publications (Gromov et al., 2016) and considered as proper control of the data representativeness.

As of 2017, there are several precipitation chemistry networks (PCNs) operating under national and international monitoring programs over the Russian territory which provide data that is subject to harmonization and verification. The spatial extent of these networks is broad: from the western regions of European Russia to the Asian Far East, and from the Arctic to the extremely long southern border.

In order to operate the network and analyse samples, a number of regional laboratories were set-up together with analytical centres of international programs. Five of the laboratories provide monitoring data for common international databases and hence are involved in the laboratory inter-comparison studies (LIS) organized by QA/SAC-Americas within the WMO Global Atmosphere Watch (GAW) program. LIS is conducted semi-annually by analysing artificial “rain water” samples for all recommended substances in every laboratory (WMO, 2017).

In this study, we analyse the LIS results of the Russian PCN laboratories for the 2010–2017 period in order to evaluate their operational level and progress. A number of criteria were used for the assessment of experimental results for each laboratory: accuracy (difference between the expected and reported values), precision (range of statistical variability) and their stability (trends) over the period of investigation. The evaluation results are summarized in tables and graphs separately according to different ranges of prepared concentrations. The correspondence to the Data Quality Objectives (GAW, 2004) is also checked along the statistical evaluation of the laboratories’ LIS performance.

References

EANET, 2017. Report of the Inter-laboratory Comparison Projects 2016. Network Center for EANET, November 2017.

EMEP, 2017. EMEP laboratory intercomparison. <https://www.nilu.no/projects/ccc/intercomparison/index.html>

GAW, 2004. Manual for the GAW Precipitation Chemistry Programme. WMO-GAW No 160.

Gromov S., Yamashita K., Sato K., Sase H., Trifonova-Yakovleva A., 2016. Chapter 2 Data Quality. In: The Third Periodic Report on the State of Acid Deposition in East Asia. Part I: Regional Assessment. EANET ACAP, 15-44, December 2016.

WMO, 2017. LIS 57 Study Summary. Quality Assurance/Science Activity Centre – Americas, <http://www.qasac-americas.org/lis/summary/57>.