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# Activity Report of the Slovenian Environment Agency in the field of Meteorology and Hydrology

### GENERAL INFORMATION

Slovenian Environment Agency (ARSO) is a body of the Ministry of Environment and Spatial Planning. It consists of five offices: Environmental Measurement Office, Meteorology and Hydrology Office, State of the Environment Office, Seismology Office, and Environment and Nature Protection Office. Since June 2019, ARSO has a new acting director general, Mrs. Lilijana Kozlović.

Budget of ARSO for 2018 was 20.3 M€, and for 2019 21.6 M€. At the end of 2018 ARSO had 361 (318 permanent) employees, 92 in the Meteorology and Hydrology Office and 72 in Environmental Measurement Office. The number of staff has increased in the last year due to the new employments for European projects and value-added services.

The Act on National Meteorological, Hydrological, Oceanographic, and Seismological Service defines the tasks of the national service for all four areas. It provides legal background for protection of the service's infrastructure, designates the service as single authoritative voice for warnings on the territory of the Republic of Slovenia, and allows the service to provide value-added products and services for specialised users and use revenues to engage additional staff. ARSO is responsible for the national service, meteorological and hydrological tasks are performed together by its Environmental Measurement Office and Meteorology and Hydrology Office, supported by the common IT, Financial, Human Resources, and Legal Services. Based on the special agreement between Ministry of Environment and Spatial Planning and Ministry of Defence, ARSO provides also meteorological, hydrological and oceanographic support for the Slovenian Military Service.

Aviation Meteorology Service is a part of ARSO official duty. ARSO is a Certified Meteorological Service Provider according to the Single European Sky legislation, in particular Regulation (EC) N°550/2004 on the provision of air navigation services and Commission Regulation (EC) N°2096/2005. Currently we are facing a major challenge being compliant with the Commission Implementing Regulation (EU) 2017/373 that will enter into force on 2 January 2020.

ARSO operates 120 automatic weather stations, 180 automatic surface water stations, 45 automatic groundwater stations, 20 automatic air quality stations, 2 radars and 1 radiosonde station. Following the change of the Slovenian Public Information Access Act at the end of 2015, ARSO adopted open data policy in the beginning of 2018. Currently we are in the transition phase of our free data user services.

The Calibration Laboratory of ARSO is accredited according to the ISO/IEC/SIST 17025 for temperature, barometric pressure, relative humidity and air quality quantities calibration: CO, SO<sub>2</sub>, NO<sub>x</sub> and ozone. Since 2005, the laboratory is recognized as a WMO Regional Instrument Centre (RIC) in RA VI, focused to the SE Europe. This year we hosted calibration experts from Hungarian (OMSZ)

and Israeli Meteorological Service (ISM), provided calibration of some reference instruments to Israeli (ISM), Serbian (RHMZS) and Moroccan (Maroc Meteo) Meteorological Services, and delivered calibration training in Oman (Directorate General of Meteorology in Oman). For November, exchange of experience with Slovak WMO RIC is planned.

Since 2006, ARSO is hosting the Drought Management Centre for Southeastern Europe (DMCSEE), initiated by the WMO, UNCCD and 13 countries in the region. In September 2019, we finished a European project on the drought risk reduction in Danube Region (DriDanube). Together with the partners from Alpine region, we successfully applied for the new European project on Alpine Drought Observatory (ADO) extending and upgrading some results of DriDanube project to Alps. The project just started.

From the very beginning, ARSO actively supported the initiative of the International Sava River Basin Commission (ISRBC) setting up the System for Flood Forecasting and Warning in the Sava River Basin (Sava FFWS). After the conclusion of the project in autumn 2018, the ARSO took responsibility for hosting the primary operational system.

Republic of Slovenia is a member state of WMO, EUMETSAT and ECMWF, and cooperating state of ESA. Republic of Slovenia is also a member of the International Sava River Basin Commission. ARSO is a co-founder of the EUMETNET-EIG and a member of the ECOMET E.I.G. In addition, ARSO is an active member of the ALADIN consortium and its sub-regional grouping of RC-LACE, as well as member of EUROGOOS (European Global Ocean Observing System). It has bilateral cooperation agreements with the following national or regional meteorological and hydrological services:

- DHMZ (Croatian National Hydrometeorological Institute),
- ZAMG (Austrian Central Office for Meteorology and Geodynamics),
- OMSZ (Hungarian National Meteorological Service),
- ARPA FVG (Agency for Environment Protection in Friuli Venezia Giulia, Italy),
- Protezione Civile FVG (Civil Protection Authority in Friuli Venezia Giulia),
- Federal Hydrometeorological Institute of Bosna and Herzegovina and Hydrometeorological Service of the Republic of Srpska.

In May 2019 ARSO and WMO signed Memorandum of Understanding as the basis of ARSO's active role in the WMO projects, especially those in South-East Europe.

## PROJECTS

Besides an active role in several ICAO, WMO, COST and EUMETNET initiatives and programs, ARSO runs several European and internal projects, as well as other developmental activities to improve its performance.

In July 2016, we finished a large EU cohesion project "*Upgrade of the System for Monitoring and Analysing of the Water Environment in Slovenia - BOBER*" (details already reported in previous ICSEED reports).

Since February 2016, we are running a EU cohesion project "*Upgrade of the System for Monitoring Air Quality, Estimating the Main Causes and Analysing the Effects of Measures to Reduce Air Pollution in Slovenia - SINICA*". The project is worth 6.3 M€, 85% financed from European Cohesion Funds, 15% from Slovenian Government. The project includes:

- Update of emission inventories and development of emission scenarios for Slovenia
- Upgrade of air quality measuring network in Slovenia
- Upgrade of existing dispersion model and development/instalment of urban scale model
- Upgrade of receptor modelling system

In March 2016, we started a project "*Climate Change Scenarios for Slovenia until 2100*", considering changes in mean values and extremes (heat waves, droughts, floods, etc.). The results of this project present the basis for Climate Adaptation Strategy for Slovenia. The project is funded by the Slovenian Climate Fund.

In the last two years, we were more than 40% successful with applications to different EU Programme Calls. Active European projects in 2018 and 2019, related to meteorology and hydrology, are as follows:

- *DriDanube* - Drought Risk in Danube region (leading partner), January 2017 – September 2019, *INTERREG Danube Transnational Programme*
- *prepAIR* - Po Region Engaged to Policies of Air, February 2017 – January 2024, *LIFE IP Programme – Italy*
- *eGAFOR* - Electronic General Aviation Forecasts, June 2017 – December 2020, *Connecting Europe Facility Programme*
- *I-STROMS* - Integrated Sea Storm Management Strategies, January 2018 – December 2019, *INTERREG Adrion Programme*
- *FRISCO1* - Cross-Border Harmonized Slovenian-Croatian Flood Risk Reduction 1 – Non Structural Measures, April 2016 – April 2019, *INTERREG Slovenia - Croatia Programme*
- *CROSSRISK* - Public warnings - reducing rain and snowfall related risks, June 2018 – May 2021, *INTERREG Slovenia - Austria Programme*
- *goMURa* - Cross-border plan for innovative sustainable management of the border Mura river and improved management of flood risk, June 2018 – May 2021, *INTERREG Slovenia – Austria Programme*
- *VISFRIM* - Efficient Flood Risk Management for Vipava river and other cross-border rivers, January 2019 – December 2022, *INTERREG Slovenia – Italia Programme*

In March 2017 ARSO also joined the *EUMETSAT Land Surface Analysing SAF consortium*, led by the Portuguese Institute for Sea and Atmosphere.

In July 2019 ARSO and WMO signed the Implementing Arrangements, defining ARSO's active role in the WMO project "South-East European Multi-Hazard Early Warning Advisory System - SEE-MHEWS-A". The task of the ARSO is to:

- Develop semi-operational NWP ALADIN system in 2.5 km resolution for the entire South-East Europe for implementation at the ECMWF infrastructure and in EcFlow supervision system.
- Prepare methodology for post-processing of the results of the RC-LACE 5 km Ensemble Prediction System LAEF for SEE-MHEWS-A region to be used as input for hydrological models.
- Design a software interface between the NWP model grids and selected hydrological model grids that will enable using ALADIN outputs as input to hydrological models.

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