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**EU4Environment**  
Water and Data in Eastern Partner Countries

EU4Environment in Eastern Partner Countries:  
Water Resources and Environmental Data (ENI/2021/425-550)

## TRAINING REPORT

### DATA TRAINING, ARMENIA AND GEORGIA

**Date:**  
**21-22 May 2024**

**Mission Lead:**  
*Umweltbundesamt*  
**Workshop Lead:**  
*DWS Hydro-Ökologie*

**Output/Activity n°:**  
**1.4**

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*Date*  
9 September 2024

Implementing partners



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**SUBJECT:** Data training

**VENUE:** 21 May 2024 Environment Agency Austria (Umweltbundesamt GmbH)  
Brigittenauer Lände 50-54, 1090 Vienna  
22 May 2024 DWS Hydro-Ökologie GmbH Margaretenstrasse 85, 1050 Vienna

**AGENDA:** in Annex 5.1

**PARTICIPANTS:**

Armenian Experts

<i>Institution</i>	<i>Name</i>	<i>Function / Position</i>
HMC	Vardan Karyan	Head of Soil, Sediment and Hydrobiology Monitoring Service
HMC	Liana Vardumyan	Head of Surface Water Quality Monitoring Service
HMC	Tigran Arakelyan	Head of Surface Water Quality Field Research and Sampling
HMC	Ani Ayvazyan	Quality Control Manager of SW Quality Monitoring Service

Georgian Experts

<i>Institution</i>	<i>Name</i>	<i>Function / Position</i>
NEA	Lia Aptsiauri	Head of Laboratory, Chemist
NEA	Ana Gabrichidze	Hydrobiologist
NEA	Nino Khelashvili	Chemist
NEA	Nino Vasadze	Chemist

Austrian Experts

<i>Institution</i>	<i>Name</i>	<i>Function / Position</i>
Umweltbundesamt	Daniel Trauner	EU4WD Surface Water Lead
DWS Hydro-Ökologie	Georg Wolfram	SW Expert, CEO of DWS Hydro-Ökologie

**DOCUMENTS:** Presentations were shared with the participants.

## 1. Objective(s) and scope of the workshop / training

This training aims to achieve the following objectives, outputs, and outcomes:

- Gain a thorough understanding of the EU Water Framework Directive and its relevance to water quality and environmental monitoring.
- Acquire knowledge of key parameters, methods, and sampling techniques in connection to quality assurance and data quality in water quality assessment within the WFD framework.
- Develop proficiency in data analysis techniques, statistical tools, and software applications for effective evaluation and interpretation of water quality data.
- Enhance skills in identifying trends, anomalies, and compliance with WFD standards through data analysis.
- Improve the ability to communicate data analysis results effectively through data visualization techniques.

## 2. Main results

### 2.1. Data training and EU Water Framework Directive

*The significance of data in the implementation of the EU WFD was presented and discussed. The participants understand that correct and accessible data is crucial to successfully implement the EU acquis on aquatic ecology, water quality, and water protection in their countries.*

### 2.2. Key parameters, methods, techniques

*The relevant chemical and biological parameters and elements to assess the ecological and chemical status were presented. The methods and techniques were briefly discussed, mainly in view of their relevance for data quality assurance. Based on the presentation, the trainees understand the accuracy, precision, and carefulness are important when applying methods and techniques in the field, in the lab and during the data analysis.*

### 2.3. Proficiency in data analysis

*Different data analysis techniques were presented and tested during the training, starting with simple applications in MS Excel and continuing with PAST and R to show more sophisticated statistical techniques. Especially the easily accessible and simple statistical software program PAST was used intensively. At the end of the training, the participants know how to basically apply uni- and bivariate analysis in R. For multivariate techniques, more basic statistical knowledge it required, but the trainees at least have learned the basis approach and use of these techniques.*

### 2.4. Skills in identifying trends and anomalies

*Data checks are crucial before entering data analysis. During the training, several ways of checking data were explained to identify trends and anomalies but also to eliminate data flaws and outliers. To enable this step, templates were prepared which could be used by the participants during the training. All templates were provided also to the participants to allow them repeating the tests and checks at home.*

### 2.5. Visualization

*Various examples were shown to highlight the importance of data visualization but also to stress possible pitfalls when applying wrong or inadequate visualization techniques. One of the EU4ENV monitoring report was used to discuss good and mediocre examples of data graphs. Besides, additional options to visualize the results of monitoring were shown. The participants return home with enhanced awareness of options and risks of bad data visualization and the potential of good plotting data for communication to the public as well as to the politics.*

### 3. Next steps / recommendations

It is recommended to provide a detailed course on MS Excel in the near future.

### 4. Follow-up dates

No further follow-up data planned within this project

### 5. Annexes

#### 5.1. Agenda

See separate file: Annex\_1\_21-22\_May\_2024.pdf

#### 5.2. Photos showing the venue and work of the speakers / trainers and participants

