

Question and Answer (Q&A) Guide

Homogenization Presentation

WMO/SERCOM/SC-CS/ET-DDS November 2025

1. Challenging Questions

Q1: Does homogenization methods consider the rapid climate change?

A: Absolute homogenization would consider rapid changes in climate series due to climate change as inhomogeneities. That is why relative homogenization should be applied, where only changes alien to the climate signal will be detected and corrected.

Q2: Is Artificial Intelligence (AI) is used for homogenization?

A: There are current efforts to explore the application of AI to homogenization, this is a field that is in its early stages.

Q3: Can homogenization introduce bias?

A: When done incorrectly, yes. That's why strict methodology, transparency, and documentation are crucial. Using multiple statistical methods and reference series reduces risk.

Q4: How do you justify adjusting historical data to skeptical audiences?

A: Explain that adjustments remove **artifacts**, not real climate signals. Show examples where unadjusted data would misrepresent trends, and demonstrate validation against reference series.

Q5: How do you handle stations with very short or inconsistent records?

A: Short or inconsistent records can still be useful in regional analyses. We document uncertainty clearly and use them cautiously in homogenization, often cross-checking with neighboring stations.

Q6: What is the WMO Data Policy for homogenized data?

A: There is no specific rule for homogenised data in the WMO data policy. Homogenised (climate) data fall under climate data as such and the WMO data policy defines historic time series data needed to describe the climate as core data (basically focusing on ECVs), which shall be exchanged on a free and unrestricted basis (with a tentative maximum delay of one year).

Q7: Do we need the same homogenized process (method) for a regional approach? That means for a RCC to ask each RCC's Members the same homogenized method to be able to gather all datasets together?

A: It would add the plus of consistent methodology, but it is not strictly necessary.

2. General / Conceptual Questions

Q1: What exactly is homogenization?

A: Homogenization is the process of adjusting climate data to remove errors caused by changes in instruments, station locations, or observation practices. It ensures that observed trends reflect **true climate variations**, not artificial shifts.

Q2: Why is it necessary?

A: Without homogenization, we risk misinterpreting climate trends. It's essential for research, climate services, and decision-making in sectors like energy, health, and agriculture.

Q3: How often should homogenization be done?

A: Homogenization is an ongoing process. Datasets should be updated regularly as new observations come in or as old data are rescued or re-evaluated. While the first homogenization of a dataset may be time consuming, due to the election of the method, preparation of the input data and the execution of exploratory runs until successful results are obtained, subsequent homogenizations of the same dataset will be much easier, especially if the process is implemented in an automatic script.

3. Technical / Implementation Questions

Q1: What timescales are typically homogenized?

A: Monthly, daily, and sub-daily timescales. The choice depends on data availability and the intended applications.

Q2: How do you handle gaps in historical data?

A: Through **data rescue**, interpolation, statistical methods, models. Metadata and documentation are crucial to ensure transparency.

Q3: Are there standard software tools for homogenization?

A: Yes. For example, ACMANT, Climatol, MASH, RHTEST and other WMO-recommended packages. The choice depends on national capacity and dataset specifics.

Q4: How do you assess the quality of homogenized datasets?

A: By assigning **quality levels**, validating against reference series, and documenting all adjustments made. Continuous feedback from users is also important.

4. Organizational / Strategic Questions

Q1: What are the key prerequisites before starting homogenization?

A: Strong governance, compliance with **WMO standards**, knowledge of datasets (metadata, QC, rescued data), and a clear vision aligned with national and global priorities.

Q2: How much resources are typically needed?

A: It depends on the dataset size and scope. You need trained staff, technical infrastructure (hardware/software), and sustainable funding. Even small teams can start and gradually scale up.

Q3: How do you ensure the process is sustainable?

A: Through a structured plan, clear responsibilities, staff training, secure data storage, and regular updates. Collaboration at regional and global levels also helps.

5. User / Impact Questions

Q1: How does homogenization benefit sectors like agriculture or energy?

A: Homogenized data provide reliable long-term climate records, enabling **better planning** — for example, irrigation schedules, crop selection, energy demand forecasting, or flood risk assessment.

Q2: How do you communicate with users?

A: Through webinars, workshops, forums, or direct feedback channels. This ensures datasets meet users' needs and builds trust.
