

StatE0

5-7 May 2026 | ESA-ESRIN | Frascati (Rome), Italy



Workshop 5: Trust and Uncertainty



Trust in EO information products is a fundamental condition for their uptake in official statistics

While EO offers unprecedented opportunities (global coverage, consistency, and timeliness), EO also introduces **new challenges** related to **transparency**, **uncertainty**, and **alignment with established statistical frameworks**.

The workshop will explore how transparency, methodological robustness, and uncertainty quantification can strengthen confidence and trust in EO-derived information.

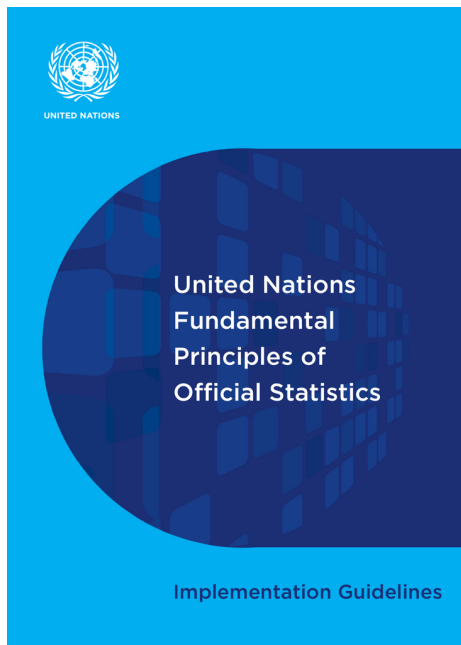
Workshop Question: What factors build or erode trust in EO data when used in official statistics?

- How can we ensure **transparency and reproducibility** of EO workflows?
- How should **uncertainty** be quantified and communicated?
- What are the **best practices for metadata and documentation** ?
- Which **frameworks for data quality assessment** are needed?

Expected Workshop Outputs:

Identify practical approaches to ensure that EO information products are not only scientifically robust, but also trusted, accepted, and usable within official statistical frameworks.

Alignment with established statistical frameworks



The UN Fundamental Principles of Official Statistics is a global framework that ensure that statistics are produced **independently**, using **sound methods**, and are **transparent, reliable**, and **comparable** for informed decision-making.

UN Fundamental Principles of Official Statistics



Discussions on Trust and Uncertainty need to be closely aligned with the United Nations Fundamental Principles of Official Statistics.

Application of the Fundamental Principles of Official Statistics to the use of EO information products

- **Principle 1 – Relevance & Impartiality**
👉 *“Do EO-derived statistics meet user needs and are they unbiased?”*
- **Principle 2 – Professional standards & Scientific rigor**
👉 *“Are EO-derived statistical methods scientifically sound and properly validated?”*
- **Principle 3 – Accountability & Transparency**
👉 *“Can we understand and reproduce the EO-derived statistics ?”*
- **Principle 4 – Prevention of Misuse**
👉 *“Are EO-derived statistics correctly interpreted, and are uncertainties clearly communicated to avoid misuse?”*
- **Principle 5 – Source of official data**
👉 *“Are EO-derived statistics well-documented and of sufficient quality for statistical use”*
- **Principle 8 – National coordination**
👉 *“Are EO-derived statistics aligned with national statistical systems and consistent with existing official data?”*
- **Principle 9 – International Standards**
👉 *“Are EO-derived statistics comparable across countries?”*

Code of practices of European Statistics



1 Professional Independence
European statistics are produced in an impartial and independent manner, free from any political or other external influence.

1 bis Coordination and Cooperation
National Statistical Institutes and Eurostat work together to coordinate the production of European statistics and to further cooperate at both national and European levels.

2 Mandate for Data Collection and Access to Data
Statistical authorities have access to the data necessary to produce European statistics.

3 Adequacy of Resources
Human, financial and technical resources are sufficient to produce high quality European statistics.

4 Commitment to Quality
Statistical authorities regularly and systematically review their processes and the quality of their statistical products.

5 Statistical Confidentiality and Data Protection
The privacy of data providers and the confidentiality of the information they provide is guaranteed by law.

6 Impartiality and Objectivity
European statistics are developed, produced and published in a professional and transparent manner, treating all users fairly and equally.

7 Sound Methodology
European statistics have a sound methodological basis and are in line with European and international standards.

8 Appropriate Statistical Procedures
Statistical processes are routinely monitored and revised using well-established, transparent procedures.

9 Non-excessive Burden on Respondents
Statistical authorities request information from respondents only when it is necessary.

10 Cost Effectiveness
Statistical authorities ensure that they use resources efficiently.

11 Relevance
European statistics are based on user needs.

12 Accuracy and Reliability
European statistics accurately and reliably portray reality.

13 Timeliness and Punctuality
European statistics are released in a timely and punctual way.

14 Coherence and Comparability
European statistics are consistent and comparable between regions and countries over time.

15 Accessibility and Clarity
European statistics are published in a clear and easily-accessible way.

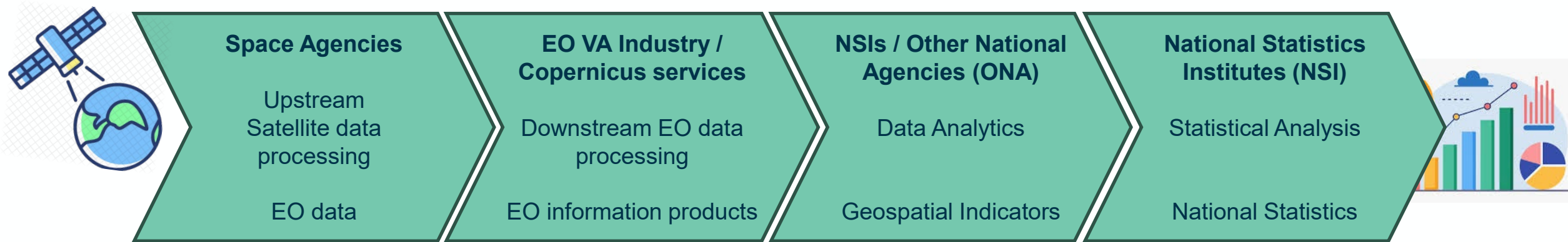
The **European Statistics Code of Practice (CoP)** is the quality framework of the European Statistical System that sets out the principles and standards for producing and disseminating European statistics.

- | | | |
|---------------------|-----------------------|--------------------|
| Relevance | Independence | Objectivity |
| Accountability | Confidentiality | Sound Methodology |
| Timeliness | Clarity | Comparability |
| Accuracy | Reliability | Accessibility |
| No Excessive Burden | Adequacy of Resources | Cost Effectiveness |

Value Chain from satellite data to statistics production



To better understand where trust is built - or potentially eroded - it is essential to look at the **end-to-end value chain**, from satellite observations to the production of official statistics.



- Rigorous calibration and validation (cal/val)
- Well-documented uncertainty budgets
- Long-term consistency and stability of missions

- Reproducible algorithms and workflows
- Clear methodological documentation (ATBDs)
- Transparent handling of model assumptions and uncertainties

- Clear definitions and methodologies
- Integration of different data sources with their inherent uncertainties
- Consistency with statistical frameworks

- Statistical rigor and validation
- Integration with traditional data sources
- Clear communication of uncertainties and limitations

Uncertainty

Metadata

Long Term Sustainability

FAIR principles

Transparency

Reproducibility

