

2026 CEOS-ARD Strategy

Version 0.0
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Earth Observation for Everyone

DRAFT CEOS-ARD Strategy 2026-2031

Background

The CEOS-ARD Oversight Group is tasked with maintaining a high-level strategy for CEOS-ARD development. In 2025, CEOS undertook a community engagement campaign to connect with satellite data producers and users – particularly those outside of CEOS – to help us understand exactly how CEOS-ARD needs to evolve.

The overarching questions posed to the community were:

- *Where are the opportunities to make CEOS-ARD better?*
- *How can we make CEOS-ARD more effective and impactful?*

The CEOS-ARD team compiled its findings into a [consultation paper](#) and was subsequently tasked by the 2025 CEOS Plenary to produce an updated CEOS-ARD Strategy for 2026.

Guiding principles in developing the 2026 CEOS-ARD Strategy are:

- “Earth Observation for Everyone”
- Enabling users to address their questions significantly faster.

Overall, CEOS-ARD will be effective and impactful when it is trusted, interoperable, scalable, and indispensable — supporting science discovery and applications, operations, markets, and AI with clear evidence of fitness, quality, and impact.

Future of CEOS-ARD Themes

The 2025 [Future of CEOS-ARD concept note](#) identified 14 priority areas for further development:

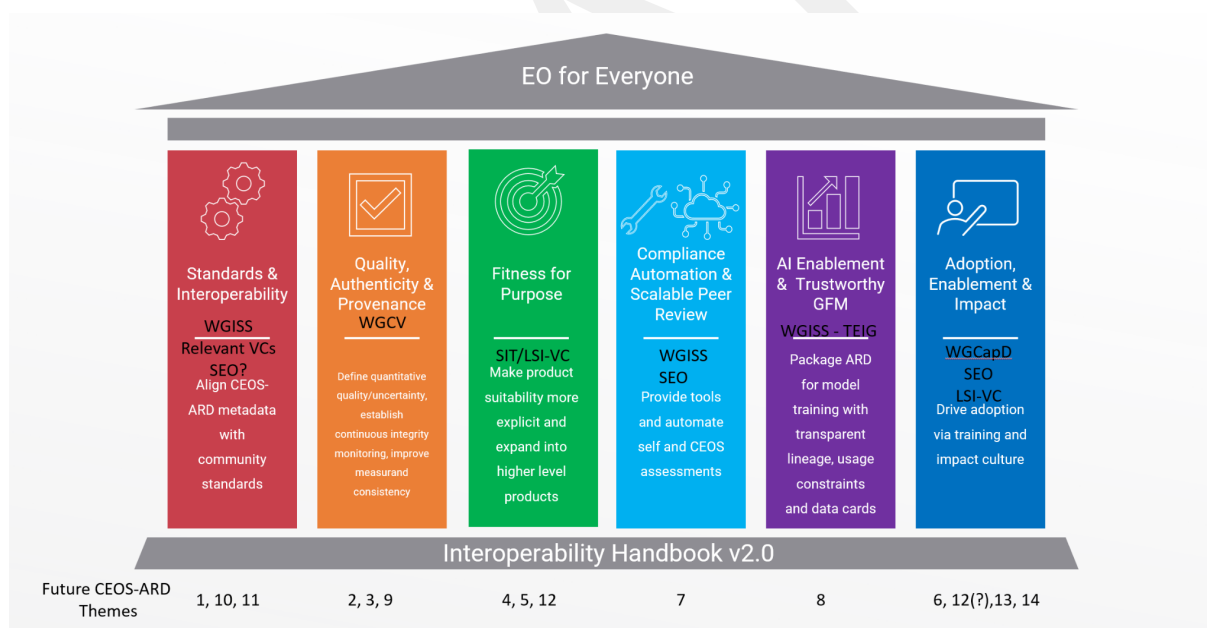
1. Consistent and Enhanced Metadata Specifications
2. Data and Metadata Quality
3. Ongoing Quality Assurance and Integrity Monitoring
4. Fitness for Purpose
5. Increased Support to Scientific Applications and Environmental Adaptation and Resilience
6. Solidifying the Business Case and Increasing Commercial Relevance
7. Tools to Aid Compliance Assessments and Peer Reviews
8. Supporting Opportunities and Reducing Risks Related to AI
9. Measurand Consistency and Algorithm / Application Resilience
10. Alignment with the Software Ecosystem
11. Analysis Ready Data Standards
12. Thematic and Higher level CEOS- ARD Products
13. Training and Outreach
14. Capturing Use and Impact

Strategic Pillars

In order for CEOS-ARD to be more impactful and more broadly adopted, we propose future work to be categorised under six strategic pillars as follows:

1. **Standards and Interoperability** where CEOS-ARD datasets work seamlessly across mainstream geospatial tools and platforms.
2. **Quality, Authenticity & Provenance** where trust in the CEOS-ARD label is based on evidence.
3. **Fitness for Purpose** where all users of Earth observation select CEOS-ARD products with confidence.
4. **Compliance Automation & Scalable Peer Review** where CEOS-ARD can scale while maintaining rigour and integrity.
5. **AI Enablement & Trustworthy Geospatial Foundation Models (GFM)** where CEOS-ARD is referenced as a trusted and high quality baseline for AI research and operational deployment.
6. **Adoption, Enablement & Impact** where CEOS-ARD success is measured by use and impact.

These pillars encompass the 14 themes from the 2025 concept note. The Strategy is underpinned by the principles of the [CEOS Interoperability Handbook 2.0](#), which was endorsed by CEOS in 2025.



1: Standards and Interoperability

Focus on ensuring CEOS-ARD metadata and data structures are interoperable across existing global standards.

Success Criteria:

- CEOS-ARD metadata is **consistently implemented across all Product Family Specifications**, with a STAC-first, machine-readable and human-interpretable specification supported by OGC/ISO crosswalks.
- CEOS-ARD data and metadata are **natively understood by mainstream software tools** (e.g., GDAL, QGIS, ArcGIS, cloud catalogues) without custom adapters.
- CEOS-ARD is recognised as the **de facto global community standard for satellite Analysis Ready Data**, with a clear, endorsed roadmap toward formal standardisation.
- Agencies, commercial providers, and distributors treat CEOS-ARD requirements as **default interoperability baselines**, not bespoke CEOS artifacts.

Outcome Signal: CEOS ARD datasets work seamlessly across mainstream geospatial tools and cloud-based processing environments. This means:

- CEOS-ARD metadata and data **work out-of-the-box** in mainstream tools and cloud workflows.
- Users don't need custom scripts or manual schema mappings to use CEOS-ARD.
- CEOS-ARD is seen as **ready-to-use**.

2: Quality, Authenticity & Provenance

Addresses the need for measurable, transparent, and continuously verifiable data quality.

Success Criteria:

- CEOS-ARD products are accompanied by **quantitative, consistent, and comparable quality and uncertainty information**, not just descriptive compliance statements.
- **Ongoing integrity monitoring and reporting** is routine, enabling early detection of degradation or loss of compliance. *Note: Integrity means continuous, verifiable confidence that CEOS-ARD data remains accurate, consistent, authentic, and traceable across its entire lifecycle.*
- **Provenance, authenticity, versioning, and lineage of data** are machine-readable and human-interpretable, and traceable across all mirrors, cloud platforms, and reprocessing cycles.
- If a user is building a time series or multi-mission analysis, they can swap or mix CEOS-ARD products with **no hidden biases or artifacts** being introduced.
- The CEOS-ARD label guarantees **harmonized measurands, within specified uncertainties** (note: not homogenised).

Outcome signal: Trust in the CEOS-ARD label is based on evidence.

3: Fitness for Purpose

CEOS-ARD products are clearly classified for their suitability across different applications, supporting both non-expert users and scientific communities.

Success Criteria:

- Users can clearly identify **what each CEOS-ARD product is fit for**, including limitations, uncertainty bounds, and appropriate application types.
- CEOS-ARD supports **long-term, stable, bias-aware data records** suitable for long-term scientific applications.
- Fitness-for-purpose distinctions help **non-expert users avoid misuse**, while giving providers clear pathways to improve product maturity.
- CEOS-ARD products are increasingly cited as **authoritative inputs** to global frameworks, indicators, and assessments.

Outcome Signal: Users can select CEOS-ARD products with confidence.

4: Compliance Automation & Scalable Peer Review

Reducing the burden of compliance assessments for data providers and assessors, enabling CEOS-ARD to scale across a growing number of providers.

Success Criteria:

- CEOS-ARD **assessments are largely automated**, repeatable, continuous, and embedded in provider pipelines.
- Peer review scales sustainably without relying on manual document checks.
- Providers experience **lower effort and faster turnaround** for CEOS-ARD endorsement.
- CEOS-ARD governance shifts from gatekeeping to **continuous assurance**.
- Contribute to commercial ecosystem enhancement by enabling independent third parties to undertake compliance assessments.

Outcome Signal: CEOS-ARD can scale to many more providers without slowing down and third parties emerge to provide commercial compliance services.

5: AI Enablement & Trustworthy GFM

Position CEOS-ARD as the gold standard for AI applications, including Geospatial Foundation Models (GFMs).

Success Criteria:

- CEOS-ARD products are widely used as **trusted training and benchmarking data** for geospatial AI and foundation models.
- CEOS-ARD defines product specifications for GFM-derived products, including embeddings, ensuring they carry the same quality and provenance guarantees as the source data.
- AI users understand dataset limitations through **clear provenance, uncertainty information, and data cards¹**.

¹ A data card is a transparency artifact that documents key facts and explanations about an AI dataset. It captures not just metadata, but also the *context, rationales*, and *human decisions* that shaped the dataset throughout its lifecycle. ([The Data Cards Playbook - Data Cards Playbook](#))

- CEOS-ARD helps **reduce AI risk**, by discouraging use of poorly characterised data in high-impact applications.
- CEOS agencies are recognised as **stewards of high-quality training data**.

Outcome Signal: CEOS-ARD is referenced as a quality baseline in AI research and operational deployment.

6: Adoption, Enablement & Impact

Maximize CEOS-ARD adoption across public procurement, commercial markets, and end-user communities.

Success Criteria:

- CEOS-ARD is routinely referenced in **procurement, funding calls, and operational requirements** as a baseline expectation.
- CEOS-ARD is recognised as **community-driven**, being co-developed by CEOS and the broader community.
- Derivative and thematic CEOS-ARD products directly support **priority user communities** (e.g. agriculture, biodiversity, disasters).
- Commercial providers see CEOS-ARD endorsement as a **market differentiator**, not a compliance burden.
- Training, outreach, and documented case studies clearly demonstrate **real-world impact and return on investment**.
- Growing number of CEOS-ARD compliant datasets and a growing annual volume of CEOS-ARD compliant datasets across common 'data distributor' platforms based on a 2026 baseline.

Outcome Signal: CEOS-ARD success is measured by use and impact including through increased citations in the scientific and general literature.