P03 — Full Provenance Traceability

SCD-P03 · Principle 3 of 10
Full Provenance Traceability
“Without provenance, a number is a narrative.”
Technical Layer

Definition

The complete chain of custody — from raw sensor or satellite observation to reported metric — must be documented and auditable. Required provenance fields: instrument ID, satellite scene ID and overpass timestamp, calibration method and version, analyst name and organisation, processing software version, and all transformations applied including unit conversions and spatial aggregations.

Rationale

Carbon credit verification under Verra VM0042 (2026) and CBAM third-party verification (EU 2023/956) both require proof that figures derive from primary instruments, not secondary aggregations of uncertain origin. Digital MRV (dMRV) standards from the Planet2050 × BioCarbon Working Group (2025) identify broken provenance as the leading cause of carbon credit invalidation.

Implementation Steps

1. For each reported metric, create a provenance record with: source instrument, timestamp, analyst, methodology version, and transformations applied.
2. Store provenance records in a format that is exportable and machine-readable (JSON-LD recommended).
3. Link provenance records to the reported metric via persistent identifier.
4. Implement versioning: when methodology changes, create a new version record — never overwrite.
5. For satellite-derived data: record scene ID, sensor, orbit number, cloud cover, and NDVI delta.

Compliance Checklist

	Criterion	What it means

?	**Instrument/source documented**	Every metric traces to a named instrument or dataset version.
?	**Timestamps recorded in UTC**	All events use ISO 8601 UTC timestamps.
?	**Analyst/author attributed**	Name and organisation of every analyst is recorded.
?	**Methodology version pinned**	Specific version of methodology used is recorded, not just the name.

Regulatory References

- Verra VM0042 Methodology (2026 update) — Section 5 (MRV requirements)
- CBAM Regulation EU 2023/956 — Art. 10 (Embedded emissions calculation)
- dMRV Working Group — Planet2050 × BioCarbon (2025)

Recommended Tools and Platforms

ESA Sentinel-2 scene IDs NASA Landsat overpass metadata IDEAM Colombia GFW GLAD Lab

Keywords

provenance chain of custody MRV dMRV carbon verification Verra CBAM

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