Support Boundaries: Where Measured Influence Ends

Finite support radii, stratum termination, and reversion to modelled — under GFMS-1.0

Public Cut · GFMS explainer series — Essay 2 of 3

Field	Value
Document ID	HPS-09-ART-SUPPORT-01-PUB
Version ID	1.0
Effective Date	2026-09-24
Supersedes	none (first public cut)
Classification	Public
Author	High Plains Shield, LLC
Format	F1 — Category / foundation essay (HPS-PUB-STD-001 v1.1)
Related	GFMS-1.0 Public (HPS-09-MAP-01) Clause 2; HPS-09-ART-BASIS-01-PUB; HPS-09-ART-MMG-01-PUB; HPS-09-ART-GFHL-01-PUB
Series	GFMS explainer — Essay 2 of 3 (Basis Tags → Support Boundaries → Fuel Condition Time Series)

Executive Summary

A single clipped plot must not “sponsor” fuel values at arbitrary distance or across stratum transitions. That is **false measured inheritance**, and it fails audit — even when every cell carries a basis tag.

Under GFMS-1.0 Clause 2, measured influence is finite. A physical measurement anchor **SHALL NOT** calibrate adjacent cells beyond a Support Radius (R_s) whose published normative maximum is **10.0 meters**. Influence **SHALL** terminate immediately at a Stratum Boundary, regardless of remaining distance. Cells beyond R_s or across a stratum **SHALL** automatically revert to **basis: modelled**.

This essay **teaches Clause 2** of GFMS-1.0 — spatial support boundaries and reversion rules — as the second conceptual pillar of the public GFMS explainer series. It does **not** replace the standard. Normative schema language, adequacy rules, and conformance classes live in **GFMS-1.0 Public** (Document ID HPS-09-MAP-01). Essay 1 (Basis Tags) taught *why every cell must declare origin*. This essay teaches *how far a measured anchor may influence adjacent cells*, and *when that influence must stop*.

Naming locks: CFI = category · **GFMS-1.0** = open standard · **GFHL** = spatial expression · **PlotSeal** = registry / system of record · **RiskWise** = commercial vehicle (stack role only, not the thesis). Method 1.1 and Level 3–4 internals are absent from this public face.

*Soft next step: read GFMS-1.0 Clause 2; re-read Basis Tags (Essay 1); ask of any fuel layer whether measured influence is bounded by R_s and stratum, and whether out-of-bound cells honestly revert to modelled. The next conceptual pillar in this series is **Fuel Condition Time Series** (currency of condition over time — not started here).*

1. Problem — False Measured Inheritance

Wildfire exposure decisions for utilities, insurers, reinsurers, model vendors, and infrastructure operators rest on spatial fuel layers. Basis tags (Essay 1) make origin readable. They do not, by themselves, stop a clipped plot from being treated as if it owned an entire parcel.

Failure mode	What it looks like	Audit defect
Unbounded radial paint	One plot’s load “fills” cells tens or hundreds of meters away with no declared support limit	Distant cells inherit measured-looking status without physical sample
Stratum bleed	Influence continues across shrub-steppe → gravel, treated buffer → unmanaged fuel, turf → wildland	Ecological / management transition ignored; wrong class sponsored as grounded
Parcel sponsorship	“We clipped once; the whole polygon is ground truth”	Parcel / AOI geometry substituted for support geometry
Soft fade without reversion	Influence decays visually but cells never revert to modelled	Reviewer sees continuous “evidence” with no hard stop

Claim (series thesis for Essay 2): Docket and underwriting defense requires **bounded influence**, not “one plot, whole parcel.” A fuel layer that declares basis but lets measured anchors travel unbounded still fails the underwriter’s second question: *how far does this plot’s authority reach — and where does honest modelled coverage resume?*

Illustration (non-normative): *An underwriter opens a corridor buffer. A sealed clipped plot sits at a fence corner. Cells within a few meters in the same treated strip are labeled grounded — constrained by that anchor. Ten meters beyond the support limit, cells still show the same load color. Across the gravel apron on the other side of a management line, cells still claim grounded. Without R_s and stratum termination, the plot appears to sponsor the whole view — and the docket cannot defend where measured influence ended.*

What breaks audit is not the existence of modelled cells beyond support. Modelled reversion is the honest outcome. What breaks audit is letting a single physical sample sponsor fuel values at arbitrary distance or across stratum transitions as if they were still

measured-constrained.

Asset monuments (permanent physical features such as fence corners or pad edges used as spatial origins) may anchor offset geometry for collection (per GFMS-1.0 definitions). They do **not** expand R_s. An Asset Monument is an origin reference, not a license for unbounded measured inheritance.

2. Framework — Support Boundaries Under GFMS-1.0 Clause 2

2.1 Support Radius (R_s)

Per GFMS-1.0 §1.3.2 and Clause 2:

- **Support Radius (R_s)** is the maximum horizontal distance over which a physical measurement anchor is permitted to influence or calibrate adjacent spatial cells.
- A physical measurement anchor **SHALL NOT** exert spatial influence or perform surface calibration beyond a maximum Support Radius (R_s) of **10.0 meters** (published normative maximum in GFMS-1.0 Public).

Claim (conceptual): Ten meters is a hard ceiling for measured *influence*, not a marketing radius. Implementations may use a smaller R_s; they **SHALL NOT** exceed the published maximum. This essay cites the published maximum because it is already public in GFMS-1.0 Public v1.1 — it does not invent a new threshold.

2.2 Stratum Boundary — immediate termination

Per GFMS-1.0 §1.3.2 and Clause 2:

- A **Stratum Boundary** is a discrete ecological, vegetation, or management zone transition beyond which a measurement anchor's spatial influence is forcibly terminated.
- Spatial propagation **SHALL** terminate immediately upon intersecting a Stratum Boundary (for example, shrub-steppe to bare gravel, or managed turf to untreated wildland fuel), **regardless of remaining distance** inside R_s.

Claim (conceptual): Distance remaining inside the support circle does not override a stratum crossing. Same-stratum membership is a co-condition with distance for grounded assignment — not an optional courtesy.

2.3 Reversion to modelled

Per GFMS-1.0 Clause 2: any spatial cell lying outside the Support Radius (R_s) **or** across a Stratum Boundary **SHALL** automatically revert to **basis: modelled**.

Implication of reversion: Silence is not "still grounded." Beyond support or across stratum, the honest label is modelled coverage until a new measured anchor (or valid grounded constraint within bounds) applies. Reversion protects reviewers from mistaking unbounded sponsorship for physical condition.

2.4 Cell basis assignment table (same as GFMS-1.0)

Requirement — Cell basis assignment (per GFMS-1.0 Clause 2 — teach attribution):

Condition	Cell basis
Distance = 0 (direct quadrat / sample location)	**measured**
0 < Distance ≤ R_s **and** same stratum	**grounded**
Distance > R_s **or** stratum boundary crossed	**modelled**

This table is identical in force to the assignment table published in GFMS-1.0. Essay 1 taught the three tags and the rule that proximity alone does not upgrade a cell to measured. Essay 2 teaches the distance and stratum co-conditions that decide when a cell may be grounded versus when it **must** revert to modelled.

2.5 What this essay defers

Topic	Where it lives
Mandatory basis declaration and enum lock	**GFMS-1.0** Clause 1 — taught in **Basis Tags** (Essay 1)
Statistical uncertainty, adequacy, UCB_{95}	**GFMS-1.0** Clause 3
Canonicalization / dual-digest verification	**GFMS-1.0** Clause 4
Full three-class foundation narrative	**HPS-09-ART-MMG-01-PUB**
Hazard-layer spatial expression	**HPS-09-ART-GFHL-01-PUB**
Fuel condition over time	Upcoming series essay (Fuel Condition Time Series) — **not started here**
Interpolation algorithms, DEM recipes, browser engines	**Not disclosed** — out of public scope

Soft pointer: *Fuel Condition Time Series is the next conceptual pillar — how fuel condition remains current over time. This essay stops at where measured influence ends in space.*

2.6 Naming locks and stack role

Name	Role	Not to be confused with
CFI	Enterprise technology **category**	Not “the standard”; not a support radius
GFMS-1.0	Open **interface standard** (Clause 2 = support boundaries & reversion)	Not a product; not this essay
GFHL	**Spatial expression** of grounded fuel at hazard-layer scale	Not a fire-behavior model
PlotSeal	**Registry / system of record** concept for sealed observations	Not “Wildfire Data Center”; internals not public
Basis Tags essay	Essay 1 — mandatory origin declaration	Not the Clause 2 teaching piece (this essay is)
RiskWise	**Commercial vehicle** (stack role only)	Not the thesis of this document

Allowed public phrase: Proprietary field-collection protocols may produce GFMS-1.0-conformant payloads that respect support bounds and stratum termination; they are not required for external conformance to the open interface.

3. Proof — Support Radius and Stratum Termination

3.1 Why the bound is the audit unit for influence

Claim: For fuel-layer audit, after basis is declared, the natural unit of *authority* is the **bounded neighborhood of a measured anchor** — not the parcel outline and not the map extent. A layer that says “grounded fuel” while a single plot sponsors cells beyond R_s or across stratum still fails the underwriter’s question: *where did measured influence stop?*

Illustration (non-normative) — three audit questions Clause 2 makes answerable:

- *How far may this measured anchor constrain adjacent cells?* → Support Radius R_s (≤ 10.0 m published maximum).
- *Does influence continue across a vegetation or management transition?* → No — stratum termination is immediate.
- *What is the honest basis beyond those limits?* → Automatic reversion to modelled.

3.2 Figure 1 — Support radius + stratum termination schematic

Aligned with GFMS-1.0 Figure 1 and Clause 2; essay-taught. Schematic only — not a field protocol and not a substitute for the normative standard.

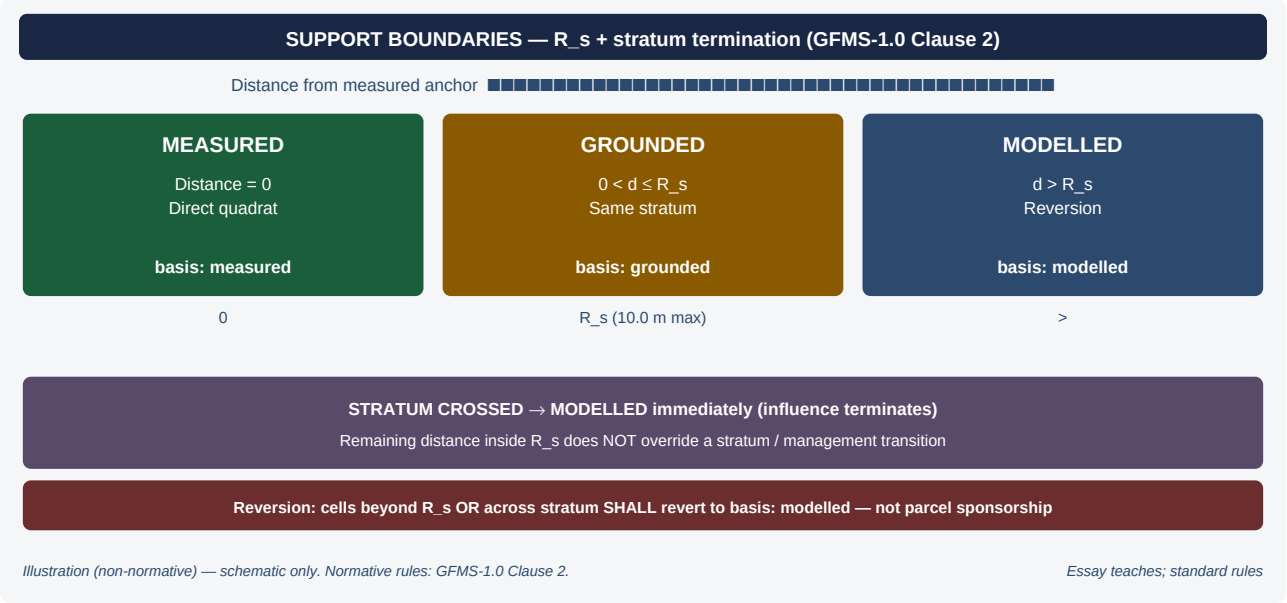

Figure 1 — Support radius and stratum termination. Illustration (non-normative). Normative R_s = 10.0 m maximum, stratum termination, and reversion rules: GFMS-1.0 Clause 2. Basis enum and seal discipline: HPS-09-ART-BASIS-01-PUB / GFMS-1.0 Clause 1.

Condition	Required basis (per GFMS-1.0)
Distance = 0 (direct sample location)	**measured**
0 < Distance ≤ R_s **and** same stratum	**grounded**
Distance > R_s **or** stratum boundary crossed	**modelled**

3.3 Claim vs illustration discipline

Statement class	Example in this essay
Claim	Unbounded measured sponsorship of parcel-scale cells fails audit readiness for high-consequence use

Statement class	Example in this essay
Requirement (per GFMS-1.0)	Anchor SHALL NOT influence beyond $R_s \leq 10.0$ m; SHALL terminate at stratum; out-of-bound cells SHALL revert to modelled
Claim (conceptual)	Asset Monument origins do not expand R_s; they are spatial references, not sponsorship licenses
Illustration (non-normative)	Figure 1 schematic; corridor / fence-corner underwriter example
Deferred requirement	Adequacy, UCB_{95}, conformance classes → **GFMS-1.0** Clause 3+; Fuel Condition Time Series essay next

This essay teaches Clause 2. It does not replace GFMS-1.0 as the rulebook, and it does not invent interpolation algorithms or proprietary engines.

3.4 Comparative standing (informative)

Property	Unbounded “one plot, whole parcel”	Bounded under GFMS-1.0 Clause 2
Maximum measured influence distance	Often unspecified / parcel-scale	Hard $R_s \leq 10.0$ m (published maximum)
Stratum / management transitions	Often ignored	Immediate termination
Cells beyond support	May retain measured-looking or grounded labels	**SHALL** revert to modelled
Assignment co-conditions	Distance alone (or none)	Distance **and** same stratum for grounded
Audit question: where does influence end?	Usually unanswerable from the layer alone	Answerable from R_s + stratum + reversion

4. Implication — Defense Requires Bounded Influence

Support boundaries matter wherever a fuel number must survive third-party challenge:

- **Utility wildfire mitigation plans (WMPs)** and related regulatory dockets that must defend how far a clipped plot’s authority reaches — not only that a plot exists.
- **Insurance and reinsurance analytics** that underwrite or price wildfire exposure and need to separate locally constrained grounded cells from out-of-bound modelled coverage.
- **Catastrophe and wildfire model vendors** (and their clients) that need spatially honest fuel inputs rather than parcel-sponsored “ground truth.”
- **GIS and spatial-platform operators** that publish or consume fuel layers and need shared rules for support termination.
- **Infrastructure asset owners** that document corridor and pad-edge fuel state without claiming the whole AOI is measured-constrained.

Implication for adopters: After the **tag** (Essay 1), adopt **support bounds**. Bounded influence beats parcel sponsorship. Then adopt the full **open standard** (GFMS-1.0) for normative interface rules. Evaluate commercial vehicles — including RiskWise — only after the interface and evidence properties are clear. Category and standard growth do not require exclusive use of any one vendor; they require shared rules and verifiable properties.

Soft next step (teach, don’t sell)

1. Read **GFMS-1.0** Clause 2 (Public cut) — Document ID HPS-09-MAP-01 — for normative support-radius, stratum, and reversion requirements.
2. Re-read **Basis Tags** — Document ID HPS-09-ART-BASIS-01-PUB — for mandatory origin declaration (Clause 1 teaching).
3. Read **Measured, Modelled, and Grounded** — Document ID HPS-09-ART-MMG-01-PUB — for the foundation definitions of the three classes.
4. Read **GFHL Overview** — Document ID HPS-09-ART-GFHL-01-PUB — for how basis expresses at hazard-layer scale.
5. Ask of any fuel layer: *Is measured influence bounded by R_s? Does stratum terminate immediately? Do out-of-bound cells revert to modelled?*
6. Watch for the next essay in this series — **Fuel Condition Time Series** — on currency of condition over time (not started here).
7. Contact High Plains Shield, LLC at **info@highplainshield.com** for standards clarification or conformant-implementation questions — not a product hard sell.

5. Limitations — What This Document Is Not

This Public cut:

- **Is not** an open standard (see GFMS-1.0).
- **Is not** a substitute for GFMS-1.0 Clause 2 normative language.
- **Is not** a product datasheet, SKU list, drop ID list, or pricing document.
- **Is not** a disclosure of proprietary field-collection protocols, registry architecture, key-management, device attestation, scoring engines, calibration weights, browser-storage internals, full cell JSON schemas, interpolation recipes, DEM pipelines, or trade-secret thresholds.
- **Does not** invent algorithms (no IDW_BOUNDED, Wasm engines, or proprietary DEM recipes).

- **Does not** write the Fuel Condition Time Series essay (series essay 3 — **not started here**).
- **Does not** redo Basis Tags (Essay 1) or restate Clause 1 as if this were the rulebook for tagging.
- **Does not** invent a fourth GFMS basis enum value.
- **Does not** guarantee regulatory acceptance in any specific jurisdiction.
- **Does not** describe PlotSeal or commercial-vehicle internals beyond public naming-lock roles.
- **Does not** claim market share or present “Wildfire Data Center” framing.
- **Mentions Asset Monument only conceptually** (as in GFMS-1.0 definitions) — no product internals.

Not disclosed (IP gate): Method 1.1, FMES, HPFS, Structural MVE, CAT packs, Field Gauge, TrueFuel, WROS, VALOR, drop IDs, Wasm, device-binding recipes, proprietary engines, and related Level 3–4 internals remain internal under HPS-PUB-STD-001 §4. Quantitative performance claims for any commercial implementation are **out of scope** here.

6. Glossary

Term	Public meaning
Support radius (R_s)	Maximum horizontal distance a physical measurement anchor may influence or calibrate adjacent cells; normative maximum published in GFMS-1.0 = **10.0 m** (Clause 2).
Stratum boundary	Ecological, vegetation, or management zone transition beyond which measured influence terminates immediately, regardless of remaining distance inside R_s.
Support	The bounded neighborhood within which a measured anchor may constrain adjacent cells (same stratum and $d \le R_s$).
Reversion	Mandatory return to basis: modelled for any cell outside R_s or across a stratum boundary (GFMS-1.0 Clause 2).
Measured	Basis class: direct physical empirical observation at a known place and time (distance = 0); cells do not inherit Measured by proximity alone.
Grounded	Basis class: model-initiated surface constrained by local measured anchors within R_s and the same stratum; does not become Measured by inheritance.
Modelled	Basis class: algorithmic / spectral / ML inference without on-site weighed biomass for that cell; also the required label after reversion beyond support or across stratum.
Basis tag	Mandatory origin declaration: measured, modelled, or grounded (GFMS-1.0 Clause 1; taught in Basis Tags essay).
Asset Monument	Permanent physical feature of an asset used as spatial origin for offset geometry (GFMS-1.0 definition); does not expand R_s.
GFMS-1.0	Grounded Fuel Mapping Standard — open interface standard. Clause 2 = spatial support boundaries & reversion rules.
CFI	Enterprise technology category for physical, cryptographically proven fuel intelligence. Not “the standard.”
GFHL	Spatial expression of grounded fuel at hazard-layer scale.
PlotSeal	Registry / system of record concept for sealed fuel measurement records. Not “Wildfire Data Center.”
RiskWise	Commercial vehicle that may implement CFI-conformant workflows. Stack role only; not the thesis of this essay.

Document Control

Field	Value
Document ID	HPS-09-ART-SUPPORT-01-PUB
Title	Support Boundaries: Where Measured Influence Ends
Version	1.0
Effective	2026-09-24
Supersedes	none (first public cut)
Classification	Public
Author	High Plains Shield, LLC
Governing house standard	HPS-PUB-STD-001 v1.1
Informative precursors	GFMS-1.0 Public v1.1 (esp. Clause 2); HPS-09-ART-BASIS-01-PUB; HPS-09-ART-MMG-01-PUB; HPS-09-ART-GFHL-01-PUB
Series position	GFMS explainer series — Essay 2 of 3
Contact	info@highplainshield.com

Revision History

Version	Effective	Summary	Gates
Public v1.0	2026-09-24	First dedicated public GFMS explainer essay on Support Boundaries: teaches GFMS-1.0 Clause 2; $R_s \leq 10.0$ m published maximum; stratum termination; mandatory reversion to modelled; assignment table aligned with GFMS; Figure 1 support-radius + stratum schematic; soft pointer back to Basis Tags and forward to Fuel Condition Time Series (not started); naming locks; Limitations + Glossary; soft CTA; §4 scrub; clean Markdown → PDF.	Author → Technical Review → Publication Review → Release (HPS process)

Pre-Publish Checklist (Hard Gate) — Recorded Pass

- ■ Format F1 selected; Problem → Framework → Proof → Implication spine complete
- ■ Author = High Plains Shield, LLC everywhere (including metadata)
- ■ Face block complete: Document ID · Version ID · Effective Date · Supersedes · Classification · Author
- ■ Naming locks: CFI = category · GFMS-1.0 = standard · RiskWise = commercial vehicle · PlotSeal = registry/SoR · GFHL = spatial expression · Method 1.1 / forbidden internals absent
- ■ Claims vs illustrations labeled; Limitations present; Glossary present
- ■ IP gate cleared (§4 scrub): Method 1.1, FMES, HPFS, Structural MVE, CAT packs, Field Gauge / TrueFuel / WROS / VALOR, drop IDs, Wasm, device-binding recipes, proprietary engines absent (absent lines + Limitations Not disclosed only)
- ■ Visual proof: Figure 1 support radius + stratum termination schematic
- ■ Production clean from Markdown (no DOCX artifacts)
- ■ Technical Review + Publication Review recorded (HPS process)
- ■ Minimum credibility length met; teach-don't-sell tone verified
- ■ No Netlify publish (held); parent attaches PDF only for peer review
- ■ Series discipline: T11 Fuel Condition Time Series not started; Final Cut masters not overwritten