WORLDNERVE

Ongoing Ground Movement Monitoring and Change Detection

A real-data sample for sites, corridors, facilities, projects, and portfolios that need repeatable movement intelligence.

HOUSTON REFERENCE SITE
165 observation dates | January 2020 to July 2025 | Baseline plus update comparison

THE MONITORING QUESTION

Has the location changed behaviour since the baseline?

Current reading
Persistent movement remains measurable. Acceleration is not confirmed in the update period.

Prospect sample
Real measurements. Public reference site. No confidential client data.

Monitoring status at a glance

The baseline establishes the site's normal measured behaviour. The update period then tests whether movement persists, stabilizes, reverses, or accelerates.

REVIEW	-3.0	-0.8	165	5.5 yrs
CURRENT STATUS	BASELINE MM/YEAR	UPDATE MM/YEAR	OBSERVATION DATES	EVIDENCE SPAN

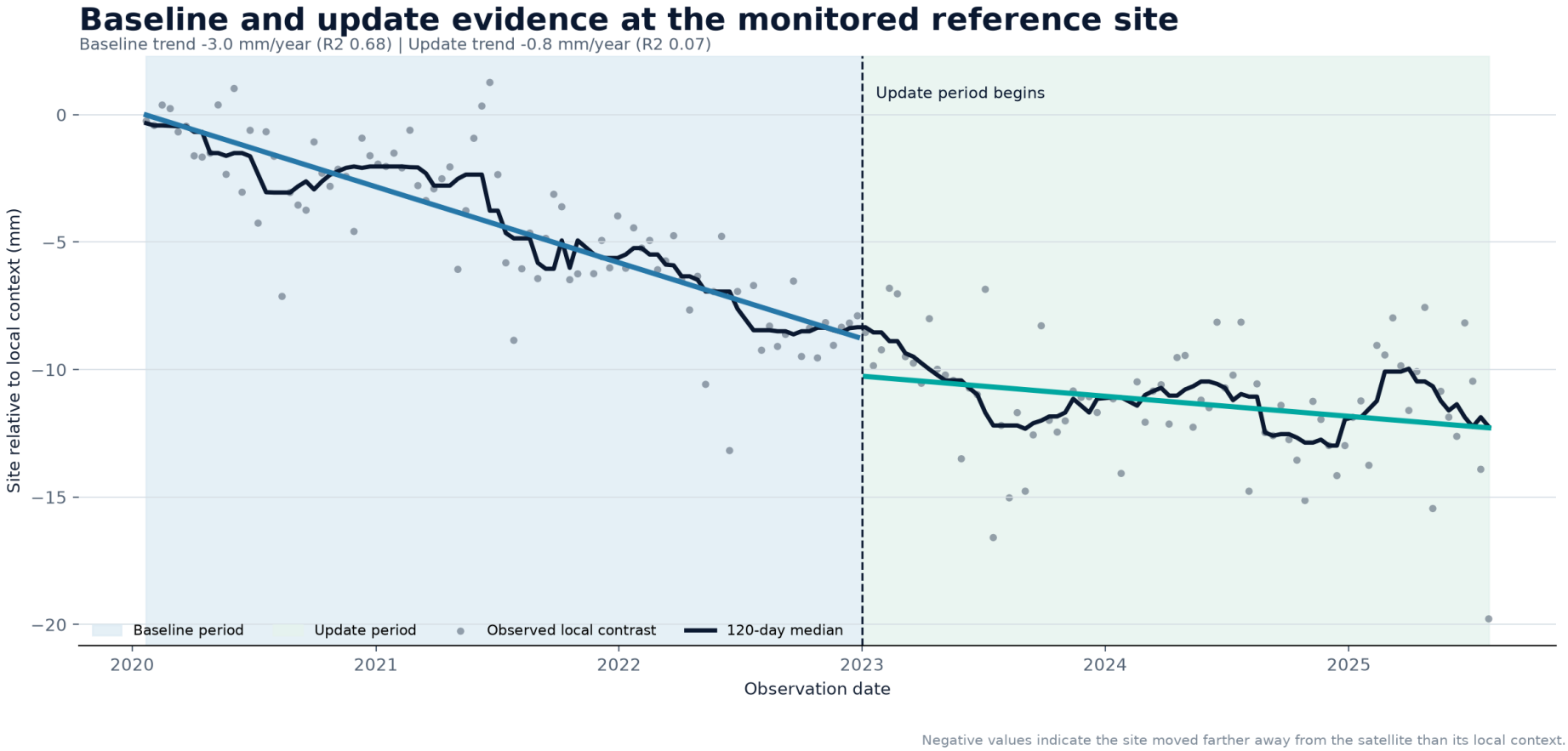
Question	Measured result	Decision implication
Is movement persistent?	Yes. The full relative record trends at -2.4 mm/year with R2 0.75.	Retain the site in the review and monitoring programme.
Has the update accelerated?	No confirmed acceleration. The update trend is -0.8 mm/year versus -3.0 mm/year in the baseline.	Do not escalate solely on trend acceleration; continue periodic review.
Is a field response justified?	Satellite evidence identifies a persistent local movement pattern, not condition or cause.	Use asset criticality, condition, maintenance history, and engineering judgment to set the response.

Monitoring conclusion

Persistent local movement remains measurable. The update-period trend is flatter and weakly fitted, so the evidence does not confirm acceleration. The appropriate status is Review, with continued updates and asset-context checks.

Baseline and update comparison

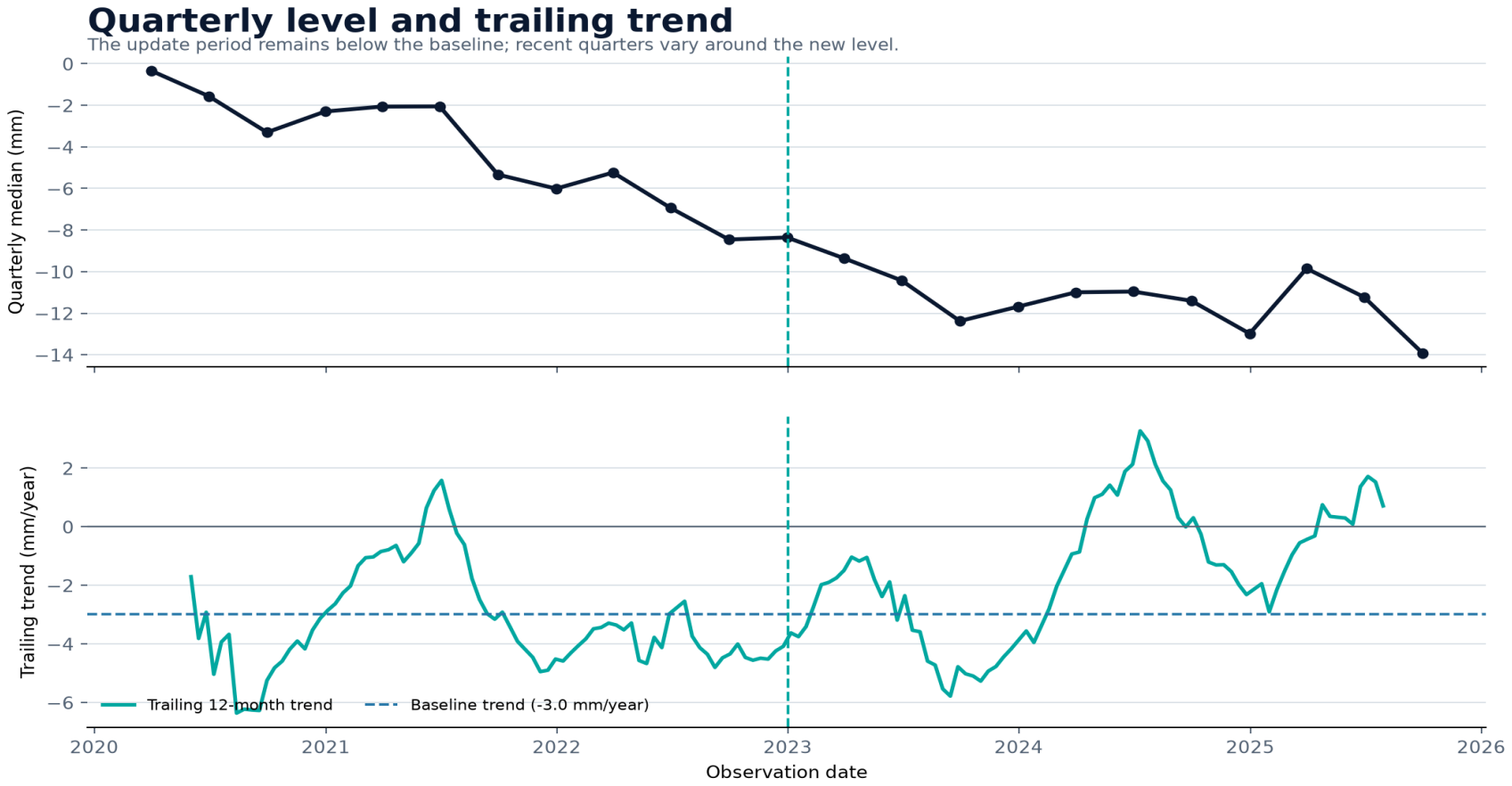
Each observation is compared with the surrounding local context. Period-level trend lines separate persistent behaviour from short-lived variation.



The negative level established during the baseline remains visible through the update. Recent observations fluctuate, but the update-period regression is not strong enough to support an acceleration finding.

Change detection without overreacting to noise

Quarterly medians reveal the level of movement; trailing trends show how the recent trajectory changes through time. Both are reviewed together before status is changed.



Rolling trends are diagnostic indicators; isolated short-term swings require review against the full record.

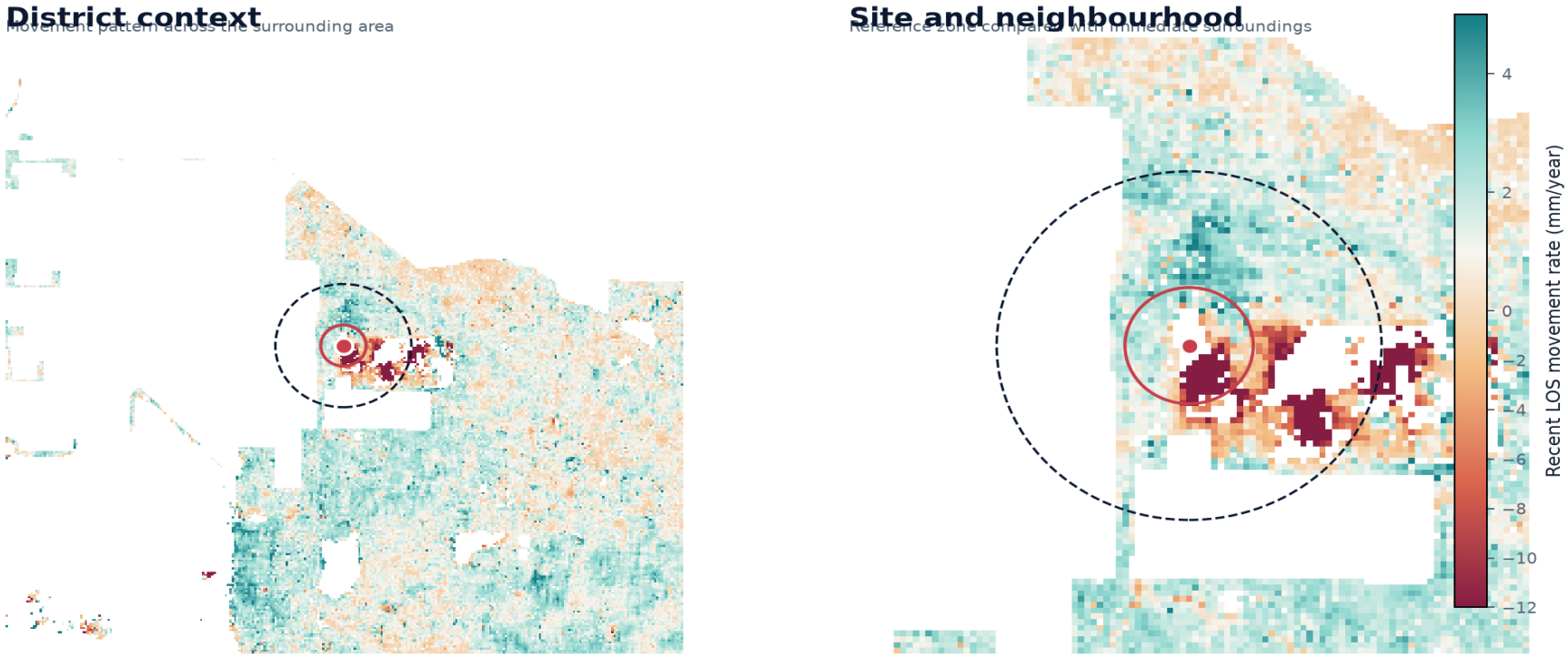
What changed	What did not change	Monitoring action
The site moved to a more negative relative level from 2020 through 2023.	The update period does not show a stronger sustained trend than the baseline.	Keep Review status; refresh the series and investigate asset context if material.

Spatial context confirms where to look

Monitoring is strongest when the time series is read alongside the surrounding measured pattern. The map checks whether the signal is localized, shared across a wider zone, or affected by weak spatial coverage.

Measured movement around the reference site

Red marker: reference site | Solid ring: 300 m screen | Dashed ring: neighbourhood context



Monitored location	Spatial evidence	Client overlay
REF-001 Dancy Rd, Houston, TX, 77041, USA 29.85611, -95.56085	The reference location is assessed against immediate and district-scale surroundings, reducing reliance on one pixel.	Add the actual asset footprint, route, parcel, structures, critical components, and inspection records to determine operational relevance.

Monitoring update log

The update log gives decision-makers a compact record of what was observed, what changed, and why the monitoring status was retained or revised.

Year	Observations	Median relative LOS	Change from prior year	Interpretation
2020	29	-1.6 mm	-	Baseline established
2021	30	-3.5 mm	-1.9 mm	Negative level deepened
2022	29	-7.7 mm	-4.2 mm	Negative level deepened
2023	30	-10.8 mm	-3.1 mm	Negative level deepened
2024	29	-11.5 mm	-0.7 mm	Broadly level year on year
2025	18	-11.0 mm	+0.5 mm	Broadly level year on year (partial year)

Monitoring period	Dates	Trend	Fit	Period reading
Baseline	2020-01-22 to 2022-12-25	-3.0 mm/year	R2 0.68	Persistent negative relative LOS trend establishes the baseline.
Update	2023-01-06 to 2025-07-30	-0.8 mm/year	R2 0.07	Movement remains negative; the update-period trend is weaker and acceleration is not confirmed.

2025 is a partial year through 30 July. Annual medians describe the measured relative LOS level; they are not vertical settlement values.

A repeatable monitoring service, not a one-off map

1. DEFINE	2. ESTABLISH	3. UPDATE	4. REVIEW
Client and WorldNerve Sites and footprints Decision cadence Review rules Operational context	**Historical baseline** Movement level Trend and variability Spatial context Evidence coverage	**New acquisitions** Append observations Recalculate indicators Compare with baseline Flag evidence gaps	**Decision output** Retain or revise status Explain the change Issue map and data Record next action

Each update can include

Status summary: stable, review, escalating, or evidence gap.
Change evidence: updated series, trend comparison, and spatial map.
Decision register: location, status, rationale, and next action.
Data: client-ready CSV and GIS layers for integration.

Operating boundary

This is trend monitoring, not real-time warning. Satellite revisits support periodic change detection, while rapid failures between acquisitions cannot be predicted.

Client decision remains central

Movement evidence should be combined with asset criticality, condition, design, maintenance, survey, and engineering information.

START WITH ONE MONITORING PILOT

Turn a historical baseline into a repeatable decision service.

Begin with one priority site, corridor, facility group, development, or portfolio and agree how movement evidence should influence action.

zeeshan@worldnerve.com
www.worldnerve.com

What to send

Site coordinates, parcels, footprints, or route geometry, plus asset IDs and optional criticality, condition, works, and inspection fields.

What we agree

Baseline period, update cadence, review rules, recipients, data format, and the field or specialist pathway for material findings.

What the pilot proves

Whether repeat observations add useful lead time, prioritization, documentation, and decision consistency for the chosen assets.

Data basis: OPERA Surface Displacement (DISP-S1), ascending track 34 / frame 8882; 165 observations from January 2020 to July 2025. The short-wavelength LOS series uses a local reference framework. LOS combines vertical and horizontal motion; negative values are movement away from the satellite, not direct vertical-settlement estimates. The public reference site demonstrates the monitoring format and is not a confidential client asset.