Northstar Analytics

CECL Suite v4.2
Model Monitoring & Governance Guide

Document ID: NA-CECL-MON-4.2
Release Date: February 17, 2026

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Document Control

Version	Date	Author	Reviewer	Summary of Changes
1.0	2025-10-01	M. Patel	R. Chen	Initial monitoring framework and sample KPI catalog
1.1	2025-12-20	M. Patel	R. Chen	Added drift thresholds; expanded override governance
1.2	2026-02-17	M. Patel	R. Chen	Refined SR 11-7 alignment matrix; added escalation paths and evidence checklists

Distribution and Use

This guide describes a vendor-recommended monitoring and governance approach for the Northstar CECL Suite. It supports establishing repeatable monitoring routines, defining thresholds, documenting exceptions, and maintaining evidence for model risk management. This document is written in a vendor governance enablement format and is not aligned to client model documentation templates.

Table of Contents (Generated in Word)

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1. Purpose, Scope, and Definitions

Purpose: define a structured monitoring program for the CECL Suite supporting data integrity, stability checks, output review, exception handling, and evidence retention.
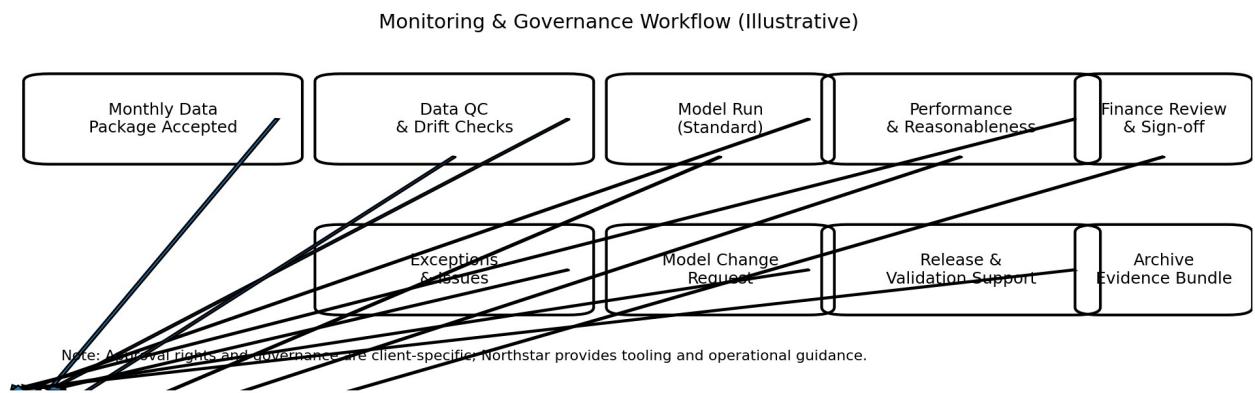
Scope: monitoring of inputs (data and scenarios) and outputs (ECL metrics and drivers), thresholds and escalation, issues and changes, and evidence retention. This guide complements client governance policies.

1.1 Key Definitions (Vendor)

Term	Definition
Monitoring Pack	Monthly set of KPI tables, variance views, and exception logs supporting close sign-off.
Exception	Deviation from rules/thresholds requiring review and documentation.
Override	Controlled adjustment within configuration per client governance.
Overlay	Management adjustment outside model output.
Drift	Distributional shift in drivers or mix that may affect performance.

2. Monitoring & Governance Workflow
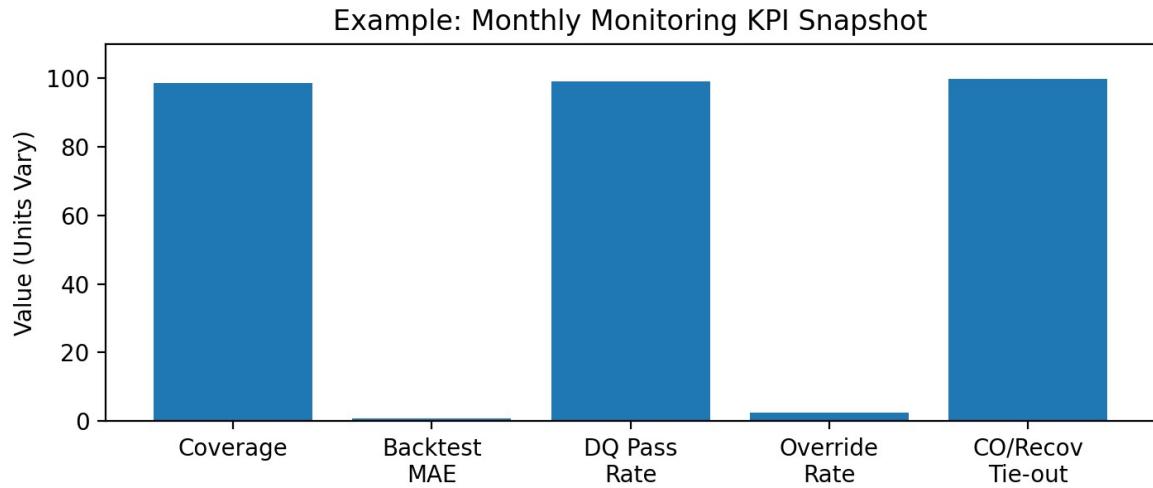
Monitoring is integrated with the close run: pre-run QC and drift screening, post-run reasonableness and variance checks, documented exception handling, and archiving of evidence bundles.

Monitoring & Governance Workflow (Illustrative)

| Monthly Data Package Accepted | Data QC & Drift Checks | Model Run (Standard) | Performance & Reasonableness | Finance Review & Sign-off |
| Exceptions & Issues | Model Change Request | Release & Validation Support | Archive Evidence Bundle |

Note: Approval rights and governance are client-specific; Northstar provides tooling and operational guidance.

3. Monitoring Cadence and Minimum Expectations

Frequency	Monitoring Activities	Primary Owner	Outputs
Monthly (Close)	QC, drift screening, output variance checks, override log updates	Data Steward / Finance Reviewer	Monitoring pack + sign-off
Quarterly	Threshold recalibration review; segmentation stability review	Model Owner / MRM	Quarterly monitoring memo
Annually	Performance assessment, benchmarking, documentation refresh	Model Owner / MRM	Annual assessment
Ad hoc	Event-driven reviews due to portfolio or policy changes	Model Owner	Event memo
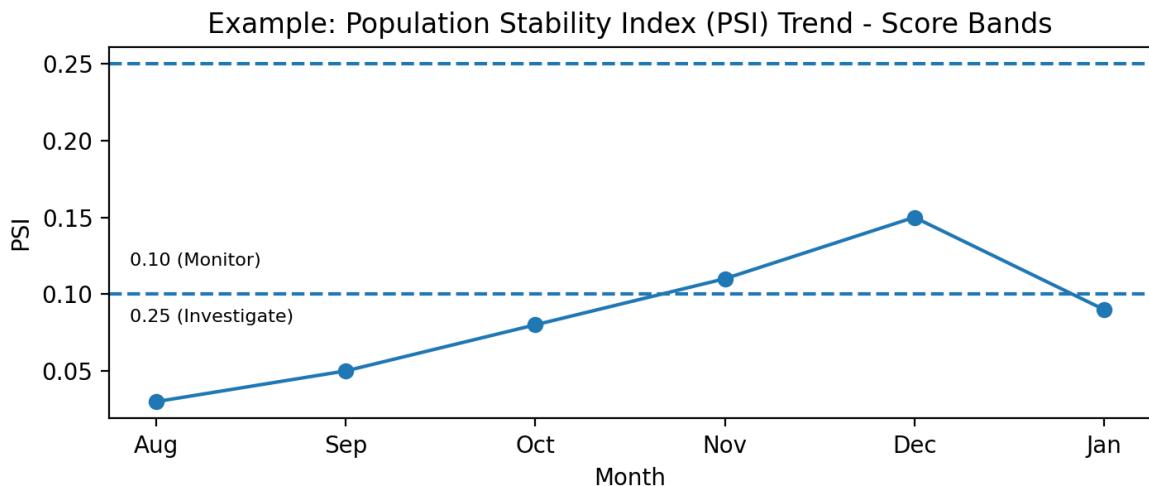
Exhibit: Example KPI Snapshot

Example: Monthly Monitoring KPI Snapshot

4. Data Quality & Data Drift Monitoring

- Schema/required fields completeness by segment.
- Uniqueness/referential integrity for keys and joins.
- Range and validity checks (e.g., DPD bounds, non-negative balances).
- Aggregate balance movement checks vs transactions and charge-offs/recoveries.

Exhibit: PSI Trend (Illustrative)

Example: Population Stability Index (PSI) Trend - Score Bands

4.1 Example Thresholds

Area	Green	Amber (Monitor)	Red (Investigate)
PSI (driver)	< 0.10	0.10–0.25	> 0.25
Segment mix shift	< 3% abs	3–8% abs	> 8% abs
Missingness (key field)	< 0.5%	0.5–2.0%	> 2.0%
Balance reconciliation	< 0.5% var	0.5–1.0%	> 1.0%

5. Model Performance Monitoring (PD/LGD/EAD/Lifetime ECL)

- Segment ECL variance vs prior period with attribution (balance, PD, LGD, scenario).
- Distribution stability of PD/LGD/EAD by segment (mean/median, tail checks).
- Constraint checks: PD/LGD in [0,1], EAD non-negative, discount factors monotonic.
- Outcome proxies: short-horizon realized losses, roll rates, and vintage diagnostics where applicable.

5.1 Trigger Events for Enhanced Monitoring

- Acquisitions/sales or core system conversions.
- Material underwriting/collections changes.
- Macroeconomic regime change or forecast volatility.
- Policy changes impacting charge-off/recovery recognition.

6. Scenario Governance (Macro Inputs and Weights)

Scenario selection and weighting are client decisions. The vendor supports ingestion, mapping, versioning, and traceability of scenario artifacts.

Artifact	Description	Evidence Example
Scenario package	Macro time series (baseline/adverse/etc.)	Source citation + checksums
Scenario mapping	Series mapping to model drivers	Mapping workbook version
Weights memo	Approved weights and rationale	Finance/MRM memo
Reversion settings	Horizon and method	RUN_CONTROL snapshot

7. Overrides, Qualitative Adjustments, and Management Overlays

Category	Example	Governance Control
Data override	Correct segment override for known misclassification	Exception memo + approval + effective dates
Parameter override	Temporary LGD floor for stressed segment	Change ticket + impact analysis + sunset date
Segmentation override	Move accounts to workout segment	Policy alignment + exception log
Post-model overlay	Qualitative adjustment for emerging risk	Overlay memo + approvals + persistence monitoring

8. Thresholds, Escalation, and Issue Management

Tier	Trigger	Required Action	Decision Owner (Typical)
Tier 0 (Info)	Green KPI movement	Record in pack	Run Operator
Tier 1 (Monitor)	Amber breach	Commentary; monitor next period	Model Owner
Tier 2 (Investigate)	Red breach or repeated amber	RCA; remediation plan	Model Owner + Data Steward
Tier 3 (Governance)	Material impact or policy breach	Committee review; consider rerun/overlay	MRM / Finance Committee

8.1 Issue Lifecycle (Vendor)

1. Detect
2. Triage
3. Remediate
4. Validate
5. Close

9. Model Change Management and Release Governance

Change Type	Examples	Minimum Controls
Vendor release	Bug fixes, algorithm improvements, new exports	Release notes + UAT + baseline comparisons
Config change	Thresholds, scenario mapping, segmentation tables	Ticket + approvals + UAT
Mapping/ETL change	New field or sign convention change	Parallel load + reconciliation + QC sign-off
Emergency hotfix	Production defect requiring immediate patch	Break-glass approvals + post-incident review

10. Evidence, Auditability, and Retention

- Inputs/outputs/config snapshots with checksums and run identifiers.
- Monitoring packs and variance commentary.
- Exception/override/overlay logs and approvals.
- Change tickets, UAT results, and release notes.

Artifact Type	Recommended Retention	Notes
Inputs/Outputs/Config snapshots	>= 7 years	Align to financial reporting retention requirements
Monitoring packs	>= 7 years	Supports trends and examinations
Issue tickets	>= 3 years	Retain longer for recurring themes
Approvals/committee materials	Per client policy	Often aligned to corporate governance retention

11. Roles, RACI, and Operating Committees (Vendor Terminology)

Activity	Run Operator	Data Steward	Model Owner	Finance Reviewer	MRM
Monthly QC review	C	R	C	I	I
Reconciliations	I	R	C	C	I
Scenario approval	I	I	C	R	C
Variance commentary	C	C	R	R	C
Override approval	I	C	R	R	C
Material change control	C	C	R	C	R

12. Regulatory Alignment Matrix (Illustrative)

Illustrative mapping to common model risk governance themes; clients should align to internal policy and applicable guidance. This is not legal advice.

Governance Theme	Typical Expectation	Guide Coverage	Example Evidence
Ongoing monitoring	Track performance and stability over time	Sections 3–5	Monitoring packs; trend KPIs
Data integrity	Ensure inputs are accurate and complete	Section 4	QC reports; reconciliations
Change control	Controlled changes with testing and approvals	Section 9	Tickets; UAT results
Override governance	Transparent and justified overrides/overlays	Section 7	Override logs; approvals
Documentation & auditability	Support review and re-performance	Section 10	Evidence bundles; snapshots

Appendix A: Sample Monthly Monitoring Pack Outline

6. Executive summary and approvals
7. Input QC and reconciliations
8. Drift dashboard and commentary
9. Output variance and attribution
10. Exceptions, overrides, overlays log
11. Scenario confirmation and reversion settings
12. Appendix: detailed tables and extracts

Appendix B: KPI Dictionary (Excerpt)

KPI	Definition	Calculation	Suggested Threshold	Notes
Input coverage	% accounts with required fields	1 - missing/total	>= 98%	By segment and total
Balance tie-out	Variance vs control total	|model-control|/control	< 0.5%	Investigate structural diffs
PSI (score)	Distribution shift vs baseline	PSI on bins	< 0.10	Monitor at 0.10; investigate at 0.25
ECL variance	Change vs prior period	$(ECL\_t - ECL\_{t-1})/ECL\_{t-1}$	Client-defined	Use attribution
Override rate	% balances affected	override_bal/ total_bal	Client-defined	Track persistence

Appendix C: Templates (Printable)

C.1 Exception Memo Template (Outline)

13. Exception ID and date
14. Description and impacted portfolios/segments
15. Detection method and threshold trigger
16. Root cause assessment
17. Disposition (fix/accept/rerun/overlay)
18. Impact quantification (ECL delta)
19. Approvals and signatures
20. Follow-up actions and prevention

C.2 Change Request Template (Outline)

21. Change summary and classification
22. Rationale and expected impact
23. Testing plan and acceptance criteria
24. Baseline comparison results
25. Implementation and rollback plan
26. Approvals and implementation window

Appendix D: Glossary

Term	Definition
ECL	Expected credit loss output (typically lifetime for CECL).
PSI	Population Stability Index; measure of distribution shift.
MRM	Model Risk Management function.
QC	Quality control checks on inputs/outputs.
UAT	User acceptance testing environment.