A Minimum Viable Climate Integration Roadmap for Insurers

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INTRODUCTION

Sometime in 2019, *The Economist*, a newspaper, featured on its cover a timeline from 1850 to the present day with a background of vertical stripes, each representing the global average temperature of each year. These stripes were colored in different hues of blue up to about the late 1990s. Then the stripes became pale pink, pale orange, red, and finally, dark red.[1] This illustration spurred me to start paying attention to climate risk, and most intriguingly, that I have found in my professional practice that many insurers have yet to fully adapt their loss models to account for climate risk.

To make climate risk actionable it should be treated with discipline within the insurer's ERM framework. It should be governed, measured, and linked to decisions, rather than be considered as a standalone risk. Supervisory and disclosure frameworks are typically aligned on expectations such as board oversight, integration into enterprise risk management, forward-looking scenario analysis, and metrics.

This article proposes a minimum viable climate integration roadmap across five organizational levers: people, process, data, models, and reporting. Early outputs should be visible and decision-relevant, while building the foundations for deeper processes such as catastrophe (CAT) model integration, internal vulnerability curves, and climate-adjusted experience analysis, in three phases over a two-year period: days 1–90, days 91–365, and days 366–730.

WHY IT WORKS FOR ACTUARIES?

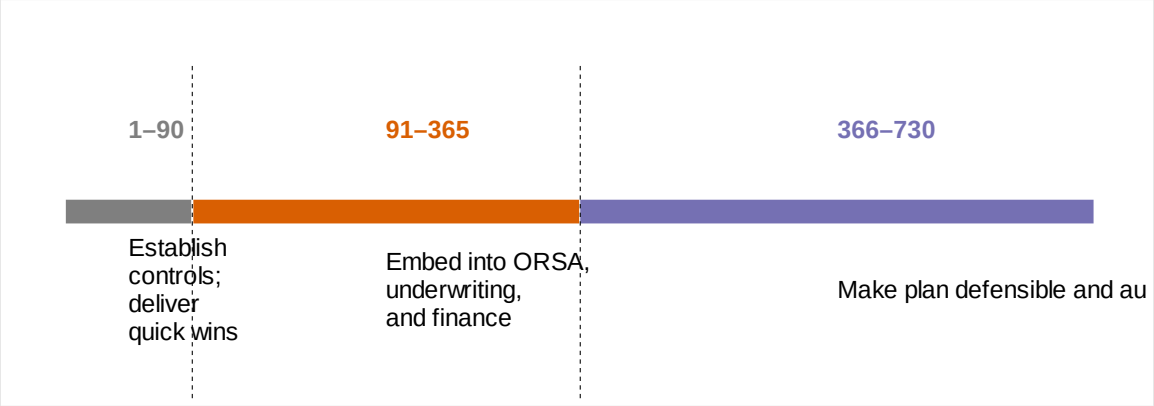
The proposed roadmap works for actuaries because it translates climate risk into the same disciplined workflow actuaries already use to manage uncertainty: define the risk, measure it with fit-for-purpose data and models, govern the assumptions, and link outputs to decisions and controls. The roadmap is essentially an actuarial "control cycle" applied to climate—identify and scope, quantify and monitor, then embed into pricing/reserving/capital and iterate—so it aligns naturally with established actuarial governance and ERM practice.

The roadmap also matches how actuarial work is operationalized in insurers: short decision cycles (pricing/underwriting) sit alongside longer balance-sheet cycles (reserving and capital) and disclosure cycles. By sequencing quick wins (exposure inventory, geocoding, heatmaps, risk metrics) ahead of deeper builds (vendor CAT integration, vulnerability curves, climate-adjusted experience studies), the roadmap

[1] *The Economist* published "The climate issue" piece (Sept 19, 2019) with the line "The world is about 1ºC hotter than when this newspaper was young," and the cover stripes are described as years 1850–2018.

respects actuarial materiality and proportionality by improving decisions immediately while building evidence over time for assumption changes and model enhancements.

THE ROADMAP



Phase 1 (Days 1–90) focuses on establishing basic controls and delivering visible "quick wins" that create momentum and credibility. The insurer appoints clear ownership (executive sponsor, cross-functional squad, committee oversight), runs an initial materiality assessment to prioritize a small number of use cases, and rapidly improves the exposure inventory, often starting with portfolio geocoding and a data-quality scorecard. In parallel, it produces a baseline view using existing vendor CAT models where available (and simple sensitivities where not), documents limitations, and launches a first metrics dashboard with owners and escalation thresholds. By day 90, tangible outputs include exposure heatmaps, an initial scenario set with an assumptions log, and basic change control for climate data and modeling overlays.

Phase 2 (Days 91–365) embeds climate risk into the annual management cycle—especially ERM, risk appetite, and ORSA (EIOPA, 2022)—so the work becomes "business as usual" rather than an initiative. Responsibilities are formalized in policies and committee terms of reference, and a training plan ensures underwriting, reserving, investments, and risk teams share a consistent vocabulary. Data capability is strengthened through automated geocoding refresh, standardized location schemas, and durable linkages to hazard layers and claims, with the same discipline applied to investment exposures where transition risk is material so concentrations can be monitored and stress-tested under scenarios. The deeper model build is initiated by integrating catastrophe vendor outputs into underwriting guidelines, reinsurance decisions, and accumulation controls, while starting internal vulnerability work in high-value segments (resilience attributes and quantified impacts). Reporting also matures from prototypes to consistent internal reporting and disclosure controls (International Sustainability Standards Board, 2023) aligned to a stable disclosure backbone (Task Force on Climate-related Financial Disclosures, 2017.)

Phase 3 (Days 366–730) is about making the plan defensible and auditable—turning climate insights into governed assumption changes and repeatable decisions. Climate capability is extended into underwriting authorities, actuarial assumption-setting, and investment mandates, with defined roles for model risk management and internal audit to review data controls and model overlays. Data moves from "where are we exposed?" to "why are we vulnerable?" through curated datasets that join exposure, hazard intensity measures, claims outcomes, and mitigation attributes, enabling credible experience analysis. The insurer completes climate-adjusted experience studies where signal is strong (for example, severity inflation, seasonality shifts, heat-related patterns) and expands internal vulnerability curves or adjustments so resilience features are reflected consistently with catastrophe-model vulnerability relationships. Reporting becomes decision-grade, with stable metrics over time (Task Force on Climate-related Financial

Disclosures, 2017), scenario results explicitly linked to risk appetite and management actions, and traceability back to governed data and models—supported by staged governance checkpoints at day 90, day 365, and day 730.

SUCCESS CRITERIA AND GOVERNANCE CHECKPOINTS

It is crucial to define success criteria as observable outcomes: improved exposure data quality, key metrics with owners and escalation thresholds, repeatable scenario analysis embedded in ORSA, and governed use of vendor CAT models with documentation, sensitivity testing, and disclosures that conform with your risk appetite.

Stage governance checkpoints

- By Day 90: approve ownership, scope, data standards, initial scenarios, and the metrics dashboard.
- By Day 365: approve the scenario set/cadence, risk appetite metrics and limits, and catastrophe model governance.
- By Day 730: approve climate-adjusted assumption changes in pricing/reserving/capital and confirm auditability of reporting and management actions.

CONCLUSION

In practice, a "minimum viable" climate risk integration roadmap succeeds when it turns climate risk from a narrative into a governed operating capability: one that is measurable, repeatable, and linked to concrete decisions in underwriting, pricing, reserving, capital, and investment management.

By sequencing quick wins in exposure intelligence and metrics with deeper builds in catastrophe model training, vulnerability analytics, and climate-adjusted experience work, insurers can improve near-term decision quality while building an auditable foundation for ORSA and external disclosure expectations.

REFERENCES

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