

Quant Atlas

BoundaryAtlas Use Cases

Institutional Workflows for Multi-Asset Price Structure Intelligence

Quant Atlas

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Abstract

This paper presents concrete institutional workflows for BoundaryAtlas, the Quant Atlas multi-horizon, multi-asset price structure dataset. BoundaryAtlas is framed around its target users, zone-based decision workflows, integration patterns, and operational outcomes. The objective is to show how the dataset can be consumed by systematic technical desks, discretionary portfolio managers, macro funds, risk teams, multi-asset researchers, and CTA teams without forcing a change in their existing investment process.

1 Executive Overview

BoundaryAtlas identifies high-stability price boundaries through volatility-anchored construction and confluence clustering. It produces timestamped support and resistance zones with explicit geometry, conviction tier, confluence information, breach probability, and associated structural statistics across configurable asset universes and multiple horizons.

The dataset is designed as a structural decision-support layer. It can support programmatic stop and target placement, trade filtering, multi-horizon context, cross-asset screening, breach-risk monitoring, and feature engineering for internal technical models. Its institutional value comes from converting chart-based structural analysis into a reproducible, auditable, and machine-readable process.

The default production delivery method is R2 object storage. S3, API, SFTP, and other agreed delivery methods remain available according to the client's infrastructure and workflow requirements.

2 BoundaryAtlas Use Cases

Product summary. BoundaryAtlas is a multi-horizon, multi-asset, zone-based directional signal. It identifies high-stability price boundaries through volatility-anchored construction and confluence clustering. Each signal carries zone geometry, conviction tier, and breach probability.

2.1 Target Users

- Systematic technical desks integrating zone-based decision logic.
- Discretionary traders and portfolio managers needing rule-based support and resistance references.
- Risk teams setting stop and take-profit levels for desk positions.
- Multi-asset macro funds using technical confluence as one input to thematic decisions.
- CTA desks operating breakout strategies that require programmatic boundary identification.

2.2 What BoundaryAtlas Measures

BoundaryAtlas measures the location and structural quality of active price boundaries. Each zone is represented as a bounded area rather than a single arbitrary price level, allowing the consuming firm to work with market structure in a form that reflects volatility and uncertainty.

Core fields can include:

- Zone type, identifying support or resistance.
- Upper and lower zone boundaries and volatility-adjusted zone width.
- Conviction tier and confluence source count.
- Distance from current price and near-zone status.
- Breach probability and historical hold-time statistics.
- Time horizon, instrument identifier, timestamp, and point-in-time quality controls.

2.3 Use Case 1: Programmatic Stop and Take-Profit Placement

A systematic equity or futures desk needs stop-loss and take-profit levels derived from market structure rather than arbitrary percentage offsets. BoundaryAtlas zones provide those levels.

Workflow.

1. The desk opens a position based on its own model.
2. BoundaryAtlas provides the active zones around current price for that instrument.
3. The stop is placed at the next zone opposite the trade direction, representing the boundary that would invalidate the move.
4. The take profit is set at the next zone in the trade direction.
5. As price moves and new zones become active, stops can trail to preserve realized gains.
6. Every stop and target placement remains auditable because the zone geometry that generated the level is logged with the trade.

Operational outcome. Stop and target placement is grounded in market structure with a fully auditable decision trail per trade. The process reduces operator subjectivity around level selection.

2.4 Use Case 2: Zone Confluence as a Trade Filter

A discretionary trader executes positions only when the investment thesis aligns with strong BoundaryAtlas zones, meaning zones supported by a high confluence count.

Workflow.

1. The trader identifies a trade idea, such as a long position based on macro conviction.
2. BoundaryAtlas exposes the nearest support and resistance zones, including conviction tier and confluence count.
3. The trade is entered with a stop placed just beyond the nearest strong support zone.
4. If the zone breaches, the thesis is reviewed or invalidated under the desk's pre-committed rules.
5. If price holds, the trade can run toward the next BoundaryAtlas resistance zone.
6. Strong zones gate the trade, while trades located around weak structural references can be deprioritized.

Operational outcome. The trader executes a smaller, more selective set of positions whose risk parameters are defined before entry.

2.5 Use Case 3: Multi-Horizon Regime Context for Thematic Trades

A macro fund makes a multi-month thematic trade. BoundaryAtlas monthly and weekly horizons provide structural context, while daily and hourly horizons provide execution timing.

Workflow.

1. The macro thesis is formed independently on the selected instrument.
2. Monthly BoundaryAtlas identifies the structural resistance and support zones that define the thematic range.
3. Weekly BoundaryAtlas reveals intermediate consolidation ranges within the structural levels.
4. Daily and hourly BoundaryAtlas are used to time entries around strong lower-horizon zone interactions.
5. The position is managed against the higher-horizon zones, while scaling decisions are informed by lower-horizon structure.

Operational outcome. The fund receives a unified zone framework across the macro horizon and the execution horizon. The same engine supports all selected cadences, reducing the need to combine unrelated structural tools.

2.6 Use Case 4: Cross-Asset Technical Screening

A multi-asset desk wants a regular input identifying which instruments are trading at major structural levels. BoundaryAtlas provides the screening layer.

Workflow.

1. The feed ingests BoundaryAtlas signals across the configured universe, such as equities, FX, commodities, and indices.
2. The screening dashboard surfaces instruments where current price is at or near a strong support or resistance zone.
3. The portfolio manager reviews the shortlist to identify structurally relevant instruments.
4. Conviction tier and confluence count filter the list to a manageable size.
5. Selected instruments are escalated to the desk's deeper fundamental, macro, technical, or quantitative process.

Operational outcome. The desk receives a reproducible idea-generation funnel grounded in price structure across the selected asset universe. This replaces ad hoc manual chart browsing with a systematic filter.

2.7 Use Case 5: Breach-Rate Monitoring for Risk Management

A risk team wants to monitor which positions have approached or breached structurally important levels. BoundaryAtlas breach probability data feeds the alert system.

Workflow.

1. BoundaryAtlas signals include a breach probability for each active zone.
2. The risk system maps firm positions to BoundaryAtlas zones for each held instrument.
3. As price approaches a zone, the system combines distance, position size, conviction, and breach probability.
4. Predefined threshold crossings trigger a desk notification.
5. The desk decides whether to maintain, hedge, reduce, or close the exposure.

Operational outcome. BoundaryAtlas creates a structured risk-monitoring layer that converts an approach to a material price boundary into an actionable review before or during the interaction.

2.8 Use Case 6: Backtest Variable Enrichment for Technical Strategies

A research team developing technical strategies, including mean-reversion or breakout models, uses BoundaryAtlas zones as features in candidate models.

Workflow.

1. The research environment ingests the historical BoundaryAtlas archive.
2. Candidate features include distance to the nearest strong zone, current-zone confluence count, zone width, prior hold duration, and historical breach behavior.
3. Models are tested with and without the BoundaryAtlas feature set.
4. Features that improve out-of-sample fit, conditional performance, or stability are retained.
5. New strategies use the dataset as a structured feature input rather than rebuilding zone detection internally.

Operational outcome. The research team receives a pre-built technical feature library, reducing the engineering cost and methodological inconsistency of constructing structural zones in house.

2.9 Integration Patterns

- **Multi-stream delivery:** Each selected horizon, including hourly, daily, weekly, and monthly, can be delivered as a separate stream. Consumers subscribe only to the horizons they require.
- **Default delivery:** R2 object storage, with a separate stream for each selected horizon.
- **Alternative delivery:** S3 with notification support, API, SFTP, and other agreed methods are available according to the client workflow.
- **Universe customization:** Subscribers configure their asset universe. Coverage and commercial terms scale according to the selected instruments, horizons, cadence, and identifier-mapping requirements.
- **Core payload:** Timestamp, asset, horizon, zone type, upper and lower boundaries, zone width, conviction, confluence information, proximity status, breach probability, and relevant quality flags.

2.10 Why BoundaryAtlas

- Converts price structure into a systematic, ticker-mapped, and machine-readable dataset.
- Uses bounded zones rather than arbitrary single-price levels.
- Applies volatility-anchored construction and confluence-based quality scoring.
- Produces conviction tiers and breach-probability information before or during zone interaction.
- Supports multiple horizons under one consistent methodology, from tactical execution to structural portfolio context.
- Exposes zone geometry and structural statistics for downstream attribution and auditability.
- Uses a pre-committed, falsification-grade validation framework calibrated by asset class.
- Can be consumed as a decision-support layer, risk input, screening feed, or research feature without requiring clients to trade it directly.

3 Conclusion

BoundaryAtlas is designed to fit into institutional workflows without requiring systematic desks, portfolio managers, macro teams, researchers, or risk functions to abandon their existing models or discretionary processes. It can be consumed as a structural feature set, trade filter, stop and target reference, cross-asset screening feed, multi-horizon context layer, or breach-risk monitoring input.

Its role is narrowly defined: to identify and quantify high-stability support and resistance zones through a consistent, point-in-time framework. Each workflow can be logged, attributed, and evaluated against the consuming firm's own process, preserving operational auditability from research through production use.

This document is intended for institutional product evaluation and research workflow discussion. It does not constitute investment advice or a recommendation to trade any financial instrument.