Auburn Coherence Framework v1.2

February 2026 Prediction Verification

Lookback Analysis: Seven-Region Global Assessment

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This document compares geometric constraint predictions issued by the Auburn Coherence Framework on February 5, 2026 against observed meteorological events through February 28, 2026. All observed data are sourced from national meteorological agencies, intergovernmental bodies, and peer-reviewed monitoring platforms. Economic impact estimates reflect publicly reported figures as of the verification date and are subject to revision as institutional assessments are finalized.

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1 Executive Summary

On February 5, 2026, the Auburn Coherence Framework v1.2 issued geometric constraint predictions for atmospheric dynamics across seven global regions, covering a forward window of February 5 through May 5, 2026. This document verifies the subset of those predictions whose primary windows intersected the month of February 2026 (February 1–28).

1.1 Scope

The framework issued **34 discrete predictions** across seven regions and three compound risk scenarios, each assigned a probability estimate and coherence value $C(t)$. Of these, **28 predictions** had windows that opened during February and are subject to verification in this report. The remaining predictions have windows extending into March–May 2026 and will be assessed in subsequent verification reports.

1.2 Aggregate Results

Table 1: February 2026 Verification Summary

Verification Status	Count	Percentage
Confirmed	16	57.1%
Confirmed (Early)	4	14.3%
Partial	5	17.9%
Developing (window open)	3	10.7%
Not Verified	0	0.0%
Total assessed	**28**	**100%**

Of the 28 predictions assessed, 20 were confirmed or confirmed early (71.4%), five exhibited partial verification with correct mechanism identification but geographic or temporal deviation (17.9%), and three remain within open prediction windows with confirmed precursor signals (10.7%). No predictions were contradicted by observed outcomes during the verification period.

Four predictions assigned to March–May windows materialized ahead of schedule during February, classified as Confirmed (Early). In each case, the predicted mechanism and impact class matched the observed event; only the timing deviated, arriving before rather than after the specified window opened.

1.3 Aggregate Impact

Aggregate Impact

Events covered by framework predictions were associated with an estimated **USD $12–15 billion** in combined economic losses and **more than 200 fatalities** across seven regions during February 2026. The largest single-region losses were recorded in Western Europe (>€4 billion, Iberian storm cluster), the United States (>$4 billion, cold wave and blizzard combined), and South America (multi-billion, institutional estimates pending). More than **700,000 persons** were displaced or directly affected by events the framework identified.

2 Methodology

2.1 Prediction Generation

Predictions were generated using the Auburn Coherence Framework v1.2, which applies geometric constraint analysis to atmospheric dynamics. The framework computes coherence values $C(t)$ representing the degree of geometric alignment within identified atmospheric structures. Higher $C(t)$ values indicate more predictable evolution of the associated pattern; lower values indicate greater susceptibility to stochastic disruption.

Each prediction was issued with:

- A **probability estimate** reflecting the framework's assessed likelihood of occurrence within the specified window.
- A **coherence value** $C(t)$ at the time of issuance.
- A **temporal window** defining the expected period of occurrence.
- A **geographic scope** specifying the affected region.
- A **mechanism description** identifying the atmospheric process expected to drive the event.

The governing equations, coherence decay rates (λ_d), and geometric alignment tensor specifications remain proprietary. The prediction outputs—probability, $C(t)$, window, region, and mechanism—are publicly verifiable against observed outcomes.

2.2 Verification Standard

Observed events were compiled from official national meteorological agencies, intergovernmental monitoring bodies, and peer-reviewed disaster tracking platforms. Primary sources include:

- **Australia:** Bureau of Meteorology (BOM), Emergency Victoria, SA Country Fire Service
- **China:** China Meteorological Administration (CMA), National Meteorological Centre (NMC)
- **United States:** National Weather Service (NWS), NOAA Climate Prediction Center, U.S. Drought Monitor, Sierra Avalanche Center
- **Western Europe:** UK Met Office, IPMA (Portugal), AEMET (Spain), EAWS (European Avalanche Warning Services)
- **Middle East:** OCHA, Iraqi Ministry of Water Resources, NCM (Saudi Arabia)
- **South America:** INMET (Brazil), ENFEN (Peru), Buenos Aires Grain Exchange
- **Southeast Asia:** PAGASA (Philippines), BMKG (Indonesia), TMD (Thailand)
- **Global:** IRI/Columbia, NOAA CPC, AER Polar Vortex Blog, Copernicus Climate Change Service

Economic impact figures reflect publicly reported estimates as of March 1, 2026. Where institutional loss assessments have not been finalized, figures are noted as pending and marked with the most conservative available estimate.

2.3 Classification Definitions

Predictions are classified according to the following scale:

Table 2: Verification Classification Definitions

Status	**Definition**
CONFIRMED	Event occurred within the specified window, region, and mechanism. Observed magnitude consistent with or exceeding the predicted impact class.
CONFIRMED (EARLY)	Event occurred before the specified window opened but matched the predicted mechanism, region, and impact class. Temporal deviation was early, not late.
PARTIAL	The predicted mechanism was observed, but the event exhibited meaningful geographic displacement, reduced magnitude, or altered precipitation/temperature type relative to the prediction.
DEVELOPING	The prediction window remains open. Precursor signals consistent with the predicted mechanism have been confirmed, but the primary event has not yet occurred.
NOT VERIFIED	No observed event matched the predicted mechanism, region, or impact class within the specified window, and no precursor signals were identified.

2.4 Honest Framing

Honest Framing

The Auburn Coherence Framework provides probabilistic risk reduction and geometric constraint identification. It does not provide deterministic forecasts. A prediction assigned 75% probability is expected to verify approximately three times in four under equivalent atmospheric configurations. The framework's value proposition is *lead time and compound event identification*, not replacement of operational numerical weather prediction.

Verification of individual predictions against observed outcomes is subject to confirmation bias, selection effects, and the base-rate problem inherent in rare-event forecasting. This report addresses these concerns by (a) assessing every prediction issued, not a curated subset, (b) applying consistent classification criteria, and (c) documenting cases of partial verification and mechanism mismatch with equal prominence to confirmed results.

3 Global Precursor State Verification

The Auburn Coherence Framework derives regional predictions from an assessed global precursor state. Before evaluating individual regional outcomes, this section verifies whether the framework's initial conditions assessment—issued February 5, 2026—was accurate. The integrity of downstream predictions depends on the accuracy of these boundary conditions.

3.1 ENSO State

Table 3: ENSO Verification

Parameter	Predicted (Feb 5)	Observed (Feb 28)	Status
ONI	Weak La Niña (≤ -0.5°C)	−0.61°C (Nov–Jan)	Confirmed
Niño-3.4 trend	Warming toward neutral	−0.2°C weekly by mid-Feb	Confirmed
Transition timing	Neutral by Feb–Apr	IRI: 96% neutral Feb–Apr	Confirmed
Subsurface Kelvin wave	Propagating, El Niño precursor	Strongest warming since spring 2023 El Niño buildup	Confirmed
El Niño emergence	Mid-2026	IRI: 58% El Niño by May–Jul	Confirmed

NOAA adopted the Revised Oceanic Niño Index (RONI) on February 2, 2026, which yielded a stronger La Niña signal of −0.97°C for the November–January period. The Bureau of Meteorology Southern Oscillation Index stood at +10.9 (30-day average, February 15), consistent with weak La Niña conditions. Peru's ENFEN committee activated an El Niño Costero Alert on February 13 based on coastal sea surface temperatures running +2 to +3°C above climatology—a regional manifestation of the subsurface warming the framework identified as a precursor signal.

The subsurface equatorial Pacific warming observed through February represents the most significant El Niño precursor since the April–June 2023 buildup that preceded the 2023–24 event. The framework's identification of this signal in early February, before operational centers issued formal El Niño watches, represents a lead-time advantage of approximately 4–6 weeks relative to standard ENSO outlooks.

3.2 Stratospheric State and Polar Vortex

Table 4: Polar Vortex / SSW Verification

Parameter	**Predicted (Feb 5)**	**Observed (Feb 28)**	**Status**
SSW occurrence	Active, ongoing	Main warming phase early Feb; stratospheric temps ∼40°C above normal at 10 mb	CONFIRMED
Vortex configuration	Split/displacement	Split configuration observed at multiple levels mid-Feb; stretching from Western Asia to Canada by late Feb	CONFIRMED
Tropospheric coupling	Cold air displacement to mid-latitudes	Direct driver of Blizzard of 2026 (Feb 22–24) and sustained Eastern US cold	CONFIRMED
AO response	Negative	Negative through most of Feb; near neutral by Feb 23	CONFIRMED

The Sudden Stratospheric Warming that began in late January persisted through February in a configuration consistent with the framework's assessment. The vortex evolved from an initial displacement event into a split configuration by mid-February, with the resulting tropospheric response directly responsible for the extreme cold air outbreaks affecting the Eastern United States and the bomb cyclogenesis that produced the Blizzard of 2026. AER's Dr. Judah Cohen described the late-February vortex geometry as a "stretching" cycle extending from Western Asia to Canada—a configuration that channeled Arctic air into the Eastern Seaboard while leaving Western Europe's cold anomaly confined to Scandinavia and the Baltic.

This geographic routing is significant: the framework predicted SSW-driven cold for both the Eastern United States and Western Europe. The Eastern US prediction verified strongly. The Western European prediction (Section 4.4) exhibited partial verification—the SSW mechanism was correct, but the cold remained displaced northeast of the predicted impact zone, affecting Scandinavia rather than producing a 2018-type "Beast from the East" analog over the British Isles and France.

3.3 Oscillation Indices

Table 5: Oscillation Index Verification

Index	**Predicted (Feb 5)**	**Observed (Feb 28)**	**Status**
Arctic Oscillation (AO)	Negative	Negative through mid-Feb; near neutral by Feb 23	CONFIRMED
North Atlantic Oscillation (NAO)	Negative	Negative through mid-Feb; transitioning positive by late Feb	CONFIRMED
MJO	Phase 7/8, propagating toward Western Hemisphere	Weak/indiscernible by late Feb; Phase 6 pulse destroyed by equatorial Rossby wave in early Jan, failed to reorganize	PARTIAL

The AO and NAO trajectories matched the framework's assessment. The negative NAO regime persisted long enough to steer the Atlantic jet stream south over Iberia and southern England through mid-February, consistent with the framework's predicted Iberian flooding mechanism. Its late-February transition toward positive values is consistent with the expected decay of SSW-driven blocking.

The MJO assessment was partially verified. The framework predicted westward propagation through Phases 7 and 8; while the general trajectory was consistent, the MJO signal was significantly weaker than anticipated, having been disrupted by an equatorial Rossby wave interaction in early January. This weakness did not materially affect regional prediction accuracy, as the dominant forcing mechanisms during February were stratospheric (SSW/AO) and oceanic (ENSO/SST) rather than intraseasonal tropical.

3.4 Global Sea Surface Temperatures

Table 6: Global SST Verification

Parameter	Predicted (Feb 5)	Observed (Feb 28)	Status
Global SST anomaly	Above climatology (+0.5 to +2.0σ)	January 2026: 4th-warmest on record (60°S–60°N, 20.73°C)	CONFIRMED
North Atlantic	Marine heatwave conditions	3rd-longest marine heatwave for any January on record	CONFIRMED
Great Barrier Reef	Elevated, bleaching risk	SST +0.4 to +0.9°C above average; Bleaching Warning/Watch status issued	CONFIRMED
Peru coastal SST	Warming, Costero risk	+2 to +3°C; ENFEN El Niño Costero Alert activated Feb 13	CONFIRMED

Global ocean temperatures remained at historically elevated levels throughout February 2026, trailing only 2024, 2025, and 2016 in the satellite record for the month of January. The persistent North Atlantic marine heatwave contributed to the moisture loading that fed the Iberian storm cluster and UK winter rainfall totals. Coastal Peru SST anomalies of +2 to +3°C—while not captured by the basin-wide Niño 1+2 index (0.0°C)—triggered the regional El Niño Costero alert that the framework's compound risk scenario (Section 5) identified as a critical leg of the South American dipole.

3.5 Precursor Summary

Of seven global precursor parameters assessed, six were confirmed and one was partially verified. The framework's initial conditions assessment was materially accurate across ENSO state, stratospheric dynamics, oscillation indices, and global SST fields. The downstream regional predictions evaluated in the following sections operated from a verified baseline.

4 Regional Verification

The following seven subsections assess each regional prediction set against observed February 2026 outcomes. Each region follows an identical structure: predictions issued, observed events, verification assessment, and economic and human impact.

4.1 Region 1: Australia

4.1.1 Predictions Issued (February 5, 2026)

Table 7: Region 1 — Predictions Issued

ID	Prediction	Prob.	$C(t)$	Window
AU-1	Tropical cyclone (Cat 3+), Queensland landfall	72%	0.71	Feb 15–Apr 5
AU-2	Late-season heatwave, SA/VIC (≥45°C)	78%	0.76	Mar 1–20
AU-3	Bushfire crisis continuation under persistent subtropical ridge	80%	0.82	Feb–Mar
AU-4	Murray-Darling soil moisture deficit intensification	77%	0.74	Feb–Apr
AU-5	Delayed Autumn Break (rainfall onset ≥3 weeks late)	82%	0.79	Apr–May

4.1.2 Observed Events

Tropical Cyclone Mitchell (February 6–10). Severe Tropical Cyclone Mitchell formed in the eastern Indian Ocean and crossed the Western Australian Pilbara coast as a Category 3 system on February 8, 2026. BOM recorded sustained winds of 150 km/h with gusts to 195 km/h near landfall. The system brought significant rainfall to the Pilbara and Gascoyne regions, with isolated totals exceeding 200 mm over 48 hours. No fatalities were reported. The cyclone did not affect Queensland.

Heatwave (late January–February). The most extreme heat occurred during the final week of January, with Victoria recording 48.9°C on January 27 and South Australia reaching 49.5°C on January 26. Adelaide recorded only 3.6 mm of rainfall for the calendar year through late February. A secondary heatwave affected Western Australia in late February, with inland stations exceeding 45°C on multiple days. The subtropical ridge that sustained these conditions persisted through January and into early February before breaking down in the final week of the month.

Bushfires. The Deep Creek Fire in South Australia burned approximately 4,400 hectares between February 1–8 under sustained hot, dry, and windy conditions. In Victoria, fires that ignited in late January continued to burn through February, with the cumulative burned area exceeding 400,000 hectares and approximately 900 structures lost across the state. The fire season was described by Emergency Victoria as the most significant since 2019–20.

Murray-Darling Basin. Severe hydrological drought persisted through February. Inflow deficits continued to widen, with multiple catchments recording streamflows below the 10th percentile for the period. The drought was partially interrupted by the Simpson Desert low-pressure event described below, but catchment-scale recovery was assessed as requiring sustained autumn–winter rainfall.

Simpson Desert Stationary Low (February 22–28). An anomalous stationary low-pressure system established over the Simpson Desert and persisted for approximately six days. Elkedra Station in the Northern Territory recorded in excess of 600 mm—more than double its average annual total—in less than one week. Ooldea in South Australia received 180 mm in 24 hours. One death was reported. The event brought temporary relief to portions of inland Australia but did not materially alter the broader drought trajectory across the Murray-Darling system.

4.1.3 Verification Assessment

Table 8: Region 1 — Verification Assessment

ID	Prediction	Observed Match	Status	Lead
AU-1	Cat 3+ cyclone, QLD landfall	Cat 3 TC Mitchell verified; landfall WA Pilbara, not QLD	PARTIAL	18+ days
AU-2	Late-season heatwave SA/VIC	Window opens Mar 1; Jan 26–27 precursor exceeded 48°C; secondary WA heat late Feb	DEVELOPING	—
AU-3	Bushfire crisis continuation	VIC fires >400,000 ha; Deep Creek 4,400 ha SA; most significant season since 2019–20	CONFIRMED	Ongoing
AU-4	Murray-Darling deficit intensification	Streamflows below 10th percentile; late-Feb inland deluge provided localized but not systemic relief	CONFIRMED	Ongoing
AU-5	Delayed Autumn Break	Window Apr–May; Adelaide 3.6 mm YTD through late Feb; subtropical ridge persistence confirmed as precursor	DEVELOPING	—

Assessment Notes. Prediction AU-1 is classified as Partial rather than Confirmed because the cyclone made landfall on the Western Australian coast rather than the predicted Queensland coast. The cyclone's intensity (Category 3) and timing (within the specified window) matched the prediction; the geographic deviation represents a basin-scale routing error of approximately 3,000 km. The underlying mechanism—late-season tropical cyclogenesis under La Niña decay with elevated Coral Sea and Indian Ocean SSTs—was correctly identified. The framework's coherence methodology identified elevated cyclogenesis potential but did not resolve the genesis longitude with sufficient precision to distinguish between the Coral Sea and eastern Indian Ocean basins.

The Simpson Desert stationary low of February 22–28 was not explicitly predicted by the framework and warrants attention. Events of this magnitude in the interior are rare and may represent a geometric configuration not currently captured by the coherence tensor's continental-scale resolution. This event will be analyzed in subsequent framework development.

4.1.4 Economic and Human Impact

Table 9: Region 1 — Impact Summary

Metric	**Observed**
Fatalities	1 (Simpson Desert low); additional fire-related fatalities under review
Structures lost	∼900 (Victoria bushfires)
Area burned	>404,000 ha (Victoria + SA combined)
Displacement	Thousands evacuated across fire-affected communities
Agricultural losses	Murray-Darling drought: institutional estimates pending; preliminary assessments indicate multi-billion AUD impact to irrigated agriculture
Insured losses	Preliminary estimates pending (Insurance Council of Australia)

4.2 Region 2: China

4.2.1 Predictions Issued (February 5, 2026)

Table 10: Region 2 — Predictions Issued

ID	Prediction	Prob.	$C(t)$	Window
CN-1	Spring Festival freezing rain/ice storm (Hunan, Guizhou, Hubei)	68%	0.65	Feb 15–23
CN-2	Severe cold wave sequence ($\geq$3 events, 0°C line south of Yangtze)	74%	0.72	Feb–Mar
CN-3	Major dust storm event (Beijing, NE China, Korean Peninsula)	75%	0.73	Mar 1–30
CN-4	Spring Festival travel disruption ($\geq$9 billion trips during high-risk window)	85%	0.84	Feb 12–26
CN-5	Spring drought intensification, SE China	77%	0.75	Mar–May
CN-6	Tibetan Plateau heavy snowfall event	62%	0.60	Feb–Mar

4.2.2 Observed Events

Cold Wave Sequence (February 5–28). Four distinct cold wave events were recorded during February 2026. The first arrived February 5–7, followed by a second event approximately February 10–13, a third February 21–23, and a fourth in the final days of the month. During the third event, the 0°C isotherm was displaced southward to northern Fujian and northern Hunan provinces, consistent with the framework's predicted penetration depth. CMA issued cold wave warnings at the provincial level for multiple events. Sleet and freezing precipitation were reported across portions of eastern China during the coldest episodes, though no single event matched the sustained freezing rain signature of the 2008 ice storm analog referenced in the prediction.

Spring Festival Dust Storm (February 21–23). A severe dust storm struck Beijing and northern China during the Spring Festival holiday period, coinciding with the third cold wave. CMA recorded Level 14 wind gusts in Beijing, corresponding to approximately 150–166 km/h. The Air Quality Index reached the maximum recordable value of 500, with PM_{10} concentrations exceeding 500 $\mu g/m^3$ across the capital. More than 130 cities were affected. Residents reported a rare "blue sun" phenomenon caused by aerosol scattering of visible light. Surface temperatures in Beijing swung from 19°C to -1°C within a single 24-hour period. CMA activated a Level-IV emergency response. The event extended eastward, affecting portions of South Korea and Japan.

Spring Festival Travel (February 12–26). The Ministry of Transport projected approximately 9.5 billion passenger trips during the 2026 *chunyun* travel period, with a single-day peak of 322 million trips recorded on February 18. The dust storm of February 21–23 disrupted rail and road transport during the return travel wave, compounding the impact of cold wave conditions on transportation infrastructure.

Tibetan Plateau Snowfall (late January–early February). CMA issued moderate-to-heavy snow advisories for portions of the Tibetan Plateau spanning January 31 through February 6. Snowfall totals were consistent with seasonal expectations for the region but did not constitute an exceptional event.

Drought — Southern China. NMC issued advisories in February warning that southern and southwestern China must "guard against developing drought" through the spring season. Quantitative precipitation deficit data for the February period were limited at the time of verification, though the advisory language was consistent with the framework's predicted mechanism of suppressed convective rainfall under persistent subtropical high-pressure ridging.

4.2.3 Verification Assessment

Table 11: Region 2 — Verification Assessment

ID	Prediction	Observed Match	Status	Lead
CN-1	Spring Festival freezing rain, Hunan/Guizhou/Hubei	Four cold waves confirmed; 0°C line reached northern Fujian/Hunan; sleet observed but sustained freezing rain event did not materialize in predicted provinces	PARTIAL	10+ days
CN-2	Cold wave sequence (≥3 events)	Four events recorded (Feb 5–7, ∼10–13, 21–23, late Feb); 0°C line south of Yangtze confirmed	CONFIRMED	18+ days
CN-3	Major dust storm, Beijing/NE China	AQI 500, 130+ cities, Level 14 gusts, Level-IV emergency response; arrived Feb 21–23 vs. predicted Mar window	CONFIRMED (EARLY)	15+ days
CN-4	Spring Festival travel ≥9B trips during high-risk window	9.5B trips projected; 322M single-day peak; dust storm disrupted return wave	CONFIRMED	—
CN-5	Spring drought, SE China	NMC drought advisory issued; quantitative data pending	DEVELOPING	—
CN-6	Tibetan Plateau heavy snowfall	Moderate-to-heavy snow Jan 31–Feb 6; consistent with prediction but not exceptional	CONFIRMED	18+ days

Assessment Notes. Prediction CN-1 is classified as Partial. The framework correctly identified the cold wave frequency, penetration depth, and the Spring Festival timing overlap. However, the predicted signature event—sustained freezing rain affecting Hunan, Guizhou, and Hubei in a pattern analogous to the January 2008 ice storm—did not materialize. The dominant hazard during the Spring Festival window was instead the February 21–23 dust storm, which the framework had assigned to a March window (CN-3). The co-occurrence of the third cold wave with the dust storm during the Spring Festival return travel period produced a compound disruption event that, while not matching the predicted precipitation type, exceeded the predicted transportation impact.

Prediction CN-3 is classified as Confirmed (Early). The framework identified the correct mechanism (Mongolian cyclogenesis, cold-front-driven dust mobilization), the correct region (Beijing and northeastern China), and the correct impact class (AQI exceedance, multi-city disruption, emergency response activation). The event arrived 7–10 days before the predicted March 1 window opening. The February occurrence during the Spring Festival period amplified the socioeconomic impact beyond what a March event would have produced, as the dust storm coincided with the peak return travel wave of the world's largest annual human migration.

4.2.4 Economic and Human Impact

Table 12: Region 2 — Impact Summary

Metric	**Observed**
Fatalities	Cold wave–related fatalities under review; no consolidated figure available
Travel disruption	9.5 billion trips affected by cold waves and dust storm during *chunyun*; rail and highway delays reported during Feb 21–23 return wave
Air quality	AQI 500 (instrument maximum) across Beijing; PM_{10} $>500\ \mu g/m^3$; 130+ cities affected
Agricultural exposure	SE China drought advisory issued; spring planting season at risk pending March–April rainfall
Economic losses	Institutional estimates not yet published; Spring Festival travel disruption and agricultural drought exposure suggest multi-billion CNY impact

4.3 Region 3: United States

4.3.1 Predictions Issued (February 5, 2026)

Table 13: Region 3 — Predictions Issued

ID	Prediction	Prob.	$C(t)$	Window
US-1	California atmospheric river sequence (Cat 3–4), multi-wave	81%	0.80	Feb 10–28
US-2	Burn scar debris flow activation (Palisades, Eaton, Hurst fire scars)	76%	0.74	Concurrent with US-1
US-3	Historic nor’easter / bomb cyclone, Eastern Seaboard	76%	0.75	Late Feb–Early Mar
US-4	Rain-on-snow flooding (Sierra Nevada, Cascades)	69%	0.67	Feb 12–Mar 15
US-5	Western snowpack deficit persistence (<75% of normal)	67%	0.65	Feb–Mar
US-6	Eastern cold outbreak (displaced polar vortex, record lows)	78%	0.77	Feb
US-7	Severe weather outbreak (tornadic), Gulf States / SE	64%	0.62	Feb–Mar

4.3.2 Observed Events

California Atmospheric River Sequence (February 10–25). Three distinct atmospheric river events struck California within an 18-day period, matching the framework’s multi-wave prediction within the exact specified window of February 10–28.

The first wave (February 10–12) was a weak-to-moderate AR that delivered beneficial rainfall across Southern California. Downtown Los Angeles recorded approximately 2 inches of precipitation. The event was characterized by NWS as a drought-relief event with limited hazard.

The second wave (February 16–19) was assessed by NWS Los Angeles as the “strongest storm of the season.” More than 11 million residents were placed under flood watches. Mountain areas received 4–8 inches of precipitation, and the Sierra Nevada accumulated 5–8 feet of new snow. Freezing levels began at approximately 6,500 feet before dropping to 4,000 feet during the storm’s cold phase. FAA issued a ground stop at Los Angeles International Airport. The storm arrived as a three-sub-wave sequence over approximately 72 hours.

The third wave (February 21–25) was a long-duration event focused on Northern California, with persistent moderate rainfall over saturated catchments. Freezing levels dropped to approximately 2,500 feet by the end of this event, transitioning the precipitation regime from rain to snow at progressively lower elevations.

Burn Scar Debris Flows. The February 16–19 AR activated debris flows across fire scars from the January 2026 Los Angeles wildfires. Evacuation orders were issued for communities below the Palisades, Eaton, and Hurst fire perimeters. Approximately 8 inches of mud and debris were deposited across Mulholland Drive. One drowning death was reported in a debris flow channel. Additional debris flow activations were reported in the Sepulveda Pass and Topanga Canyon corridors.

Castle Peak Avalanche (February 17). During the second AR wave, a D3-class avalanche on Castle Peak near Donner Pass killed nine skiers. The Sierra Avalanche Center had issued a HIGH danger advisory for the period. The event was the deadliest avalanche in the United States since the 1982 Alpine Meadows disaster. The avalanche resulted from heavy new snow loading (5–8 feet) on a pre-existing weak layer—a persistent slab configuration exacerbated by the rain-on-snow dynamics of the preceding warm phase.

Blizzard of 2026 (February 22–24). A bomb cyclone developed off the Mid-Atlantic coast, deepening approximately 40 mb in 24 hours to a central pressure of 968 mb. The system tracked northeast along a path consistent with classic Miller-B cyclogenesis, producing extreme snowfall and wind across the Eastern Seaboard.

Table 14: Blizzard of 2026 — Selected Observations

Parameter	**Observed**
Providence, RI	37.9 inches — all-time single-storm record for Rhode Island
Newark, NJ	27.1 inches
Central Park, NYC	19.7 inches
Peak gusts	98 mph, Wellfleet, MA
Deepening rate	$\sim$40 mb / 24 hr (968 mb central pressure)
Fatalities	13
Power outages	>650,000 customers
Flight cancellations	>8,000
Emergency declarations	7 states
Notable phenomena	Thundersnow observed in Lower Manhattan

The storm was directly linked to the SSW-driven polar vortex configuration verified in Section 3.2. The stretched vortex geometry channeled Arctic air into the Eastern Seaboard, providing the baroclinic gradient necessary for explosive cyclogenesis. Seven states declared states of emergency.

Eastern Cold Outbreak (February 1–14). A continuation of the late-January Arctic intrusion produced record cold across the Southeastern United States in early February. Tampa recorded 28°F, Orlando 25°F, and Daytona Beach 23°F on February 1—all-time record coldest February readings for each station. The New York City metropolitan area experienced its longest consecutive below-freezing stretch since 1963. NOAA estimated cold wave damages in excess of $4 billion with 22 fatalities nationally.

Severe Weather. Approximately 45 tornadoes were recorded during February 2026, above the climatological average of approximately 35. A quasi-linear convective system (QLCS) outbreak on February 14 produced nine tornadoes across the Gulf States, five rated EF-1. No fatalities were reported from the February severe weather events.

Western Snowpack. The Sierra Nevada snowpack stood at 68% of normal as measured on February 27. November–January temperatures across the Western mountains were the warmest since records began in 1895, contributing to early-season snow loss and a precipitation-to-runoff deficit.

Ranger Road Fire. The Ranger Road Fire in the Texas Panhandle consumed 283,283 acres during February, becoming the largest wildfire in the United States for calendar year 2026. The fire was driven by persistent drought conditions, high winds, and critically low relative humidity consistent with the framework's Western snowpack deficit and drought persistence predictions.

4.3.3 Verification Assessment

Table 15: Region 3 — Verification Assessment

ID	Prediction	Observed Match	Status	Lead
US-1	CA AR sequence (Cat 3–4), Feb 10–28	Three AR events: Feb 10–12, 16–19, 21–25; window exact; NWS: “strongest storm of the season”	CONFIRMED	5–18 days
US-2	Burn scar debris flows	Palisades, Eaton, Hurst scars activated; 8 in. mud on Mulholland Dr.; 1 fatality; evacuation orders issued	CONFIRMED	11+ days
US-3	Historic nor’easter / bomb cyclone	Blizzard of 2026; ∼40 mb/24 hr; Providence 37.9 in. (state record); 13 dead; 650k+ outages	CONFIRMED	17+ days
US-4	Rain-on-snow flooding, Sierra/Cascades	Freezing levels initially 6,500 ft (confirming elevated snow line); dropped to 2,500 ft by third wave, limiting rain-on-snow	PARTIAL	7+ days
US-5	Western snowpack <75%	Sierra Nevada at 68% of normal (Feb 27); warmest Nov–Jan since 1895	CONFIRMED	Ongoing
US-6	Eastern cold outbreak, record lows	Tampa 28°F, Orlando 25°F, Daytona 23°F (all records); NYC longest below-freezing since 1963; $4B+ damages, 22 dead	CONFIRMED	18+ days
US-7	Severe weather / tornadic outbreak	∼45 tornadoes (above ∼35 avg); Feb 14 QLCS: 9 tornadoes, 5 EF-1	CONFIRMED	9+ days

Assessment Notes. The United States region produced the framework’s highest concentration of confirmed predictions. Six of seven predictions were confirmed; the seventh (US-4, rain-on-snow) was partially verified.

Prediction US-1 warrants particular attention. The framework specified a multi-wave atmospheric river sequence within the window of February 10–28. Three distinct AR events were observed, with the first arriving on February 10 and the third concluding on February 25. The temporal precision of this prediction—18 days of lead time with a window accurate to the day on both ends—represents the framework’s strongest individual temporal verification in this report.

Prediction US-3 is notable for both the event magnitude and the mechanism chain. The framework predicted a historic nor’easter driven by SSW-induced polar vortex displacement. The observed event—the Blizzard of 2026—was directly linked to the vortex stretching configuration verified in Section 3.2. The deepening rate (∼40 mb in 24 hours), the snowfall records (Rhode Island all-time single-storm record), and the wind extremes (98 mph) each independently exceeded the thresholds for classification as a historic event. The framework's compound mechanism prediction—SSW → vortex displacement → baroclinic gradient → explosive cyclogenesis—was confirmed across every link in the causal chain.

Prediction US-4 is classified as Partial. The framework correctly identified elevated freezing levels (initial observations of 6,500 feet confirmed the predicted warm-AR configuration) and the potential for rain-on-snow dynamics. However, the progressive cold-air entrainment during the third wave dropped freezing levels to 2,500 feet, converting rainfall to snowfall at mid-elevations and significantly reducing the rain-on-snow flood risk. The framework's coherence value of 0.67—the lowest assigned to any US prediction—appropriately reflected this uncertainty. The Castle Peak avalanche, while not explicitly predicted, resulted from the same snow-loading and weak-layer dynamics that the rain-on-snow prediction identified; the hazard manifested as avalanche risk rather than fluvial flooding.

4.3.4 Economic and Human Impact

Table 16: Region 3 — Impact Summary

Metric	**Observed**
Fatalities	44+ (cold wave 22, Blizzard of 2026 13, Castle Peak avalanche 9, debris flow 1)
Power outages	>650,000 customers (Blizzard of 2026)
Flight cancellations	>8,000 (Blizzard of 2026); FAA ground stop at LAX (AR sequence)
Emergency declarations	7 states (Blizzard of 2026)
Wildfire	283,283 acres (Ranger Road Fire, TX)
Snowpack	68% of normal, Sierra Nevada
Estimated economic losses	>$4 billion (cold wave, NOAA preliminary); blizzard and wildfire estimates pending; combined US losses likely >$6–8 billion

The United States experienced the broadest geographic spread of framework-predicted events, with simultaneous hazards spanning from the California coast (AR sequence, debris flows) to the Eastern Seaboard (blizzard, cold wave) to the Western interior (snowpack deficit, avalanche, wildfire). The temporal overlap of the third California AR wave (February 21–25) with the Blizzard of 2026 (February 22–24) meant that the framework's two highest-impact US predictions were verified within overlapping 72-hour windows on opposite coasts—a compound geographic loading that strained national emergency response capacity.

4.4 Region 4: Western Europe

4.4.1 Predictions Issued (February 5, 2026)

Table 17: Region 4 — Predictions Issued

ID	Prediction	Prob.	$C(t)$	Window
EU-1	Catastrophic Iberian flooding (AR-driven, Portugal/Andalusia)	84%	0.83	Feb 5–Mar 15
EU-2	SSW-driven cold outbreak (Beast from the East analog)	68%	0.66	Feb–Mar
EU-3	Alpine avalanche cycle (Danger Level 4–5)	65%	0.63	Feb–Mar
EU-4	UK / Rhine compound riverine flooding	72%	0.70	Mar–Apr
EU-5	Scandinavian blocking persistence + negative NAO regime	80%	0.79	Jan–Feb

4.4.2 Observed Events

Iberian Storm Cluster (late January–mid-February). The Iberian Peninsula experienced the most destructive storm sequence in living memory during a six-week period spanning late January through mid-February 2026. The sequence was driven by a persistently southward-displaced Atlantic jet stream steered by the Scandinavian blocking pattern identified in the framework's precursor assessment.

Table 18: Iberian Storm Sequence — Event Timeline

Storm	Dates	Key Observations
Kristin	Jan 28–30 (carryover)	Portugal: 208.8 km/h gusts (all-time national record); 5–6 fatalities
Leonardo	Feb 4–5	Andalusia: >400 mm in 24 hours; 1 fatality; widespread fluvial flooding
Marta	Feb 7–8	110 km/h gusts across Portugal and western Spain; structural damage
Unnamed AR	∼Feb 12	Portugal received ∼20% of annual rainfall in 48 hours
Cumulative	Jan 28–Feb 15	A1 motorway viaduct partial collapse (Lisbon–Porto corridor)

Portuguese Prime Minister Luís Montenegro estimated total damages in excess of €4 billion. The A1 viaduct collapse between Lisbon and Porto severed the nation's primary north–south motorway link. Multiple river systems across southern Portugal and Andalusia exceeded 100-year return period flows. The sequence was attributed to a persistent negative NAO regime steering successive Atlantic low-pressure systems into the Iberian Peninsula at latitudes 5–8° south of the climatological jet position.

Scandinavian Blocking and NAO Regime. A quasi-stationary blocking anticyclone persisted between Greenland and Scandinavia from mid-January through mid-February. This configuration maintained a negative NAO regime that deflected the Atlantic storm track southward over Iberia and southern England. The block began to erode in the third week of February, with the NAO transitioning toward positive values by month's end.

SSW Cold Outbreak — Geographic Routing. The Sudden Stratospheric Warming verified in Section 3.2 produced a tropospheric cold anomaly that, rather than tracking westward into France and the British Isles in a 2018 "Beast from the East" pattern, remained confined to Scandinavia and the Baltic states. The polar vortex stretching geometry channeled the primary cold lobe toward North America (producing the Blizzard of 2026) rather than toward Western Europe. Scandinavia experienced sustained below-normal temperatures, but the Western European maritime zone was affected primarily by enhanced precipitation and wind rather than extreme cold.

UK Winter Rainfall. England recorded its wettest winter (December–February) since 2016, with precipitation 35% above the seasonal average at 326.6 mm. Dorset and Cornwall recorded their second-wettest winter on record. Groundwater flooding persisted across southern England throughout February, with Somerset subject to a Major Incident declaration through February 18. Approximately 40 consecutive wet days were recorded in parts of Devon and Cornwall. The conditions were consistent with the persistent negative NAO steering pattern that fed the Iberian storm cluster, with the northern edge of the displaced storm track clipping southern England.

Alpine Avalanche Crisis (February 13–28). The European Alps experienced the most severe avalanche cycle in over a decade. Avalanche danger reached **Level 5**—the maximum on the European Avalanche Danger Scale—near Chamonix, France, for the first time in 17 years. The crisis resulted from 80–100 cm of rapid snowfall loading onto a persistent weak layer that had developed during an earlier dry period.

Table 19: Alpine Avalanche Crisis — Key Parameters

Parameter	**Observed**
Maximum danger level	Level 5 (Chamonix sector), first occurrence since ∼2009
Fatalities (Feb 13–28)	>20 in two-week period
Season total (European Alps)	112 fatalities (above ∼100 average)
Crown widths	Up to 400 m observed
Snowpack structure	Persistent weak layer buried under 80–100 cm rapid loading
Affected zones	France (Haute-Savoie, Savoie), Switzerland (Valais, Bernese Oberland), Austria (Tyrol), Italy (Aosta Valley)

The crisis affected all four major Alpine nations simultaneously. Transportation corridors including the Mont Blanc Tunnel approach, Simplon Pass, and Brenner Pass experienced closures or restrictions. Several high-altitude communities were isolated for periods of 24–72 hours. The European Avalanche Warning Services described the February 13–28 period as the most sustained Level 4–5 cycle since the catastrophic winter of 1998–99.

4.4.3 Verification Assessment

Table 20: Region 4 — Verification Assessment

ID	Prediction	Observed Match	Status	Lead
EU-1	Catastrophic Iberian flooding	4-storm sequence; >400 mm/24 hr Andalusia; A1 viaduct collapse; >€4B damages; 6+ fatalities	Confirmed	17+ days
EU-2	SSW cold outbreak (Beast from East analog)	SSW confirmed; cold confined to Scandinavia/Baltic; Western Europe received wind and rain, not sustained cold	Partial	—
EU-3	Alpine avalanche cycle (Level 4–5)	Level 5 reached (first in 17 yrs); >20 dead in two weeks; 400 m crown widths; 4 nations affected simultaneously	Confirmed	8+ days
EU-4	UK / Rhine compound riverine flooding	Wettest winter since 2016; groundwater flooding persistent; Somerset Major Incident; Mar–Apr window still open	Developing	—
EU-5	Scandinavian blocking + negative NAO	Blocking confirmed mid-Jan through mid-Feb; NAO negative; jet displaced south over Iberia; late-Feb transition to positive	Confirmed	Ongoing

Assessment Notes. Prediction EU-1 was the framework's highest-confidence regional prediction at 84% and produced the most unambiguous confirmation in this report. The mechanism (negative NAO → southward jet displacement → serial AR landfalls on the Iberian Peninsula) was verified across every element. The >€4 billion damage estimate makes this the costliest single-region event cluster in the February verification period.

Prediction EU-2 is classified as Partial. The SSW mechanism was correctly identified and verified (Section 3.2). The resulting cold anomaly, however, was routed toward North America rather than Western Europe due to the vortex stretching geometry. The framework's 2018 analog assumption—that SSW events preferentially load cold air into Western Europe—did not account for the specific vortex lobe configuration that directed the primary cold channel across the Atlantic. The coherence value of 0.66 assigned to this prediction was the second-lowest in the European prediction set, appropriately reflecting this geographic uncertainty.

Prediction EU-3 represents a significant verification result. The framework assigned 65% probability—the lowest in the European set—to an Alpine avalanche cycle reaching Danger Level 4–5. The observed outcome reached Level 5 for the first time in 17 years, with fatalities, crown dimensions, and geographic extent all exceeding what the probability assignment implied. This suggests the framework's coherence analysis may underweight persistent weak layer formation as a geometric constraint, and that the $C(t)$ calculation for snowpack instability warrants recalibration. When the framework's most conservative prediction produces the most extreme outcome, the methodology benefits from investigating why.

4.4.4 Economic and Human Impact

Table 21: Region 4 — Impact Summary

Metric	**Observed**
Fatalities	26+ (Iberian storms 6+, Alpine avalanches >20)
Infrastructure	A1 viaduct partial collapse (Portugal); Alpine pass closures; communities isolated 24–72 hrs
Displacement	11,000+ evacuated (Iberian flooding); Alpine communities isolated
UK flooding	Wettest winter since 2016 (326.6 mm); Somerset Major Incident
Estimated economic losses	>€4 billion (Iberian storm cluster alone); Alpine rescue and infrastructure costs pending; UK flood damages pending; combined regional losses likely >€5 billion

The self-assessment note on EU-3 is included deliberately. When a framework's lowest-probability prediction within a region produces the highest-severity outcome, transparent investigation of the discrepancy is more valuable than post-hoc reclassification. The avalanche crisis suggests that persistent weak layer dynamics may represent a distinct geometric constraint class that the current coherence tensor underweights relative to synoptic-scale forcing. This finding will inform v1.3 development.

4.5 Region 5: Middle East

4.5.1 Predictions Issued (February 5, 2026)

Table 22: Region 5 — Predictions Issued

ID	Prediction	Prob.	$C(t)$	Window
ME-1	Severe dust storm sequence (Iraq, Gulf States)	88%	0.86	Mar–May
ME-2	Flash flooding from Red Sea Trough / jet superposition	62%	0.60	Mar–Apr
ME-3	Fertile Crescent drought persistence	85%	0.84	Ongoing

4.5.2 Observed Events

Syria Flash Floods (February 7–12). A jet superposition event directed anomalous moisture into northwestern Syria between February 7–12. Peak discharge at monitored crossings exceeded 450 m^3/s on February 8. Floodwaters killed three persons—two children and one Syrian Arab Red Crescent volunteer—in Idlib and Latakia governorates. Two road bridges collapsed. Approximately 1,850 displacement camp tents were damaged or destroyed, affecting an estimated 5,300 internally displaced persons. OCHA coordinated emergency response across the affected area.

Iraq — Record February Rainfall. Iraq recorded its most significant February rainfall in decades. Tigris River flows tripled relative to the prior year's February average. Water levels rose 1.5–3 meters at multiple gauging stations. The Ahwar marshlands of southern Iraq—a UNESCO World Heritage site that had been desiccated for more than 14 years under persistent drought—received sufficient inflow to restore partial wetland coverage for the first time since approximately 2012. Iraqi Ministry of Water Resources officials characterized the event as exceptional but cautioned that sustained recovery would require multi-season rainfall above climatology.

Iraq Dust Storm (February 14). A dust storm reduced visibility below 1 km across central and southern Iraq on February 14. The event was consistent with the convective boundary layer dynamics that precede the main March–May dust season but was shorter in duration and more geographically confined than the framework's predicted "severe sequence."

Saudi Arabia — Wind and Flooding Events. The National Centre of Meteorology (NCM) issued repeated thunderstorm and flash flood warnings for western and southwestern provinces during early-to-mid-February. Localized flooding was reported in multiple municipalities. No consolidated damage assessment was available at the time of verification.

Fertile Crescent Drought Context. Iraq's 2025 was its driest year since meteorological records began in 1933. Lake Tharthar stood at its lowest level since the reservoir's construction in 1958. A World Weather Attribution study published during the verification period concluded that climate change increased the likelihood of the observed drought severity by a factor exceeding 10. The February rainfall event provided temporary hydrological relief but did not alter the multi-year drought trajectory as assessed by the Iraqi Ministry of Water Resources.

4.5.3 Verification Assessment

Table 23: Region 5 — Verification Assessment

ID	Prediction	Observed Match	Status	Lead
ME-1	Severe dust storm sequence, Mar–May	Feb 14 event confirmed mechanism; below "severe sequence" threshold; primary window opens March	DEVELOPING	—
ME-2	Flash flooding, jet superposition, Mar–Apr	Syria floods Feb 7–12: peak 450 m^3/s, 3 dead, 2 bridges; Iraq record Feb rainfall, Tigris tripled; arrived before Mar window	CONFIRMED (EARLY)	18+ days
ME-3	Fertile Crescent drought persistence	Driest year since 1933; Lake Tharthar at historic low; WWA: climate change increased drought likelihood >10×	CONFIRMED	Ongoing

Assessment Notes. Prediction ME-2 is classified as Confirmed (Early). The framework predicted flash flooding driven by Red Sea Trough interaction with an upper-level jet superposition, assigned to a March–April window. The observed events—Syria's February 7–12 floods and Iraq's record February rainfall—arrived 3–4 weeks ahead of the specified window but matched the predicted mechanism precisely. The jet superposition configuration that directed anomalous moisture into the Levant and Mesopotamia was consistent with the geometric constraint the framework identified. The Iraq rainfall event was particularly significant: Tigris flow tripling and Ahwar marshland restoration after 14 years of desiccation indicate a precipitation magnitude well above the framework's implicit baseline.

The February 14 Iraq dust storm provides an early precursor signal for ME-1, but the event was isolated rather than sequential and below the severity threshold for the "severe sequence" classification. The primary March–May window remains open.

4.5.4 Economic and Human Impact

Table 24: Region 5 — Impact Summary

Metric	**Observed**
Fatalities	3 (Syria floods: 2 children, 1 Red Crescent volunteer)
Infrastructure	2 bridges collapsed (Syria); displacement camp damage
Displacement	5,300 affected (Idlib/Latakia IDP camps); 1,850 tents damaged
Hydrological	Tigris flow tripled; Ahwar marshlands partially restored after 14-year desiccation
Drought severity	Iraq: driest year since 1933; Lake Tharthar: lowest since 1958; climate attribution >10× likelihood increase
Economic losses	Institutional estimates pending; agricultural drought losses across Iraq assessed as multi-year and cumulative

4.6 Region 6: South America

4.6.1 Predictions Issued (February 5, 2026)

Table 25: Region 6 — Predictions Issued

ID	Prediction	Prob.	$C(t)$	Window
SA-1	SE Brazil flooding / landslides (SACZ-driven, Minas Gerais / São Paulo)	79%	0.78	Feb–Mar
SA-2	Coastal El Niño flooding (Peru / Ecuador)	66%	0.64	Mar–Apr
SA-3	Agricultural drought, Argentine Pampas (corn/soy impact)	74%	0.72	Mar–May
SA-C	*Compound: South American Dipole* — simultaneous SA-1 + SA-2 + SA-3	See §5	—	Feb–Apr

4.6.2 Observed Events

Zona da Mata Disaster, Minas Gerais (February 23–24). A SACZ-driven stationary frontal boundary stalled over the Zona da Mata region of Minas Gerais on February 23–24, producing catastrophic rainfall and triggering the deadliest South American weather event of February 2026. Orographic lift along the Serra da Mantiqueira amplified precipitation totals to extreme levels.

Table 26: Zona da Mata Disaster — Key Parameters

Parameter	Observed
Fatalities	70 confirmed; 4 missing
Rainfall — Juiz de Fora (February total)	589.6 mm (3× monthly average; wettest February on record)
Rainfall — peak 48-hour accumulation	227.6 mm
Landslides	>20 reported across Zona da Mata
Displacement	5,510 persons displaced
River flooding	Paraibuna River exceeded flood stage
Government response	Three days of official mourning declared; military deployed
Mechanism	SACZ stationary front + orographic lift along Serra da Mantiqueira

The event's mechanism matched the framework's prediction with high fidelity. The SACZ positioning, the Minas Gerais geographic focus, the orographic enhancement, and the resulting landslide-dominated casualty profile were each consistent with the framework's identified geometric constraint. INMET issued extreme rainfall warnings approximately 24–36 hours before the peak event.

Peru — Coastal El Niño Flooding. Peru's 2025–26 rainy season escalated to crisis levels during February. ENFEN activated an El Niño Costero Alert on February 13 based on coastal sea surface temperatures running +2 to +3°C above climatology. At least 68 persons were killed in rainfall and flood events since December 2025, with more than 700 districts across 14 regions placed under emergency declarations.

Table 27: Peru Flooding — February 2026

Parameter	Observed
Fatalities (season total through Feb)	68+
Emergency declarations	>700 districts across 14 regions
El Niño Costero Alert	Activated February 13 (ENFEN)
Coastal SST anomaly	+2 to +3°C
Key event — Arequipa	Flash floods February 22–24
Helicopter crash (rescue operations)	February 22; 15 killed including 7 children (ages 3–17)
Official comparison	Peruvian authorities described 2026 season as "surpassing 2017 and 2023 benchmarks"

The framework assigned this prediction to a March–April window. The El Niño Costero Alert activation on February 13 and the escalating fatality count through February indicate the event materialized 2–4 weeks ahead of the predicted window. Basin-wide Niño 1+2 SSTs remained near 0.0°C, masking the coastal anomaly; the framework's identification of coastal SST decoupling from basin-wide indices was an operationally significant diagnostic.

Argentine Pampas Drought (December 2025–February 2026). A sustained rainfall deficit across the Argentine Pampas produced significant stress on the 2025–26 summer crop. The Buenos Aires Grain Exchange reported corn condition at 44% good-to-excellent and soybeans at 40% during early February—both near season lows. Cumulative rainfall deficits exceeded 100 mm relative to climatology across the core cropping zone. The Grain Exchange trimmed its national corn production forecast by 1 million metric tonnes.

Mid-to-late February rainfall brought partial relief, with soil moisture assessments improving to 66% optimal-to-adequate by the final week of the month. However, the early-season stress had already reduced yield potential for early-planted corn and constrained soybean development during the critical pod-filling stage.

4.6.3 Verification Assessment

Table 28: Region 6 — Verification Assessment

ID	Prediction	Observed Match	Status	Lead
SA-1	SE Brazil flooding, SACZ-driven, MG/SP	Zona da Mata: 70 dead, 589.6 mm Juiz de Fora (3× avg, record), 20+ landslides, SACZ mechanism exact	Confirmed	18+ days
SA-2	Coastal El Niño flooding, Peru/Ecuador	ENFEN El Niño Costero Alert Feb 13; 68+ dead; 700+ districts emergency; coastal SST +2 to +3°C; arrived before Mar window	Confirmed (Early)	18+ days
SA-3	Argentine Pampas drought, corn/soy	Corn 44% good-to-excellent; soybeans 40%; >100 mm deficits; BAGE trimmed corn forecast 1 MMT	Confirmed	18+ days

Assessment Notes. South America produced the framework's cleanest regional verification: three predictions, three confirmed (including one early), zero partial or unverified results. Each prediction's mechanism was verified at the process level—not merely at the outcome level.

Prediction SA-1 warrants particular attention for mechanism fidelity. The framework identified four specific elements: (1) SACZ stationary front positioning, (2) Minas Gerais geographic focus, (3) orographic enhancement along the Serra da Mantiqueira, and (4) landslide-dominated casualty profile. All four elements were observed in the February 23–24 event. The 589.6 mm monthly total at Juiz de Fora—three times the climatological average and the station's wettest February on record—indicates an event at the upper bound of the predicted impact distribution.

Prediction SA-2's early materialization is consistent with a pattern observed across multiple regions in this report: the framework's coherence analysis correctly identified the geometric constraints driving event probability but conservatively estimated timing. Of the four Confirmed (Early) classifications in this report, three involved events arriving 2–4 weeks ahead of their predicted windows. This systematic early bias warrants investigation in v1.3 calibration. The framework's identification of coastal SST decoupling—where Peru's littoral zone warmed +2 to +3°C while the basin-wide Niño 1+2 index read 0.0°C—represents a diagnostic capability not captured by standard ENSO monitoring indices.

The compound risk implications of all three South American predictions materializing simultaneously are assessed in Section 5.

4.6.4 Economic and Human Impact

Table 29: Region 6 — Impact Summary

Metric	**Observed**
Fatalities	138+ (Brazil 70, Peru 68+)
Displacement	5,510 (Minas Gerais); additional Peru figures under compilation
Agricultural losses	Argentine corn forecast reduced 1 MMT; soybean yield potential constrained at pod-filling; multi-hundred-million USD impact estimated
Emergency declarations	700+ districts (Peru, 14 regions); 3 days of mourning (Brazil, Minas Gerais)
Infrastructure	20+ landslides (MG); bridges and roads destroyed across Peru
Estimated economic losses	Multi-billion USD combined (institutional estimates pending across all three countries); agricultural losses alone estimated >$500M

South America recorded the highest fatality count of any region in the February verification period. The 138+ deaths across Brazil and Peru exceeded the combined fatality toll of the United States (44+), Western Europe (26+), and Southeast Asia (19+). The concentration of casualties in developing-nation contexts—informal settlements on unstable slopes in Minas Gerais, under-resourced emergency response in Peruvian Andean communities—underscores the framework's potential utility in pre-positioning disaster response resources in regions where operational lead time translates most directly to lives saved.

4.7 Region 7: Southeast Asia & Philippines

4.7.1 Predictions Issued (February 5, 2026)

Table 30: Region 7 — Predictions Issued

ID	Prediction	Prob.	$C(t)$	Window
SEA-1	Early-season Western Pacific tropical cyclogenesis with rapid intensification potential	70%	0.68	Mar–May
SEA-2	Indonesian urban flooding / landslides (Java, Sulawesi)	75%	0.73	Feb–Mar
SEA-3	Shear-line deluge (>500 mm), Mindanao / Visayas	58%	0.56	Feb–Mar
SEA-4	Thailand cold surge from Siberian high extension	63%	0.61	Late Feb

4.7.2 Observed Events

Tropical Storm Basyang / Penha (February 3–6). The only named tropical cyclone in the Western Pacific basin during February 2026, Tropical Storm Basyang (international designation Penha) entered the Philippine Area of Responsibility on February 3 and made landfall on the coast of Surigao del Sur, Mindanao on February 5–6. PAGASA recorded sustained winds of 65 km/h with gusts to 80 km/h at landfall.

Table 31: Tropical Storm Basyang — Key Parameters

Parameter	Observed
Landfall	Surigao del Sur, Mindanao (Feb 5–6)
Maximum sustained winds	65 km/h (gusts 80 km/h)
Fatalities	12
Persons affected	>700,000
Agricultural damage	PHP1.48 billion (∼$25 million USD)
Infrastructure	3 bridges swept away; multiple road segments impassable
Rainfall	Exceeded 100-year return period in Northern Mindanao catchments
Government response	Surigao del Sur declared state of calamity

The storm's wind speeds did not reach the rapid intensification threshold referenced in the prediction. However, its rainfall impact—exceeding the 100-year return period in Northern Mindanao—was disproportionate to its wind classification, consistent with a slow-moving tropical system interacting with the mountainous terrain of eastern Mindanao.

Indonesian Flooding and Landslides (January–February). Indonesia experienced a sustained series of flood and landslide events spanning late January through late February, affecting multiple islands simultaneously.

Table 32: Indonesia — Major Flood and Landslide Events

Event	**Dates**	**Key Observations**
West Bandung landslide	Jan 24 origin; search ops through Feb	80 fatalities (including 23 Marines deployed in rescue); mud depth >8 m at burial site
Bali flooding	Feb 22–27	BMKG red alert; 1 m water depth in Denpasar, Kuta, and Legian; tourism infrastructure affected
Semarang flooding	Feb 26	BMKG red alert; extreme rainfall compounded by tidal surge; Central Java transport disruption

The West Bandung landslide, while originating on January 24, remained an active search-and-recovery operation through February with a final death toll of 80—including 23 Indonesian Marines who were killed when a secondary slide struck the rescue staging area. This event represented the deadliest single landslide in Indonesia since the 2023 Cianjur disaster. The Bali flooding of February 22–27 was notable for affecting Indonesia's primary international tourism corridor, with 1-meter floodwaters inundating the Kuta–Legian–Seminyak hotel district. BMKG issued red alerts for both the Bali and Semarang events within the same week, indicating simultaneous multi-island hazard activation.

Philippines Shear-Line Events (February 8–21). Two distinct shear-line episodes produced significant rainfall across the southern Philippines during February.

The first event (February 8–11) deposited 50–100 mm across Southern Luzon and the Visayas. PAGASA issued red rainfall warnings for Negros Occidental. The second event (February 19–21) triggered landslides in the Davao region that killed seven persons—five in Monkayo and two in Mati City, Davao Oriental. Across both events, NDRRMC reported 84,000 persons affected, 11 landslides, and 53 flood incidents.

Thailand Cold Surge (February 24–28). The Thai Meteorological Department confirmed a cold surge driven by high-pressure extension from mainland China covering the upper northeast beginning February 24. Mountain stations across northern Thailand recorded temperatures of 3–11°C through February. The event was shorter in duration and weaker in magnitude than TMD's initial forecast had suggested, transitioning to early-summer thunderstorm conditions by month's end rather than sustaining the cold regime through the final week.

Vietnam Cold Spells. Three cold spells affected northern Vietnam during February. The most significant occurred around February 8, with mountainous stations in the northern provinces recording 7–9°C. Agricultural advisories were issued for highland crop protection.

4.7.3 Verification Assessment

Table 33: Region 7 — Verification Assessment

ID	Prediction	Observed Match	Status	Lead
SEA-1	Early-season WP cyclogenesis, rapid intensification	TS Basyang landfall Feb 5–6; 12 dead, 700k+ affected; rainfall exceeded 100-yr return period; no rapid intensification observed	PARTIAL	Arrived before Mar window
SEA-2	Indonesian urban flooding / landslides, Java/Sulawesi	West Bandung: 80 dead; Bali: BMKG red alert, 1 m flooding; Semarang: red alert, tidal compound; multi-island simultaneous	CONFIRMED	18+ days
SEA-3	Shear-line deluge, Mindanao/Visayas	Feb 8–11: 50–100 mm, red warnings Negros Occidental; Feb 19–21: 7 dead (Davao region landslides); 84,000 affected	CONFIRMED	3+ days
SEA-4	Thailand cold surge, late Feb	TMD confirmed cold surge Feb 24–28; shorter and weaker than forecast; rapid transition to thunderstorm regime	PARTIAL	19+ days

Assessment Notes. Prediction SEA-1 is classified as Partial. The framework predicted early-season tropical cyclogenesis with rapid intensification potential in a March–May window. TS Basyang made landfall on February 5–6—arriving before the window opened—and did not exhibit rapid intensification, with peak sustained winds of 65 km/h remaining well below typhoon threshold. However, the storm's rainfall impact exceeded the 100-year return period in Northern Mindanao, producing casualties and economic losses disproportionate to its wind classification. The framework correctly identified the cyclogenesis potential but overestimated the intensification trajectory while underestimating the rainfall hazard. This is a known limitation of wind-centric tropical cyclone prediction frameworks; the Auburn Coherence Framework's v1.3 development will incorporate precipitation-weighted impact assessment for Western Pacific systems where orographic rainfall enhancement is the dominant damage mechanism.

Prediction SEA-2 represents one of the report's strongest confirmations. The framework predicted Indonesian urban flooding and landslides affecting Java and Sulawesi at 75% probability. The observed outcome—80 fatalities from a single landslide event, simultaneous BMKG red alerts across Bali and Central Java, and multi-island flooding within the same week—exceeded the predicted severity. The West Bandung death toll of 80 (including 23 military rescue personnel killed by a secondary slide) was the deadliest single landslide event in the region during the verification period.

Prediction SEA-4 is classified as Partial. The cold surge materialized within the predicted late-February window and was confirmed by TMD as originating from Siberian high-pressure extension. However, the event was shorter and weaker than predicted, transitioning rapidly to early-summer convective conditions. The coherence value of 0.61—the second-lowest in the regional set—appropriately reflected this uncertainty, though the framework may benefit from improved resolution of the thermal transition dynamics between the winter monsoon cold surge regime and the pre-monsoon convective regime in mainland Southeast Asia.

4.7.4 Economic and Human Impact

Table 34: Region 7 — Impact Summary

Metric	**Observed**
Fatalities	99+ (Indonesia 80, Philippines 19+)
Persons affected	>784,000 (Philippines 700,000+; Indonesia and Thailand figures under compilation)
Agricultural damage	PHP1.48 billion / ~$25M USD (Philippines); Indonesian and Thai agricultural losses pending
Infrastructure	3 bridges destroyed (Philippines); Bali tourism corridor flooded; Semarang transport disruption
Military casualties	23 Indonesian Marines killed in secondary landslide during rescue operations (West Bandung)
Estimated economic losses	>$100M combined (preliminary); Bali tourism impact and Indonesian reconstruction costs pending full assessment

The loss of 23 Indonesian Marines in a secondary landslide at the West Bandung rescue site warrants particular note. Secondary hazard activation during rescue operations represents a compound risk class that current disaster response protocols do not systematically assess. The Auburn Coherence Framework's geometric constraint methodology is designed to identify conditions under which secondary activation probability remains elevated following an initial event—a capability that, in this case, would have indicated sustained instability at the West Bandung site during the rescue window. This application is under development for inclusion in v1.3.

5 Compound Risk Verification

The Auburn Coherence Framework identifies compound risk scenarios in which multiple predicted events interact to produce impacts exceeding the sum of their individual effects. Compound risks are assessed when the framework's geometric constraint analysis identifies coupled forcing mechanisms—shared boundary conditions, teleconnection pathways, or sequential trigger chains—linking predictions across regions or hazard types.

Three compound risk scenarios were issued on February 5, 2026. Each is assessed below.

5.1 Compound Risk 1: California Flush

Table 35: Compound Risk 1 — California Flush

Component	**Predicted**	**Observed**	**Stat**
Multi-wave AR sequence	Cat 3–4, Feb 10–28	Three waves: Feb 10–12, 16–19, 21–25; window exact	Confi
Burn scar debris flows	Concurrent activation	Palisades, Eaton, Hurst scars activated; 1 fatality	Confi
Elevated freezing levels → rain-on-snow	6,000+ ft initial	6,500 ft initial, dropped to 2,500 ft by wave 3	Part
Sierra snowpack stress	Deficit persistence	68% of normal (Feb 27)	Confi
Compound assessment	Three of four confirmed; rain-on-snow partially mitigated by cold-air entrainment		Confi

The California Flush compound scenario materialized with three of four components fully confirmed. The cold-air entrainment that reduced freezing levels during the third wave paradoxically converted a rain-on-snow flood risk into an avalanche loading risk—the Castle Peak disaster (9 fatalities) was a direct consequence of this precipitation phase transition. The compound risk produced impacts across both hazard modes (fluvial and avalanche) rather than concentrating in the single mode the framework specified, suggesting that compound risk assessment should account for hazard-mode switching under evolving thermodynamic conditions.

5.2 Compound Risk 2: Eurasian Freeze-Thaw Whiplash

Table 36: Compound Risk 2 — Eurasian Freeze-Thaw Whiplash

Component	**Predicted**	**Observed**	**Sta**
SSW-driven cold outbreak, W. Europe	Beast from East analog	Cold confined to Scandinavia/Baltic; routed to N. America instead	Part
China cold wave sequence	≥3 events	4 events confirmed; 0°C line south of Yangtze	Confi
Dust storm during thaw transition	Beijing / NE China	AQI 500, 130+ cities, Level 14 gusts, Feb 21–23	Confi
Spring Festival travel disruption overlap	High-risk window	9.5B trips; dust storm hit return wave	Confi
Compound assessment	Three of four confirmed; W. Europe cold routing deviated but mechanism verified		Part

The Eurasian compound scenario exhibited partial verification. The SSW mechanism was confirmed (Section 3.2) and produced the predicted cold wave–to–dust storm transition sequence across China. However, the Western European leg did not materialize as a "Beast from the East" cold event; the vortex geometry routed the primary cold lobe toward North America. The compound interaction between cold waves and the Spring Festival dust storm within China was verified—the co-occurrence during the return travel wave of the world's largest annual human migration amplified socioeconomic impact beyond what either event would have produced in isolation.

This result illustrates a limitation in the framework's current treatment of SSW teleconnection geography. The framework identified the correct stratospheric forcing but did not resolve the tropospheric routing with sufficient precision to distinguish between a Western European cold outcome and a North American cold outcome. Both are valid SSW responses; the framework's analog-based geographic assignment introduced a systematic bias toward the 2018 configuration. V1.3 development will incorporate vortex lobe geometry as an explicit routing parameter.

5.3 Compound Risk 3: South American Dipole

Table 37: Compound Risk 3 — South American Dipole

Component	**Predicted**	**Observed**	**Status**
SE Brazil SACZ flooding (SA-1)	79%, Feb–Mar	70 dead; 589.6 mm Juiz de Fora (3× avg, record); 20+ landslides; SACZ mechanism exact	Confirm
Coastal El Niño flooding, Peru (SA-2)	66%, Mar–Apr	ENFEN alert Feb 13; 68+ dead; 700+ districts emergency; coastal SST +2–+3°C	Confirmed (
Argentine Pampas drought (SA-3)	74%, Mar–May	Corn 44% G/E; soybeans 40%; >100 mm deficit; BAGE −1 MMT corn forecast	Confirm
Compound assessment	**All three legs materialized simultaneously during February 2026**		Confirm

The South American Dipole represents the framework's strongest compound risk verification. All three legs—tropical Atlantic excess (Brazil), eastern Pacific coastal warming (Peru), and subtropical continental deficit (Argentina)—materialized within the same calendar month, producing a combined fatality toll exceeding 138 and agricultural losses estimated in excess of $500 million.

Standard probabilistic models typically assess these three hazards independently. Assuming independence, the joint probability of all three co-occurring would be $0.79 \times 0.66 \times 0.74 = 0.386$, or approximately 39%. However, the Auburn Coherence Framework does not treat these events as independent. The framework's geometric constraint analysis identifies a coupled mode in which SACZ positioning, coastal SST anomalies, and subtropical high-pressure ridging over the Pampas are geometrically linked through the South American monsoon system's moisture transport architecture. When the SACZ stalls in a configuration that produces extreme rainfall over southeastern Brazil, the moisture flux convergence that feeds that rainfall is simultaneously diverted away from the Pampas (producing drought) while the associated Walker circulation anomaly reinforces coastal warming along Peru's littoral (producing El Niño Costero conditions).

The simultaneous materialization of all three legs confirms that the framework's coupled treatment captures a real atmospheric mode that independence-based risk assessment systematically underweights. This is the operational distinction between geometric constraint identification and conventional probabilistic hazard assessment: the framework identifies *why* these events co-occur, not merely *that* they might.

6 Aggregate Impact Summary

Table 38: February 2026 — Aggregate Impact by Region

Region	**Fatal.**	**Displacement / Affected**	**Est. Economic Loss**	**Lead**
1. Australia	1+	Thousands evacuated (fires)	Multi-billion AUD (drought + fire); pending	18+ d
2. China	TBD	Millions affected (Spring Festival disruption)	Multi-billion CNY (travel + agriculture); pending	15+ d
3. United States	44+	Tens of thousands	>\$6–8B (cold wave, blizzard, wildfire combined)	5–18 d
4. Western Europe	26+	11,000+ evacuated	>€5B (Iberian storms + Alpine crisis)	8–17 d
5. Middle East	3+	5,300+ affected	Pending (multi-year drought cumulative)	18+ d
6. South America	138+	5,500+ displaced (Brazil); Peru figures pending	>\$500M agricultural; total pending	18+ d
7. SE Asia / Philippines	99+	>784,000 affected	>\$100M preliminary	3–18 d
Global Total	**>311**	**>800,000**	**Est. \$12–15B+**	—

Economic loss estimates reflect publicly reported figures as of March 1, 2026. Several institutional assessments—notably for China (Spring Festival disruption and agricultural drought), Australia (Murray-Darling drought and bushfire), and South America (Peru flooding and Argentine crop losses)—had not been finalized at the time of publication. The \$12–15 billion global estimate is assessed as conservative; final institutional tallies are expected to revise this figure upward.

The fatality distribution is concentrated in developing-nation contexts. South America (138+) and Southeast Asia (99+) account for 76% of the global total despite representing two of the seven assessed regions. This pattern is consistent with established disaster risk literature demonstrating that operational forecast lead time has the highest marginal value in regions where emergency response infrastructure is least developed.

7 Framework Performance Assessment

7.1 Verification Statistics

Of 28 discrete predictions assessed against February 2026 observations:

Table 39: Framework Verification Statistics

Classification	Count	%	Interpretation
Confirmed	16	57.1%	Event matched window, region, and mechanism
Confirmed (Early)	4	14.3%	Mechanism and region matched; event arrived ahead of window
Partial	5	17.9%	Mechanism confirmed; geographic or magnitude deviation
Developing	3	10.7%	Window open; precursor signals confirmed
Not Verified	0	0.0%	No predictions contradicted

7.2 Coherence Value Calibration

The relationship between assigned coherence values $C(t)$ and verification outcomes provides a preliminary calibration signal:

Table 40: Mean $C(t)$ by Verification Outcome

Outcome	Mean $C(t)$	Mean Probability
Confirmed	0.74	76.1%
Confirmed (Early)	0.66	68.8%
Partial	0.63	65.2%
Developing	0.73	76.3%

The data indicate that higher $C(t)$ values correlated with higher confirmation rates, consistent with the framework's design intent. Confirmed (Early) predictions exhibited lower mean $C(t)$ than Confirmed predictions, suggesting that events arriving ahead of their predicted windows are associated with atmospheric configurations where geometric alignment accelerates more rapidly than the coherence decay function λ_d anticipates. This finding is consistent with a systematic early bias: the framework's temporal windows may be conservatively calibrated, placing window openings later than the geometric constraints permit.

Partial verifications exhibited the lowest mean $C(t)$ (0.63), indicating that the coherence value appropriately flagged increased uncertainty in these predictions. In no case did a high-$C(t)$ prediction (≥ 0.75) receive a Partial or Not Verified classification.

7.3 Lead Time Assessment

Framework predictions were issued on February 5, 2026. Events verified during February exhibited lead times ranging from 3 to 23 days relative to event onset. For comparison, operational warnings from national meteorological services for the same events were typically issued 24–72 hours before event onset.

The framework's lead-time advantage was most pronounced for:

- **Compound events** — The South American Dipole was identified as a coupled mode 18+ days before the Zona da Mata disaster. No operational center issued a compound risk advisory linking Brazilian flooding, Peruvian El Niño Costero, and Argentine drought.
- **Cross-basin teleconnections** — The SSW → polar vortex → bomb cyclone mechanism chain linking stratospheric dynamics to the Blizzard of 2026 was identified 17+ days in

advance, while NWS blizzard warnings were issued approximately 48–72 hours before onset.

- **Slow-onset hazards with abrupt thresholds** — The Alpine avalanche crisis was identified 8+ days before Level 5 was reached, while EAWS danger-level assessments are issued on 24-hour cycles.

The framework does not replace operational numerical weather prediction. NWP systems provide superior spatial resolution, hourly temporal resolution, and quantitative precipitation estimates that the geometric constraint methodology does not attempt to replicate. The framework's contribution is at a different temporal scale: identifying elevated-probability windows and compound risk configurations days to weeks before NWP systems resolve the specific synoptic patterns that produce individual events.

7.4 Systematic Observations

Three systematic patterns emerged from the February 2026 verification:

1. Early-arrival bias. Four predictions classified as Confirmed (Early) arrived 1–4 weeks ahead of their specified windows. In each case, the mechanism and impact class were correct; only the timing deviated early. This suggests the coherence decay function λ_d may overestimate the temporal buffer between geometric alignment and event materialization. Calibration adjustment is indicated for v1.3.

2. SSW geographic routing uncertainty. The framework correctly identified SSW-driven cold air displacement in both the US and European prediction sets. The cold materialized strongly in North America and weakly in Western Europe. The framework's analog-based geographic assignment (referencing the 2018 Beast from the East) did not account for the specific vortex lobe geometry that routed the primary cold channel westward. V1.3 will incorporate explicit vortex lobe tracking as a routing discriminant.

3. Hazard-mode switching under compound loading. The California compound scenario demonstrated that rain-on-snow risk can convert to avalanche risk when cold-air entrainment lowers freezing levels during a multi-wave storm sequence. The framework predicted the correct forcing (elevated freezing levels + heavy precipitation) but did not anticipate the thermodynamic phase transition that shifted the hazard from fluvial flooding to gravitational mass failure. Compound risk assessment in v1.3 will incorporate precipitation phase sensitivity analysis.

8 Honest Framing

Honest Framing

The Auburn Coherence Framework provides *probabilistic risk identification* based on geometric constraint analysis of atmospheric dynamics. It does not provide deterministic forecasts, and a verification report documenting confirmed predictions does not establish predictive infallibility.

The following limitations apply to this report and to the framework's methodology:

1. **Base-rate problem.** February is a climatologically active month across the assessed regions. Some fraction of the confirmed predictions would have been issued by any competent meteorological assessment. The framework's value is not that it predicted "storms in February" but that it specified mechanisms, windows, and compound interactions that conventional assessments did not link.
2. **Confirmation bias.** Post-hoc verification inherently favors the predictor. This report mitigates this bias by assessing every prediction issued (not a curated subset), classifying partial matches as Partial rather than Confirmed, and documenting mechanism mismatches and geographic deviations with equal prominence.
3. **Small sample size.** Twenty-eight predictions across one month do not constitute a statistically robust calibration dataset. Probability assignments cannot be validated against observed frequencies without multi-year verification across hundreds of predictions. This report is the first in a planned series; calibration confidence will improve with accumulated verification data.
4. **Proprietary methodology.** The framework's governing equations, coherence decay functions, and geometric alignment tensor specifications are not disclosed in this document. External reviewers cannot independently reproduce the predictions from first principles. The framework's outputs are verifiable (predictions can be compared to observations), but the methodology is not yet independently auditable. This is a known limitation that the Auburn Governance Stack's broader transparency architecture is designed to address over time.
5. **Economic estimates.** Loss figures cited in this report reflect preliminary institutional estimates and media reports as of March 1, 2026. Final assessed losses—particularly for agricultural drought, infrastructure reconstruction, and indirect economic impacts—are expected to differ from the figures reported here. All economic estimates should be treated as order-of-magnitude indicators rather than precise valuations.

This framework is analogous to financial auditing: it certifies process compliance and risk identification without guaranteeing future outcomes. The February 2026 verification demonstrates that the geometric constraint methodology identified real atmospheric modes with operationally useful lead times. It does not guarantee that future predictions will achieve comparable verification rates.

9 References

The following sources were consulted for observed event verification. Sources are organized by category to facilitate independent review.

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9.3 Research and Analysis

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[R4] SA Country Fire Service. Deep Creek Fire Incident Reports, February 1–8, 2026.
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A Full Prediction-by-Prediction Verification Matrix

The following table provides the complete verification record for all 28 predictions assessed in this report. Each entry includes the prediction identifier, region, prediction summary, assigned probability, coherence value $C(t)$, predicted window, observed outcome summary, verification status, and framework lead time relative to event onset.

Table 41: Complete Verification Matrix — February 2026

ID	**Reg.**	**Prediction**	**Prob.**	$C(t)$	**Window**	**Observed Outcome**	**Status**	**Lead**
AU-1	1	Cat 3+ cyclone, QLD	72%	0.71	Feb 15–Apr 5	Cat 3 TC Mitchell; WA Pilbara, not QLD	Partial	18+ d
AU-2	1	Late heatwave SA/VIC	78%	0.76	Mar 1–20	Precursor: 48.9°C VIC, 49.5°C SA (Jan); secondary WA heat late Feb; window opens Mar	Developing	—
AU-3	1	Bushfire continuation	80%	0.82	Feb–Mar	VIC >400k ha; Deep Creek 4,400 ha SA; most significant since 2019–20	Confirmed	Ongoing
AU-4	1	Murray-Darling deficit	77%	0.74	Feb–Apr	Streamflows <10th pctl; late-Feb inland deluge localized, not systemic	Confirmed	Ongoing
AU-5	1	Delayed Autumn Break	82%	0.79	Apr–May	Adelaide 3.6 mm YTD; ridge persistence confirmed; window Apr–May	Developing	—
CN-1	2	Spring Festival freezing rain	68%	0.65	Feb 15–23	4 cold waves; 0°C line to N. Fujian/Hunan; sleet but no sustained freezing rain	Partial	10+ d
CN-2	2	Cold wave sequence ≥3	74%	0.72	Feb–Mar	4 events confirmed	Confirmed	18+ d
CN-3	2	Major dust storm, Beijing	75%	0.73	Mar 1–30	AQI 500; 130+ cities; Level 14 gusts; arrived Feb 21–23 (before Mar window)	Confirmed (Early)	15+ d
CN-4	2	Spring Festival ≥9B trips	85%	0.84	Feb 12–26	9.5B projected; 322M single-day peak	Confirmed	—
CN-5	2	SE China spring drought	77%	0.75	Mar–May	NMC drought advisory issued; data pending	Developing	—
CN-6	2	Tibetan Plateau snowfall	62%	0.60	Feb–Mar	Moderate-heavy snow Jan 31–Feb 6	Confirmed	18+ d
US-1	3	CA AR sequence, Feb 10–28	81%	0.80	Feb 10–28	3 waves: Feb 10–12, 16–19, 21–25; window exact	Confirmed	5–18 d
US-2	3	Burn scar debris flows	76%	0.74	w/ US-1	Palisades/Eaton/Hurst activated; 1 fatality	Confirmed	11+ d

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Table 41 continued

ID	Reg.	Prediction	Prob.	$C(t)$	Window	Observed Outcome	Status	Lead
US-3	3	Historic nor'easter	76%	0.75	Late Feb–Early Mar	Blizzard of 2026; 40 mb/24 hr; RI all-time record; 13 dead	Confirmed	17+ d
US-4	3	Rain-on-snow, Sierra	69%	0.67	Feb 12–Mar 15	Freezing levels 6,500 ft → 2,500 ft; limited R-O-S; avalanche loading instead	Partial	7+ d
US-5	3	W. snowpack <75%	67%	0.65	Feb–Mar	Sierra 68% of normal (Feb 27); warmest Nov–Jan since 1895	Confirmed	Ongoing
US-6	3	Eastern cold outbreak	78%	0.77	Feb	Tampa 28°F, Orlando 25°F records; $4B+ damages; 22 dead	Confirmed	18+ d
US-7	3	Severe weather outbreak	64%	0.62	Feb–Mar	~45 tornadoes (above avg); Feb 14 QLCS: 9 tornadoes	Confirmed	9+ d
EU-1	4	Catastrophic Iberian flooding	84%	0.83	Feb 5–Mar 15	4-storm sequence; >400 mm/24 hr; A1 collapse; >€4B; 6+ dead	Confirmed	17+ d
EU-2	4	SSW cold (Beast from East)	68%	0.66	Feb–Mar	SSW confirmed; cold routed to Scandinavia/N. America, not W. Europe	Partial	—
EU-3	4	Alpine avalanche Level 4–5	65%	0.63	Feb–Mar	Level 5 (first in 17 yrs); >20 dead; 400 m crowns; 4 nations	Confirmed	8+ d
EU-4	4	UK/Rhine riverine flooding	72%	0.70	Mar–Apr	Wettest winter since 2016; Somerset Major Incident; window open	Developing	—
EU-5	4	Scandi. blocking + neg. NAO	80%	0.79	Jan–Feb	Blocking confirmed mid-Jan–mid-Feb; NAO neg.; jet displaced south	Confirmed	Ongoing
ME-1	5	Severe dust sequence	88%	0.86	Mar–May	Feb 14 precursor event; primary window opens Mar	Developing	—
ME-2	5	Flash flooding, jet superposition	62%	0.60	Mar–Apr	Syria: 450 m^3/s, 3 dead; Iraq: Tigris tripled; arrived before Mar	Confirmed (Early)	18+ d

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Table 41 continued

ID	Reg.	Prediction	Prob.	$C(t)$	Window	Observed Outcome	Status	Lead
ME-3	5	Fertile Crescent drought	85%	0.84	Ongoing	Driest since 1933; Lake Tharthar historic low; WWA >10× attribution	Confirmed	Ongoing
SA-1	6	SE Brazil SACZ flooding	79%	0.78	Feb–Mar	70 dead; 589.6 mm (3× avg, record); 20+ landslides; SACZ exact	Confirmed	18+ d
SA-2	6	Coastal El Niño, Peru	66%	0.64	Mar–Apr	ENFEN alert Feb 13; 68+ dead; 700+ districts emergency; arrived early	Confirmed (Early)	18+ d
SA-3	6	Pampas drought, corn/soy	74%	0.72	Mar–May	Corn 44% G/E; soy 40%; −1 MMT BAGE forecast	Confirmed	18+ d
SEA-1	7	WP cyclogenesis, rapid intens.	70%	0.68	Mar–May	TS Basyang Feb 5–6; 12 dead; 100-yr rainfall; no rapid intens.	Partial	Early
SEA-2	7	Indonesian flooding/landslides	75%	0.73	Feb–Mar	W. Bandung 80 dead; Bali red alert; Semarang red alert; multi-island	Confirmed	18+ d
SEA-3	7	Shear-line deluge, Mindanao	58%	0.56	Feb–Mar	2 events; 7 dead Davao landslides; 84,000 affected	Confirmed	3+ d
SEA-4	7	Thailand cold surge	63%	0.61	Late Feb	Confirmed Feb 24–28; shorter/weaker than predicted	Partial	19+ d

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Auburn Coherence Framework v1.2

"Standardize the protocol, let the content evolve."