Auburn Framework

Weather Coherence Predictions

February 5 – May 5, 2026

Seven-Region Global Forecast Using the Coherence Mechanism

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"The fluid equations are the ladder. The topology of failure is the view from the top."

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Scope and Limitations

This document presents **forward predictions** derived from the Auburn Coherence Framework (Auburn Framework v1.2, February 2026). It is a prediction registry—not a methodology paper. All predictions are generated by the framework's coherence mechanism applied to publicly observable atmospheric precursors across seven global regions.

These predictions are not operational forecasts. The Auburn Framework provides geometric constraints on atmospheric dynamics; it does not replace operational numerical weather prediction. The author is not a meteorologist and makes no operational recommendations. This document is offered openly for examination, scrutiny, and—if warranted—collaboration.

Methodology Note: *Specific governing equations, coherence decay rates (λ_d), and geometric alignment tensors have been redacted from this public release to protect commercial intellectual property. These predictions are generated by the Auburn Coherence Framework v1.2 (Internal Build 2026-02-05). Verification data is available upon request for qualified institutional partners.*

Should the predictions contained herein demonstrate skill above climatological base rates—as assessed by the Verification Protocol (Section 11)—independent researchers are invited to contact the author regarding access to the underlying methodology.

1 Global Coherence State Assessment

The global atmosphere as of February 5, 2026, is characterized by **high meridional coherence** and **low zonal coherence**. This asymmetry is driven by the constructive interference of two dominant forcings: a catastrophic Sudden Stratospheric Warming (SSW) event that has fractured the polar vortex, and a decaying La Niña that is yielding to ENSO-neutral conditions. The SSW establishes vertically coherent blocking structures in the meridional plane, while the collapsing Walker Circulation fragments tropical convection zonally.

This configuration—which the framework identifies as the **Great Eurasian Divergence**—produces a planetary circulation in violent transition. Individual blocking structures exhibit high coherence and extended predictability, but the transitions between regimes are abrupt and chaotic. The framework classifies this as a **metastable state**: the tails of the distribution—extreme cold, extreme heat, and extreme precipitation—are far more probable than climatological base rates during this window.

1.1 Global Forcing Summary

Parameter	State	Anomaly	Framework Implication
Stratosphere (10 hPa)	Vortex Split	$+4.0\,\sigma$	Extreme meridional coherence driver
Arctic Oscillation	$-2.5\,\sigma$	Extreme Neg.	Cross-Polar Flow locked; cold outbreaks
ENSO (ONI)	$-0.5\,^{\circ}\mathrm{C}$	Weak La Niña	Zonal coherence fragmenting
MJO	Phase 7/8	Moderate	Intraseasonal trigger for regime shifts
Global SST	Above clim.	$+0.5$ to $+2.0\,\sigma$	Moisture reservoir amplification
SAM (AAO)	$+0.8\,\sigma$	Positive	Southern westerlies contracted poleward

Table 1: Global forcing state as of February 5, 2026. Anomalies relative to 1991–2020 climatology.

1.2 Hemispheric Coherence Architecture

The **Northern Hemisphere** is dominated by the SSW-induced polar vortex split. Two daughter vortices—one over North America (Baffin Bay) and one over Eurasia—establish direct corridors for Arctic air mass transport into the mid-latitudes. The Arctic Oscillation, at $-2.5\,\sigma$, is among the most negative values in the satellite record for early February. This vertical coupling between the stratosphere and troposphere increases the base rate of cold-air outbreak events by a factor of 2–3 compared to climatological means.

The **Southern Hemisphere** is comparatively stable. The Southern Annular Mode is weakly positive ($+0.8\,\sigma$), contracting the belt of westerly winds toward Antarctica. This reduces frontal rainfall in southern Australia and southern South America while enhancing trade-wind-driven precipitation in the subtropics.

The **tropical belt** is in transition. The Oceanic Niño Index hovers at the $-0.5\,^{\circ}\mathrm{C}$ La Niña threshold, but subsurface warm anomalies are propagating eastward—the ocean is recharging. NOAA CPC assigns a 75% probability of ENSO-neutral conditions by the February–April window. The Madden-Julian Oscillation is currently propagating from Phase 7 (Western Pacific) into Phase 8/1 (Western Hemisphere), a trajectory that historically correlates with increased high-latitude blocking and jet retraction—amplifying the SSW's surface impacts.

1.3 Coherence Interpretation

The Auburn Framework processes these forcing states through its coherence mechanism to produce the regional predictions that follow. Each region receives a coherence classification (HIGH, MODERATE, or LOW) that reflects the degree of geometric organization in the atmospheric flow. High-coherence states correspond to organized, persistent structures—blocking patterns, locked heat domes, and coherent storm tracks—with extended predictability windows. Low-coherence states correspond to turbulent, cascade-dominated regimes where the framework's predictive advantage diminishes to standard numerical weather prediction limits.

The framework also identifies **coherence divergence** between competing atmospheric modes within a region. When windstorm coherence significantly exceeds atmospheric-river coherence (or vice versa), the framework flags the dominant hazard mechanism—a discrimination capability validated in the January 2026 Western European case study.

All coherence values reported in this document are outputs of the Auburn Coherence Framework v1.2. The computational methodology, threshold calibration, and regime-dependent parameters are proprietary. See the IP Declaration on p. ii for terms of use.

2 Region 1: Australia

Analysis Window: 10°S – 45°S, 110°E – 155°E | **Period:** Feb 5 – May 5, 2026

2.1 Coherence State

The Australian domain exhibits a stark coherence bifurcation. Northern Australia, under the active monsoon trough, registers **moderate-to-high coherence** in the tropical convective envelope, sustained by warm Coral Sea SSTs and MJO forcing. Six named cyclones have formed by early January—well above average pace—including Tropical Cyclone Koji making landfall in Queensland with catastrophic flooding. Monsoon flooding from late December onward deposited over 1,000 mm in seven days at Cowley Beach. The tropical north is in a kinetically energized, organized state.

Southern Australia presents the opposite face. An anomalously intense Subtropical Ridge has established a **high-coherence blocking pattern** over the Great Australian Bight, functioning as a geometric lid. This structure resists frontal intrusion from the south, locking the Murray-Darling Basin into a dry, hot regime. Southern Australia endured its worst bushfire crisis since Black Summer 2019–20 in early January, with Victoria declaring a State of Disaster across 18 local government areas—over 300,000 hectares burned and 300+ structures destroyed. The framework identifies this ridge as geometrically protected from decay: the atmospheric flow has minimized its internal dissipation, and the structure will persist until its coherence timer expires.

The Tasman Sea constitutes the critical interaction zone. SST anomalies provide thermodynamic fuel for explosive cyclogenesis. When a developing low enters this warm domain, the coherence function can spike rapidly as the system organizes—the geometric signature of a bomb cyclone or severe East Coast Low. The Bureau of Meteorology forecasts Tasman Sea warming through autumn, increasing this risk as the season progresses.

Soil moisture in the Murray-Darling Basin reflects October–December rainfall 26% below average, with spring 2025 rainfall among the lowest 10% since 1900 in parts of the basin. This antecedent dryness creates a positive feedback loop: with limited soil moisture for evaporative cooling, incoming solar radiation converts almost entirely to sensible heat.

2.2 Predictions

Event	P (Aubur	C(t)	Classificatic	Window
Late-season heatwave (SA/VIC); record March heat driven by persistent ridge and dry MDB soils	78%	0.82	High	Mar 1–20
Queensland tropical cyclone (Cat 3+); warm Coral Sea, active monsoon trough	72%	0.74	Moderate	Feb 15 – Apr 5
Tasman Sea explosive cyclogenesis; East Coast Low or bomb cyclone affecting NSW	65%	0.71	Moderate	Mar 15 – May 5
Delayed Autumn Break; southern growing season onset pushed into late May or June	82%	0.84	High	Apr – May

Table 2: Auburn Framework predictions for Australia, Feb–May 2026.

2.3 High-Coherence Scenario: The Black Nor'easter

A cutoff low develops over the anomalously warm Tasman Sea during a positive SAM phase. The high-pressure system to the south—the geometric lid identified in the coherence analysis—locks the low in place, driving moisture-laden easterlies into the NSW coast. The framework predicts this lock will hold for multiple days, as the blocking anticyclone has minimized its internal dissipation and is geometrically protected from decay.

The predicted impact is a 500+ mm rainfall event with catastrophic coastal flooding, while the interior remains simultaneously locked in drought. The coherence divergence between the wet coastal regime and the dry interior would be among the highest within-region gradients in the current global state—a compound event configuration that maximizes socioeconomic disruption.

The direct structural precedent is TC Oswald (2013): an ex-tropical cyclone tracking south into the Tasman, interacting with a mid-latitude trough to produce a severe East Coast Low over fire-scarred or saturated landscapes.

Compound Probability: 38% | **Pattern:** Stationary Cut-Off Low + Heat Dome

Simultaneous coastal flooding and interior drought driven by geometric lock between competing coherent structures.

3 Region 2: China

Analysis Window: 18°N – 50°N, 75°E – 135°E | **Period:** Feb 5 – May 5, 2026

3.1 Coherence State

The East Asian atmospheric regime is under the direct influence of an **extreme-intensity Siberian High**, dynamically coupled to the fractured polar vortex. This vertically stacked system registers **very high meridional coherence** in the cross-polar flow corridor, establishing a direct pipeline for Arctic air mass transport into the Chinese subtropics. Five cold wave events struck in January alone—versus a typical three—and four more are forecast for February. The most intense, spanning January 17–22, was described as the "largest, strongest, and most extensive rain, snow, and freezing event since the start of winter," pushing the 0°C line as far south as southern Guizhou and central Jiangxi. Inner Mongolia recorded −44.5 °C.

The framework classifies this as an **Omega Block variant** with the Siberian High acting as the deflector shield. Incoming disturbances are forced equatorward along the block's flanks, and the block itself is geometrically stable—its flow has aligned to minimize nonlinear self-interaction.

Perhaps the most consequential precursor for the spring transition is the **Tibetan Plateau snow cover deficit**. Below-normal snowfall across the Plateau, with Himalayan stations reporting December precipitation 99–100% below normal, has major downstream implications. Lower Plateau snow cover reduces the spring sensible heating that drives the land-sea thermal contrast for the East Asian Summer Monsoon. The framework models this as a reduction in the alignment forcing rate, predicting a **delayed and weakened monsoon onset**.

Meteorological drought has developed across eastern and southern China since mid-January, with severe conditions in most of Fujian, central Guangdong, and coastal Zhejiang. The JMA February–April forecast calls for above-normal temperatures but below-normal precipitation over southern East Asia—reinforcing the drought signal.

The spring transition will be volatile. The extreme cold reservoir clashing with warm, moist southerly flow from the South China Sea creates a sharp coherence gradient at the frontal boundary—the geometric signature of severe convective potential.

3.2 Predictions

Event	P (Aubur	C(t)	Classificatic	Window
Spring Festival freezing rain/ice storm (Hunan, Guizhou, Hubei); 2008 structural analog	68%	0.83	High	Feb 15–23
Severe dust storms (Beijing/Korea); "Black Storm" events from dry Mongolian soils and strong Siberian outflow	75%	0.79	High	Mar 1–30
Late cold surge causing crop damage in southern China; flowering crops vulnerable	71%	0.81	High	Late Mar
Spring drought intensification (SE China: Fujian, Guangdong, Zhejiang)	77%	0.76	High	Mar – May
Yangtze Basin severe convection (hail, squall lines); cold–warm air mass collision	62%	0.67	Moderate	Apr 10–30

Table 3: Auburn Framework predictions for China, Feb–May 2026.

3.3 High-Coherence Scenario: The Grand Clash (2008 Analog)

During the Spring Festival travel window (February 15–23, with 9.5 billion passenger trips expected), a deep trough taps the Siberian cold pool while South China Sea moisture feeds northward along a quasi-stationary frontal zone. The framework identifies the **2008 southern China ice storm** as the structural analog: negative AO, active South China Sea moisture flux, and a stalled frontal boundary produced a prolonged freezing rain event across Hunan, Guizhou, Hubei, and Anhui that paralyzed transportation and caused widespread infrastructure failure.

The Omega Block coherence indicates the blocking pattern would hold for an extended duration, preventing the frontal zone from translating and extending the freezing rain event beyond what standard models typically predict. The geometric stability of the Siberian High—its flow structure has minimized internal dissipation—means the cold air supply is sustained rather than episodic.

Compound Probability: 32% | **Pattern:** Omega Block + Quasi-Stationary Front

Prolonged freezing rain across central China during peak travel season; cold air geometrically sustained by vortex–Siberian High coupling.

4 Region 3: United States

Analysis Window: 25°N – 50°N, 125°W – 65°W | **Period:** Feb 5 – May 5, 2026

4.1 Coherence State

The United States presents a dramatic east-west dichotomy that mirrors the hemispheric coherence asymmetry.

4.1.1 Western United States

The Pacific regime is undergoing a critical phase shift. A persistent North Pacific Ridge has maintained a high-coherence blocking configuration that deflected the storm track north of California for weeks. Salt Lake City has received only 0.1 inches of snow against a seasonal average of approximately 33 inches. Colorado statewide snow water equivalent sits at 53% of median, with 38% of SNOTEL sites at record lows—only approximately 5% of water years have started this dry. On January 4, 2026, Western US snow cover hit the **lowest level in the 25-year MODIS satellite record**.

However, a pattern change is imminent. As MJO propagates from Phase 7 to Phase 8, the East Asian Jet extends, creating a high-coherence moisture transport corridor directed at the West Coast. The atmospheric river gradient index—which measures the alignment between moisture flux and the upper-level jet axis—shows strong jet-moisture coupling, classifying incoming events as Category 3–4 atmospheric rivers. Forecasters project atmospheric river events beginning February 8–9 targeting Washington and Oregon, with a stronger, longer-duration trough in week two.

The incoming AR sequence is a double-edged sword. While it brings critical moisture, the subtropical origin means freezing levels will be high (>6,000–7,000 ft). This creates **rain-on-snow physics** at middle elevations: rather than building the snowpack, rainfall melts existing thin snow cover and amplifies flood risk. California's 154 primary reservoirs hold 25.9 million acre-feet (123% of historic average) from earlier storms—a buffer—but the snowpack deficit represents a structural water supply risk for summer.

4.1.2 Eastern United States

The Eastern US is the primary target of the displaced polar vortex. The negative AO phase ($-2.5\,\sigma$) establishes a Cross-Polar Flow corridor through which the Baffin Bay daughter vortex funnels Arctic air directly into the Midwest and East Coast. The eastern third of the country has been running 15–30°F below normal through multiple Arctic outbreaks since mid-January. A late-January winter storm killed approximately 80 people across 16+ states. A historic nor'easter on January 31–February 1 brought record snow to the Carolinas and Virginia. Miami recorded 35°F on February 1—its lowest temperature since 2010.

The Gulf Stream North Wall provides the thermal contrast engine. Arctic air advecting over warm ocean creates intense baroclinicity—the atmospheric equivalent of tectonic stress accumulation. The framework's January 30–31 bomb cyclone case study verified at 83.1% predicted probability with observed coherence of 0.84 (HIGH), confirming the mechanism. The stratospheric signal predicts continued surface cold anomalies through late February as downwelling of the SSW completes over a 2–4 week window.

4.2 Predictions

Event	P (Aubur	C(t)	Classificatic	Window
California AR sequence (Cat 3–4); flood and debris flow risk in burn scars	81%	0.80	High	Feb 10–28
Historic nor'easter (bomb cyclone); mid-Atlantic and Northeast	76%	0.82	High	Late Feb – Early Mar
Rain-on-snow flooding (Sierra/Cascades, middle elevations)	69%	0.72	Moderate	Feb 12 – Mar 15
Spring tornado outbreak (Tornado Alley / Dixie Alley); retreating Arctic air meets Gulf moisture	73%	0.69	Moderate	Apr 1–30
Western snowpack deficit persists (<70% of average by April 1)	67%	0.77	High	Season

Table 4: Auburn Framework predictions for the United States, Feb–May 2026.

4.3 High-Coherence Scenario: The Miracle March (or Flood)

If the MJO stalls in Phase 8/1 and high-latitude blocking locks the storm track, a **storm train** directs 4–5 consecutive atmospheric rivers into California over a 15–20 day window. The blocking pattern would reset and re-establish between each AR event, creating a repeating cycle of coherent moisture transport. While this would recover snowpack at high elevations, the subtropical origin and high freezing levels convert middle-elevation precipitation to rain, triggering catastrophic Central Valley flooding. The debris flow risk in recent burn scars is elevated due to hydrophobic soil conditions.

The transcontinental variant: simultaneous heavy AR precipitation in the West, severe thunderstorms in the Central US (retreating Arctic air meets returning Gulf moisture), and a major nor'easter in the East—all within a single 3–5 day event window. This "coast-to-coast" storm scenario exploits the full east-west coherence dipole that the framework identifies as the dominant US atmospheric architecture during this period.

Compound Probability: 28% | **Pattern:** Repeating AR Train + Omega Block

Storm train of 4–5 atmospheric rivers locked onto California by persistent blocking; simultaneous severe weather across Central and Eastern US.

5 Region 5: Western Europe

5.1 Precursor Summary

Western Europe enters this window locked in one of the most active winter storm patterns in recent memory. The jet stream is displaced significantly south of its climatological position, steering repeated cyclones into Iberia and the UK. A major Sudden Stratospheric Warming event has suppressed the NAO into deeply negative territory ($-1.5\,\sigma$), and Scandinavian blocking has anchored high pressure over northeastern Europe, forcing Atlantic systems to stall or dive south. Six named storms have struck Iberia since January alone.

Soil moisture across northwestern Europe is saturated ($+1.5\,\sigma$). The UK recorded its wettest January on record in Cornwall and the wettest in 149 years in Northern Ireland. The North Atlantic SST tripole shows warm subtropics and persistent extratropical warmth ($+1.0$ to $+1.5\,^{\circ}$C), providing enhanced moisture for cyclones approaching the continent. Alpine snowpack stands at roughly 50% of seasonal average, with persistent weak layers creating avalanche danger.

The ECMWF seasonal forecast indicates above-average temperatures (+1.0 to +1.5 K) for February–March, but the SSW event—not well captured in seasonal models—may impose a cold bias analogous to the 2018 “Beast from the East.”

5.2 Auburn Framework Predictions

Event	P (Aubur	C(t)	Classificatio	Window
Catastrophic Iberian flooding; saturated soils + southern storm track + warm Atlantic SSTs	84%	0.86	High	Feb 5–Mar 15
SSW-driven cold outbreak (Beast from the East analog); Scandinavian block retrogrades west	68%	0.78	High	Mid-Feb – Early Mar
Compound riverine flooding (UK / Rhine); saturated soils + continued southern storm track	72%	0.74	Moderate	Mar – Apr
Alpine avalanche cycle; heavy southern-slope accumulation + weak persistent layers	65%	0.71	Moderate	Feb – Mar
Spring thaw flood pulse (Rhine / Danube); rapid block breakdown + warm advection over accumulated snow	58%	0.66	Moderate	Apr – May

Table 5: Auburn Framework predictions for Western Europe, Feb–May 2026.

5.3 High-Coherence Scenario: The Stationary Trough

If the Scandinavian block retrogrades west towards Greenland (forming a Greenland Block) and a low-pressure system stalls over the Bay of Biscay, it would pump warm, moist Atlantic air over an entrenched cold continental air mass. The coherence function for this configuration is estimated at $C(t) \geq 0.86$, indicating geometric persistence—the atmospheric pattern has minimized its internal dissipation pathways and will resist breakdown on synoptic timescales.

This would produce a **historic ice storm or heavy snow event** across France and Germany, followed by a rapid thaw and catastrophic flooding as the block finally collapses. The sequence maximizes compound hazard: freeze damage followed by flood damage across the same regions within a 7–14 day window.

The Iberian variant involves the southern storm track persisting through March, delivering cumulative totals exceeding 800 mm onto already-saturated soils. The October 2024 Valencia disaster (230+ fatalities) provides a direct analog for the flash flood risk in Mediterranean-draining catchments.

Compound Probability: 32% | **Pattern:** SSW Block Collapse → Ice Storm → Thaw Flood

Scandinavian block retrogrades to Greenland; warm Atlantic air overrides cold continental layer producing historic ice storm in France/Germany; block collapse triggers rapid thaw and multi-basin flooding on Rhine and Danube.

6 Region 6: Middle East

6.1 Precursor Summary

The Middle East enters this window with all surrounding waters running anomalously warm. The Eastern Mediterranean experienced an unprecedented marine heatwave in 2024 and remains approximately +0.5 to +1.5 °C above the 1991–2020 baseline. The Persian Gulf is warming at +0.36 °C per decade—4–8× the global average—while the Arabian Sea shows northwestern warming of +1.6 °C over the summer monsoon period 1971–2020.

Chronic drought defines the Fertile Crescent. Iraq has lost 40% of river levels over two decades, with 39% of its land affected by desertification. Seventy percent of Iraqi marshlands are now devoid of water. This depleted soil moisture creates a dual hazard: enhanced dust emission under any strong winds, and paradoxically heightened flash flood risk because parched, hardened soils cannot absorb sudden rainfall.

The subtropical jet stream is at its strongest and most equatorward position (25–30°N) in February, creating the month of maximum frequency for jet superposition events. The April 2024 UAE event (250 mm in a single day) was driven by exactly this mechanism: a potential vorticity streamer, Red Sea Trough, and anomalously warm SSTs enhancing moisture transport from the Arabian Sea. Iraq now experiences up to 270 dust storms annually, a dramatic increase from approximately 75 historically.

6.2 Auburn Framework Predictions

Event	P (Aubur	C(t)	Classificatior	Window
Severe dust storm sequence (Iraq / Arabian Peninsula); Shamal onset + desiccated soils	88%	0.72	Moderate	Mar – May
Flash flooding from Red Sea Trough / jet superposition event; UAE 2024 analog	62%	0.77	High	Mar – Apr
Early intense heat buildup (>50°C); accelerated regional warming trend	71%	0.68	Moderate	Apr – May
Tropical Plume extreme rainfall (Jeddah / Mecca / Amman corridor); MJO Phase 8/1 + RST coupling	48%	0.81	High	Mar – Apr

Table 6: Auburn Framework predictions for the Middle East, Feb–May 2026.

6.3 High-Coherence Scenario: Dust-to-Flood Cascade

A late-season Mediterranean trough generates a massive Shamal-driven dust storm over Iraq, reducing visibility to near-zero across the Tigris-Euphrates basin. The trough's cold front then interacts with anomalously warm Arabian Sea and Persian Gulf moisture (+0.5 to +1.5 °C SST anomalies) to trigger intense convective rainfall over the same parched soils, producing catastrophic flash flooding in the same region within 48–72 hours.

The coherence function for the jet superposition mechanism is estimated at $C(t) = 0.81$—classified HIGH—indicating that when the subtropical jet and polar jet align over the region, the resulting pattern exhibits geometric persistence. The April 2024 UAE event verified this mechanism: 250 mm fell in a single day under nearly identical synoptic architecture.

The compound nature of this scenario (dust followed immediately by flood) maximizes infrastructure damage and humanitarian impact across a region already under severe water stress.

Compound Probability: 22% | **Pattern:** Shamal Dust → Flash Flood Cascade

Late-season Mediterranean trough drives massive dust storm over Iraq; cold front interaction with warm Arabian Sea moisture triggers intense convective flooding over parched soils within 48–72 hours of dust event.

7 Region 7: South America

7.1 Precursor Summary

South America displays the classic La Niña precipitation dipole—an active SACZ corridor delivering heavy rainfall to central-southeastern Brazil while southern Brazil and Argentina bake under heat and dryness. Argentina is enduring an extreme heat wave: Bahía Blanca hit 39.1°C, Buenos Aires province shows over 80% of its territory in abnormally dry to moderate drought conditions, and Córdoba is approximately 38% under severe-to-exceptional drought.

The SACZ is fully operational, producing its first major episode of 2026 in early January with 150–200+ mm across Rio de Janeiro, Espírito Santo, Minas Gerais, and Goías. Research documents a multi-decadal poleward shift of the SACZ, increasing rainfall on its southern margin and elevating flood risk in precisely the densely populated areas of southeastern Brazil.

The Pacific signal is critical: the Niño 1+2 region off Peru/Ecuador has warmed +1.1 °C in 30 days—a classic signature of a downwelling Kelvin wave arriving at the coast. This "Coastal El Niño" signal often precedes heavy rainfall in coastal desert regions even before the basin-wide event establishes. Soil moisture is critically low in the Pampas ($-1.5\,\sigma$), and the Paraná River remains at crisis levels impacting hydropower and logistics. The Andes megadrought (2010–present) continues, with central Chile experiencing a 36% mean annual precipitation deficit.

7.2 Auburn Framework Predictions

Event	P (Aubur	C(t)	Classificatio	Window
Severe flooding and landslides in SE Brazil (Rio, São Paulo, Minas Gerais); vigorous SACZ + orographic enhancement	79%	0.76	High	Feb – Mar
Coastal El Niño flooding (Peru / Ecuador); Kelvin wave arrival + rapid SST warming	66%	0.73	Moderate	Mar – Apr
Intensifying agricultural drought in Argentine Pampas; La Niña legacy + positive SAM	74%	0.69	Moderate	Mar – May
Paraná River crisis (navigation / hydropower); upstream deficit propagation	71%	0.65	Moderate	Season
Andean cut-off low extreme rainfall; Pacific warming + detached trough over Chile/Argentina	44%	0.78	High	Mar – May

Table 7: Auburn Framework predictions for South America, Feb–May 2026.

7.3 High-Coherence Scenario: Wet Core / Dry Flanks

A simultaneous persistent heat dome over southern Brazil and Argentina (positive SAM suppressing cold fronts) coexists with vigorous SACZ episodes channeling Atlantic moisture into catastrophic urban flooding in the mountainous terrain of Rio de Janeiro and São Paulo states. The coherence function for the SACZ corridor reaches $C(t) = 0.76$—classified HIGH—indicating that the moisture transport pathway has achieved geometric alignment sufficient for multi-day persistence.

Between these two regimes sits a sharp rainfall void: the "dry flank" extending from the Pampas through southern Brazil. This wet core / dry flanks configuration maximizes multi-country impacts—simultaneous flooding in the southeast and drought intensification in the south, with agricultural losses compounding in both domains.

The Pacific variant involves the Coastal El Niño accelerating alongside a mid-latitude cut-off low stalling over central Chile. This combination draws warm, unstable air from the tropical Pacific into the Atacama and central Andes, producing massive flooding in one of the driest places on Earth while drought persists on the Atlantic side.

Compound Probability: 25% | **Pattern:** SACZ Flood + Pampas Drought Dipole
Persistent heat dome over Argentina coexists with vigorous SACZ flooding in SE Brazil; sharp rainfall void between the two regimes maximizes simultaneous compound impacts across 3+ countries.

8 Region 8: Southeast Asia and the Philippines

8.1 Precursor Summary

The Western Pacific has announced its intentions early. Tropical Storm Basyang (02W) made landfall on Mindanao on February 5 with 75 km/h sustained winds—the second named tropical cyclone of 2026 and the earliest back-to-back formation since 2019. Both systems formed over waters running 29–30°C, well above the 27°C threshold for tropical cyclogenesis. The Western Pacific Warm Pool is extraordinarily warm: Indonesian waters are approximately +2.0 °C above the climate average.

The mid-January MJO pulse in Phase 6 directly contributed to this early cyclogenesis through enhanced convection and a strong westerly wind burst over the warm pool—a burst now accelerating La Niña's oceanic collapse and promoting a significant downwelling Kelvin wave. The northeast monsoon remains active, with periodic cold surges from Chinese high-pressure systems. Thailand's TMD forecasts an intense cold surge February 24–28 bringing 2–5°C temperature drops.

PAGASA's climate outlook for February–July 2026 forecasts 4–11 tropical cyclones entering the Philippine Area of Responsibility. Temperature forecasts indicate above to "way above average" from May onward, with peak daytime maximums reaching 39.5°C in lowland Luzon and 38.1°C in Metro Manila. Indonesia's rainy season peaks in January–February with BMKG warning of very high rainfall potential in Banten, Central Java, and South Sulawesi.

8.2 Auburn Framework Predictions

Event	P (Aubur	C(t)	Classificatio	Window
Severe heat wave across Philippines and mainland SE Asia; ENSO transition + dry season peak	82%	0.71	Moderate	Apr – May
Early-season Western Pacific tropical cyclogenesis with rapid intensification; warm SSTs (+2.0 °C) + potential MJO re-emergence	70%	0.79	High	Mar – May
Indonesian urban flooding and landslides (Java / Sulawesi); peak rainy season + warm pool	75%	0.68	Moderate	Feb – Mar
Shear-line deluge (>500 mm) in Mindanao or Visayas; late cold surge + warm Philippine Sea	58%	0.74	Moderate	Feb – Mar
Mekong Basin agricultural drought; El Niño tendencies suppress western Luzon / Indochina rainfall	52%	0.63	Moderate	Apr – May

Table 8: Auburn Framework predictions for Southeast Asia and the Philippines, Feb–May 2026.

8.3 High-Coherence Scenario: Rapid Intensification Strike

El Niño tendencies emerge by Q2 2026, driving record heat and agricultural drought across western Luzon and the Mekong Basin in April–May. The warm-pool-fueled early-season typhoon undergoes rapid intensification (RI)—defined as $\geq$30 kt increase in 24 hours—over the anomalously warm Western Pacific (+2.0 °C). The coherence function for the RI mechanism reaches $C(t) = 0.79$, indicating that the thermodynamic environment has achieved sufficient geometric alignment to support sustained intensification without the typical shear-induced disruptions.

The compound dimension: the typhoon strikes drought-hardened landscape. Soil infiltration capacity is minimal, converting nearly all precipitation to surface runoff and producing flash flood devastation disproportionate to the storm's rainfall totals. The heat wave preceding the typhoon further compounds vulnerability through infrastructure stress and population exposure.

February TCs in the Philippine Area of Responsibility average only ∼0.3 per year; 2026 has already produced two, confirming the anomalous state of the warm pool.

Compound Probability: 20% | **Pattern:** El Niño Heat → RI Typhoon on Drought-Hardened Terrain
Record heat and agricultural drought from El Niño transition; early-season typhoon undergoes rapid intensification over +2.0 °C waters; strikes drought-hardened landscape producing catastrophic flash flooding.

9 Global Synthesis and Coherence Assessment

9.1 Cross-Regional Coherence Architecture

The global climate system for the February–May 2026 period is defined by **high meridional coherence** but **low zonal coherence**. This asymmetry is the dominant structural feature of the forecast window and governs the distribution of risk across all seven target regions.

Meridional coherence is driven by the coupling between the stratosphere (split polar vortex, $+4.0\,\sigma$ temperature anomaly at 10 hPa) and the troposphere (negative AO at $-2.5\,\sigma$). This vertical alignment drives deep cold air outbreaks into the Northern Hemisphere mid-latitudes—simultaneously affecting the eastern United States, Western Europe, and East Asia—while reinforcing the blocking patterns that lock these regimes in place. The coherence function for this stratosphere-troposphere coupling is estimated at $C(t) \geq 0.82$ across the Northern Hemisphere, indicating that the SSW surface signal will persist through at least mid-to-late February with potential extensions into March.

Zonal coherence is fragmenting as the Walker Circulation breaks down during La Niña's decay. The atmosphere is in a "sloshing" mode where the dominant tropical forcing shifts from the Pacific Basin to intraseasonal drivers like the MJO. This creates forecast uncertainty in the tropics while the mid-latitude signal remains anomalously clear.

9.2 Precursor Signal Summary

9.3 Simultaneous Multi-Region Risk Assessment

Several precursor signals are converging across regions simultaneously, creating a period of elevated global weather risk. The Auburn Framework identifies the following cross-regional coherence signatures:

1. **La Niña collapse timing** is the single most important variable. The oceanic signal is dying but the atmospheric response lags by 1–2 months. This transition phase—when oceanic and atmospheric ENSO states decouple—is historically associated with pattern volatility and increased forecast uncertainty across all seven regions. The emerging subsurface Kelvin wave suggests potential rapid transition toward El Niño later in 2026.
2. **The SSW / polar vortex disruption** radiates impacts across the entire Northern Hemisphere

Precursor	Current Value	Anomaly (σ)	Regions Affected
ENSO (ONI)	$-0.5\,°\mathrm{C}$	-0.5	All (transition uncertainty)
Stratospheric Temp (10 hPa)	$+50\,°\mathrm{C}$ above clim.	$+4.0$	US, Europe, China, Middle East
Arctic Oscillation	-2.5	-2.5	US, Europe, China
W. Pacific Warm Pool SST	$+2.0\,°\mathrm{C}$	$+2.0$	SE Asia, Philippines, Australia
Siberian High	$> 1080\,\mathrm{hPa}$	$> +3.5$	China, SE Asia, Middle East
N. Atlantic SST Tripole	$+1.0$ to $+1.5\,°\mathrm{C}$	$+1.2$	Europe, US East Coast
Niño 1+2 Warming	$+1.1\,°\mathrm{C}$ / 30 days	$+2.0$ (trend)	South America (Pacific coast)
Soil Moisture (global)	Polarized extremes	±1.5	All (amplifies both flood and drought)

Table 9: Global precursor signal summary as of February 5, 2026.

simultaneously. It drives extreme cold in the eastern US and East Asia, strengthens Greenland blocking that displaces European storm tracks southward, and modulates the subtropical jet controlling Middle Eastern precipitation. The surface cold signal should persist through at least mid-to-late February with potential extensions into March.

3. **Record-warm ocean basins** are loading the atmosphere with moisture globally. The Western Pacific Warm Pool at $+2.0\,°\mathrm{C}$, above-normal North Atlantic SSTs, warm Mediterranean, and elevated Arabian Sea temperatures collectively increase the available energy for extreme precipitation. When synoptic triggers tap this moisture, rainfall intensities exceed historical norms—the distribution has shifted rightward across all regions.
4. **Soil moisture polarization** amplifies both tails of the hazard distribution. Saturated soils across the UK, southeastern Brazil, and tropical Australia amplify flood risk from any additional rainfall. Depleted soils across the Fertile Crescent, Argentine Pampas, western US, southeastern China, and southern Australia amplify drought, fire, and dust risk while paradoxically increasing flash flood vulnerability when rain does arrive.

10 Top Global Risks: February–May 2026

The Auburn Framework identifies three compound risk scenarios with cross-regional significance. Each exploits the simultaneous alignment of multiple precursor signals across geographic boundaries.

10.1 Risk 1: The California Flush

The alignment of the MJO Phase 8, a collapsing North Pacific Ridge, and an active undercut jet stream puts California at high risk of a “March Miracle” precipitation event that turns into a flood disaster due to rain-on-snow physics. The subtropical origin of the airmass raises freezing levels above 6,000–7,000 ft, converting middle-elevation precipitation to rain and triggering rapid snowmelt atop an already-thin snowpack.

10.2 Risk 2: Eurasian Freeze-Thaw Whiplash

The extreme Siberian High ($> +3.5\,\sigma$) and persistent Scandinavian blocking establish a late-winter freeze across the Northern Hemisphere mid-latitudes—from the Yangtze Basin through Central

Parameter	Assessment
Auburn Probability	69% (storm train); 28% (compound coast-to-coast)
Coherence	$C(t) = 0.80$ (HIGH)
Mechanism	AR train + omega block + rain-on-snow cascade
Regions Coupled	US West Coast, Central Valley, Sierra Nevada
Historical Analog	1862 Great Flood (less extreme); 2017 Oroville sequence

Europe to the US Midwest. The subsequent block collapse triggers rapid thaw across all three regions near-simultaneously, maximizing flood potential on the Rhine, Danube, Yangtze, and Upper Mississippi as accumulated snow melts under warm advection.

Parameter	Assessment
Auburn Probability	58% (individual basin flood); 24% (multi-basin simultaneous)
Coherence	$C(t) = 0.78$–0.86 (HIGH across multiple windows)
Mechanism	SSW-driven block → late freeze → abrupt thaw → multi-basin flood
Regions Coupled	Europe (Rhine/Danube), China (Yangtze), US (Mississippi)
Historical Analog	2018 Beast from the East (cold phase); 2013 Central European floods (thaw phase)

10.3 Risk 3: South American Dipole

The rapid warming of Niño 1+2 alongside Atlantic-side dryness creates a sharp gradient of risk across the continent: floods in the west (Andes / Pacific coast) driven by the Coastal El Niño, and drought in the east (Pampas / Paraná Basin) driven by the atmospheric response. The SACZ simultaneously channels moisture into catastrophic flooding in southeastern Brazil. Three distinct hazard modes operate across a single continent within the same forecast window.

Parameter	Assessment
Auburn Probability	79% (SE Brazil flood); 74% (Pampas drought); 66% (Coastal El Niño)
Coherence	$C(t) = 0.73$–0.76 (HIGH for SACZ; MODERATE for Pacific)
Mechanism	SACZ flood + Pampas drought + Coastal El Niño—three simultaneous modes
Regions Coupled	Brazil, Argentina, Peru/Ecuador, Chile
Historical Analog	2017 Coastal El Niño (Pacific); 2011 Rio landslides (SACZ)

11 Conclusion

The February–May 2026 window opens with a rare density of large-scale atmospheric forcings operating simultaneously. Three observations emerge from this precursor survey.

First, the **ENSO transition is the dominant source of both risk and uncertainty**. It is simultaneously winding down La Niña's familiar teleconnections while failing to establish a clear replacement pattern, creating a forecast environment where analogs are scarce and model spread is wide. The Auburn Framework's coherence-gated approach is specifically designed for this regime: rather than relying on ENSO-analog composites, it diagnoses the geometric alignment of the atmosphere in real time.

Second, the **SSW event is the most actionable near-term signal**. Surface impacts are already manifesting across four of seven target regions, and the 2–4 week influence window extends through late February into early March. The coherence function for stratosphere-troposphere coupling exceeds $C(t) = 0.82$ across the Northern Hemisphere—classified HIGH—indicating that the displaced polar vortex pattern will persist beyond standard model predictions.

Third, the persistent **global ocean heat surplus** means that any synoptic-scale trigger will tap a deeper moisture reservoir than historical analogs suggest. Rainfall intensity distributions should be assumed to have shifted rightward across all regions. The framework captures this through the coherence-weighted probability architecture: warm SSTs enhance raw event probabilities, while the coherence function determines whether the atmospheric geometry can sustain the moisture transport pathways long enough to produce extreme accumulations.

The base rate for at least one high-impact weather event occurring somewhere across these seven regions during any given February–May window is effectively 100%. What distinguishes the current precursor alignment is the **breadth and simultaneity of elevated signals**—multiple regions showing anomalies exceeding $\pm 1.5\,\sigma$ across multiple parameters at once.

Monitoring priorities for the next 90 days:

1. SSW surface coupling evolution (Northern Hemisphere cold outbreak timing and persistence)
2. MJO re-emergence potential (any Phase 4–6 signal is significant for the Western Pacific and Australia)
3. Subsurface Kelvin wave propagation speed (the key El Niño precursor, governing South American and SE Asian risk)
4. SACZ persistence and position (the primary indicator of Brazilian compound event risk)
5. Scandinavian block longevity (determines European storm track through spring)

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