

2026 WORLD AEROBATIC CHAMPIONSHIP

Meteorological Planning Assessment

Mason City, Iowa (KMCW)
Competition dates: August 24 - September 2, 2026

Comparison venues: WAAC 2025 Sarmellek, Hungary; WAAC 2023 Jean, Nevada; WAC 2024 Zamosc, Poland

Prepared for championship planning, venue briefing, and stakeholder coordination.
This document uses long-term climate normals and publicly available event/venue information. It is not a substitute for daily aviation forecasts, TAFs, METARs, convective outlooks, or contest-day meteorological briefings.

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1. Executive Summary

Late August at Mason City Municipal Airport (KMCW) is a favorable climatological window for international aerobatic competition. The most important planning advantages are moderate summer temperatures, relatively light average surface winds, generally good visibility, and a morning-to-early-afternoon flying window that is typically more reliable than late afternoon. The principal weather limitation is convective precipitation, especially isolated showers or thunderstorms during the late afternoon and evening.

Planning Parameter	Mason City Late-August Expectation
Afternoon high temperature	78-82 deg F typical
Morning low temperature	56-61 deg F typical
Surface wind	6-12 kt operational planning range; August average about 8-9 mph
600 m AGL / about 2,000 ft wind	10-18 kt typical planning range; 12-15 kt central planning value
Wet-day probability	roughly one-third of August days; lower operational risk in the morning
Primary operational hazard	afternoon/evening thunderstorms and associated outflow winds

The comparison with recent championships is useful but should be interpreted carefully. Jean, Nevada is much drier but exposed to stronger wind and higher density-altitude considerations. Sarmellek, Hungary and Zamosc, Poland are broadly comparable temperate continental venues, though Zamosc 2024 was described by participants as hot nearly every day with thunderstorms during the final days. Mason City appears competitive from a climate-risk standpoint because its strongest disadvantage - convective rain risk - is typically time-of-day dependent and can often be mitigated through morning scheduling.

2. Scope and Methodology

This report is intended for planning. It does not predict the specific weather that will occur in August and September 2026. Instead, it evaluates expected conditions using climate normals, long-term average weather summaries, airport characteristics, and public reporting from comparable championship sites.

Methodology:

- Use late-August climatology for Mason City, Iowa, with emphasis on the competition period from August 24 through September 2.
- Translate general climate data into aviation-relevant planning values for surface winds, winds near 600 m AGL, density altitude, visibility, and convective timing.
- Compare Mason City to recent championship venues using climate-season analogs and publicly available championship reports.
- Identify operational mitigation measures suitable for contest scheduling and pilot briefings.

Important limitation: Winds aloft and density altitude values in this planning report are estimates derived from climatology and standard boundary-layer assumptions. Daily contest operations should use observed and forecast winds from ASOS, model soundings, TAF/METAR products, NWS aviation forecasts, and on-site meteorological briefings.

3. Mason City Climatological Overview

3.1 Temperature

Mason City average high temperatures decrease from about 82 deg F at the beginning of August to about 78 deg F at the end of August, while average lows decrease from about 63 deg F to about 58 deg F. For the WAC 2026

contest window, a practical planning range is afternoon highs near 78-82 deg F and morning lows near 56-61 deg F.

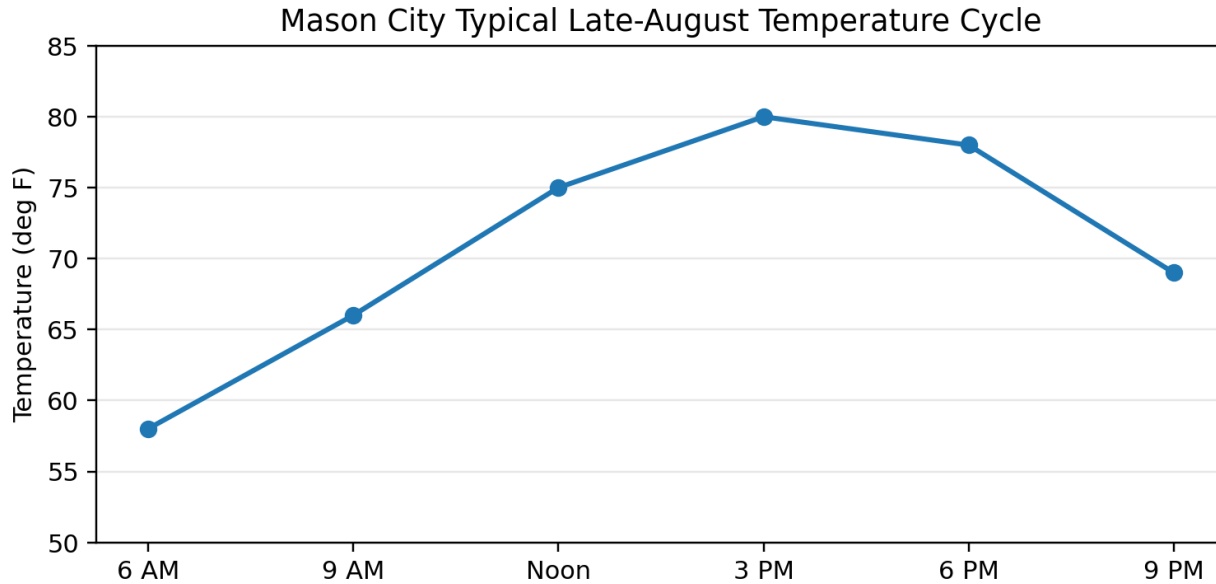


Figure 1. Representative late-August daily temperature cycle for Mason City planning purposes.

3.2 Surface Winds

August is one of the calmest portions of the year at Mason City. Average hourly wind speed during August increases only gradually, from about 8.2 mph to 9.1 mph across the month, and the lowest daily average wind speed occurs in early August. The predominant August wind direction is from the south, with southerly flow peaking late in the month.

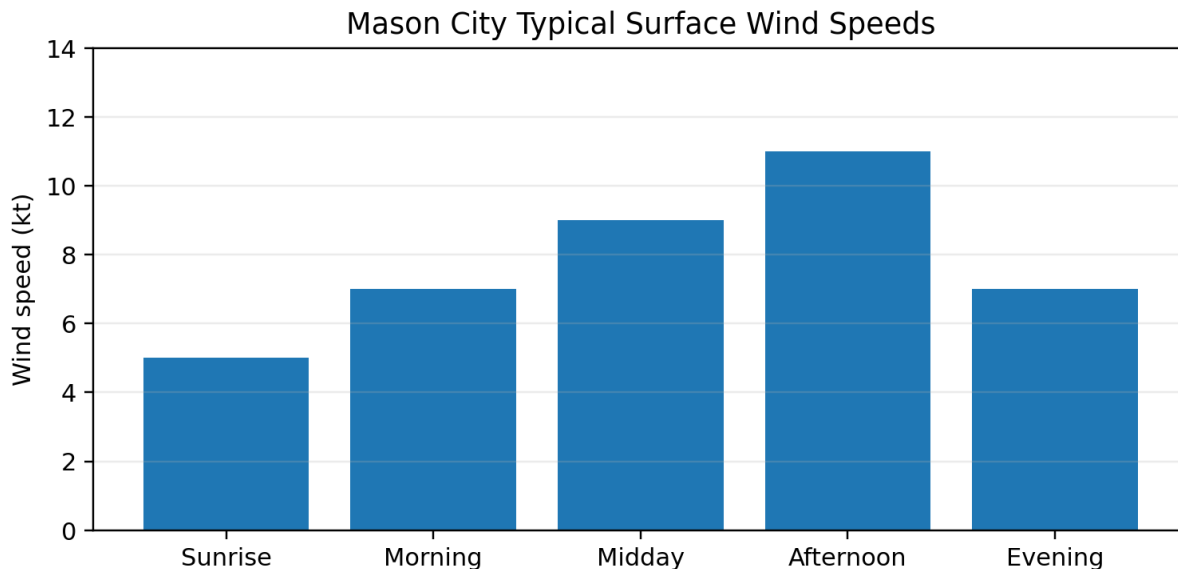


Figure 2. Typical diurnal surface wind profile in knots. Afternoon mixing usually produces the strongest surface winds of the day.

Mason City August Prevailing Wind Direction (illustrative climatological distribution)

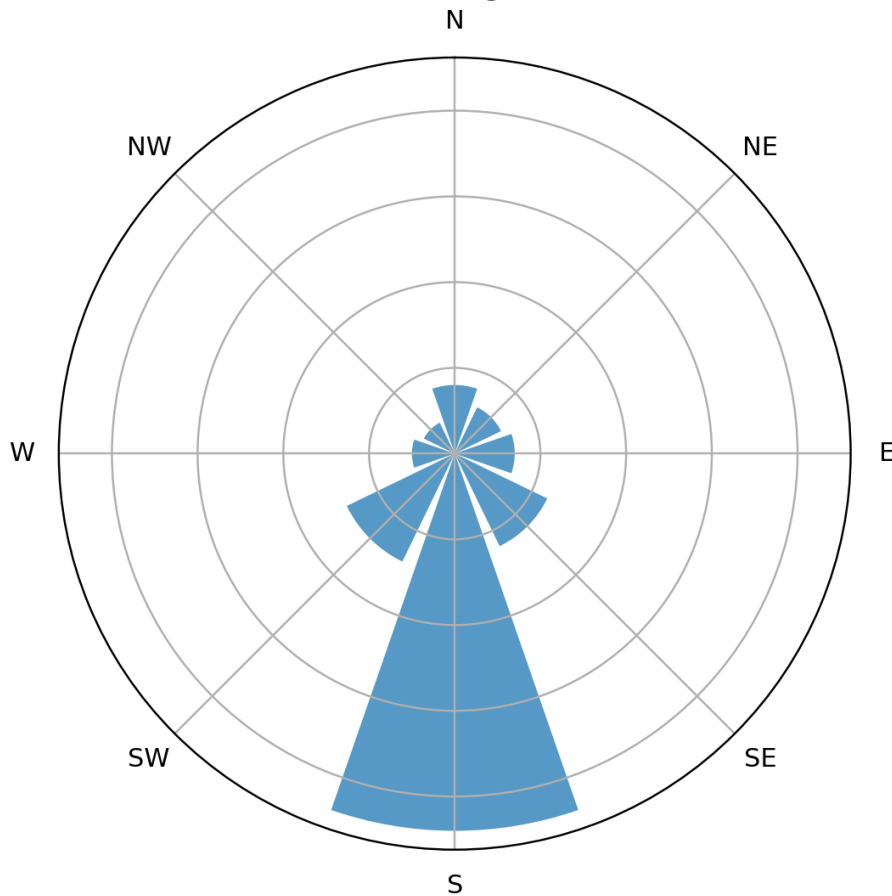


Figure 3. Illustrative August wind-direction distribution based on southerly prevailing flow; this is not a raw ASOS wind rose.

3.3 Rainfall, Thunderstorms, and Cloud Cover

A wet day in Mason City is defined in the cited climate summary as at least 0.04 inches of liquid precipitation. The chance of a wet day decreases from roughly 37% at the start of August to roughly 33% by the end of the month. Average 31-day rainfall decreases modestly from about 3.8 inches to 3.5 inches across August. Cloud cover is relatively stable, with overcast or mostly cloudy conditions around 30% of the time.

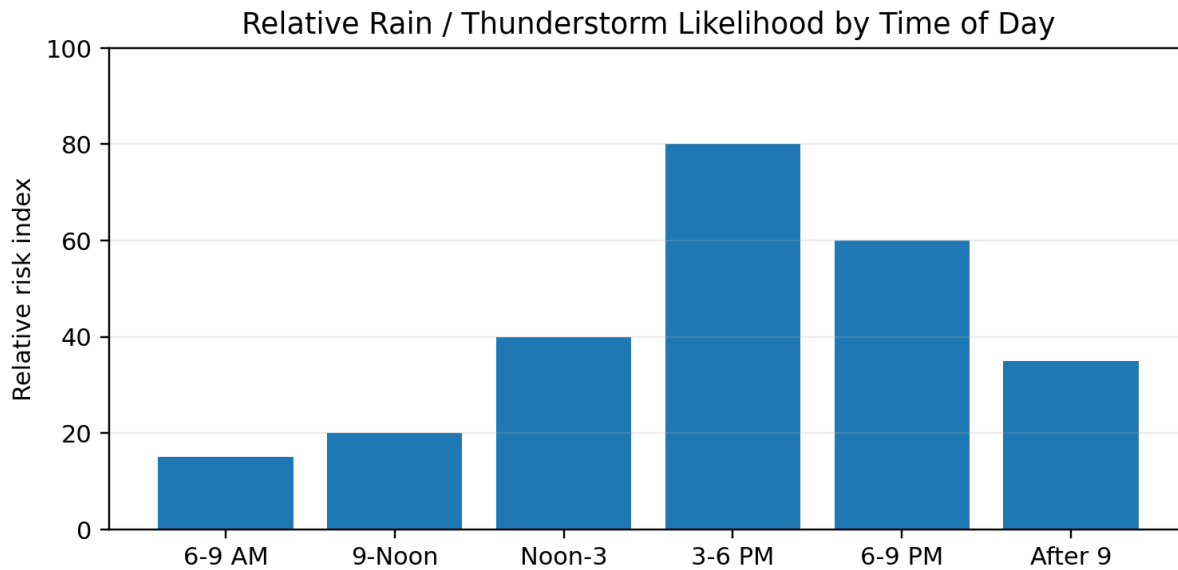


Figure 4. Relative timing of convective precipitation risk. This emphasizes operational timing rather than deterministic probability.

4. Aviation Operational Analysis

4.1 Most Reliable Flying Window

The strongest operational conclusion is that the contest should plan to maximize flying from sunrise through early afternoon. This window generally combines lower temperatures, lighter winds, less thermal turbulence, lower probability of convective precipitation, and improved pilot comfort. By mid-to-late afternoon, surface heating increases thermal activity and storm/outflow risk.

- Primary window: sunrise to approximately 2 PM local time.
- Secondary window: early evening after convective activity has dissipated, if daylight and contest procedures allow.
- Higher-risk window: roughly 3 PM to 8 PM, when isolated thunderstorms and gust fronts are most likely.

4.2 Temperature and Density Altitude

KMCW field elevation is approximately 1,214 ft MSL. At typical late-August afternoon temperatures near 80 deg F, a rough density-altitude planning value is approximately 2,700-3,000 ft MSL. This is materially lower than high-desert venues such as Jean, Nevada and should be manageable for unlimited aerobatic aircraft, though pilots should still account for density altitude during takeoff, climb, and repeated sequence flying.

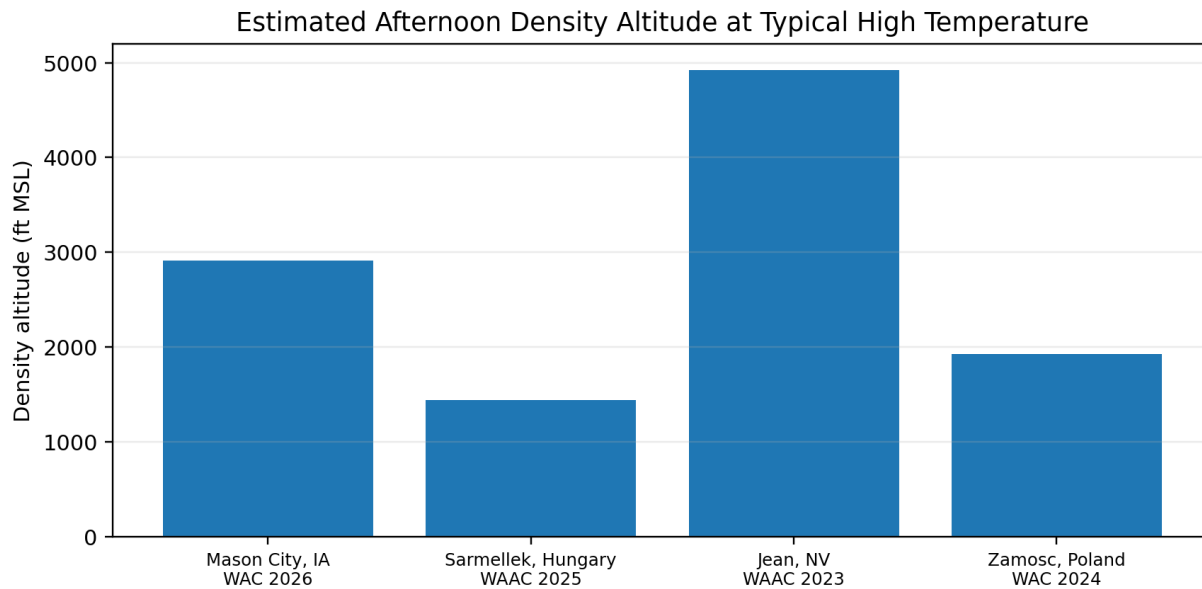


Figure 5. Estimated density altitude comparison using typical championship-season high temperatures. Values are approximate planning figures.

4.3 Visibility and Ceilings

Late August typically supports VFR operations in northern Iowa. The most likely short-duration visibility restrictions are early-morning ground fog after overnight rain and localized visibility reductions near showers or thunderstorms. Persistent multi-day low ceilings are not the dominant climatological risk for this period.

5. Contest Box Drift and Winds Aloft

Aerobatic competition is especially sensitive to winds in the working altitude band. For planning purposes, the most relevant layer for lower-box positioning and sequence drift is approximately 600 m AGL, or about 2,000 ft AGL. Late-summer convective mixing usually increases wind speeds above the surface, especially by midday and afternoon.

Altitude	Typical Planning Wind	Operational Meaning
Surface	6-12 kt	Generally manageable for airport operations and ground activity.
1,000 ft AGL	8-15 kt	Light to moderate drift; manageable with normal box positioning.
2,000 ft AGL / 600 m	10-18 kt	Core planning layer for sequence drift; use 12-15 kt central estimate.
3,000 ft AGL	12-22 kt	May influence upper lines, verticals, and re-centering strategy.

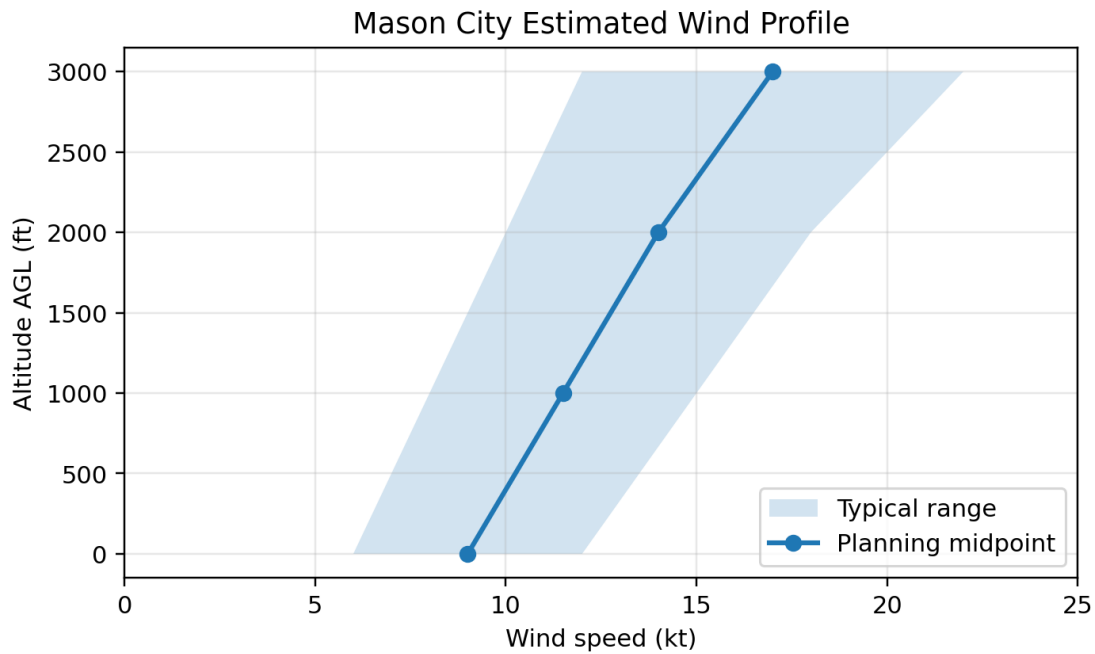


Figure 6. Estimated wind profile for Mason City. Daily observations and model soundings should supersede this planning estimate.

5.1 Box Drift Example

At 600 m AGL, a 15 kt wind equals approximately 25 ft/sec of horizontal drift. Over a 10-second vertical or positioning segment, the aircraft/sequence reference may move roughly 250 ft downwind unless corrected. At 20 kt, drift increases to roughly 340 ft over 10 seconds. These values are not limiting by themselves, but they illustrate why winds aloft are more important than the surface wind alone for contest operations.

6. Runway and Airport Considerations

Mason City Municipal Airport provides two substantial asphalt runways. The airport website lists field elevation of 1,214 ft MSL, Runway 18/36 at 6,501 ft by 150 ft, and Runway 12/30 at 5,502 ft by 150 ft. The presence of both north-south and northwest-southeast runway options is favorable for changing wind directions during late-summer frontal passages.

Airport	Elevation	Runways	Competition relevance
Mason City KMCW	1,214 ft	18/36 and 12/30	Low elevation, two runway orientations, good runway length.
Jean 0L7	approx. 2,835 ft	02L/20R and 02R/20L	High desert elevation; wind exposure and DA are key factors.
Zamosc EPZA	approx. 751 ft	12/30	Lower elevation; one primary runway orientation.

7. Weather Risk Matrix

Hazard	Probability	Operational Impact	Mitigation
Morning fog after rain	Low to moderate	Delay first flights	Monitor overnight rainfall, dew point spread, ASOS observations.
Afternoon thunderstorms	Moderate	Temporary suspension, gust	Prioritize morning flying; use

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		fronts, lightning	radar/lightning monitoring and conservative restart rules.
Strong surface winds	Low to moderate	Ground handling and safety limits	Use runway options; brief wind limits; monitor post-frontal periods.
Strong winds aloft / box drift	Low to moderate	Pilot workload and judging consistency	Use winds aloft briefings and adjust box positioning expectations.
Extreme heat	Low	Pilot fatigue and DA increase	Hydration, shade, schedule intense operations earlier.
Multi-day weather shutdown	Low	Contest completion risk	Maintain schedule discipline; use all suitable morning windows.

8. Comparison with Recent Championship Venues

The comparison below is not intended to prove that one venue is universally superior. Each site has different operating limits, terrain, runway environment, season, and championship requirements. The purpose is to put Mason City into context against recent international aerobatic championships.

Venue / event	Season	Typical high	Typical low	Wind issue	Precipitation issue	Overall risk character
Mason City, Iowa - WAC 2026	Late Aug	78-82 F	56-61 F	Generally light; south prevailing	Moderate PM convective risk	Balanced; schedule-sensitive but favorable
Sarmellek, Hungary - WAAC 2025	Mid Sep	low-mid 70s F	low-mid 50s F	Northerly common through late Sep	Showers/frontal systems delayed	Rain prevented four programs
Jean, Nevada - WAAC 2023	Late Oct/early Nov	around 80 F	mid-50s F	Exposure/cross-box limits	Very dry	Dry but wind limited delayed
Zamosc, Poland - WAC 2024	Mid-late Aug	low-mid 70s F climatology; hot in 2024	mid-50s F	Moderate continental winds	Thunderstorms in final days	Completed all programs

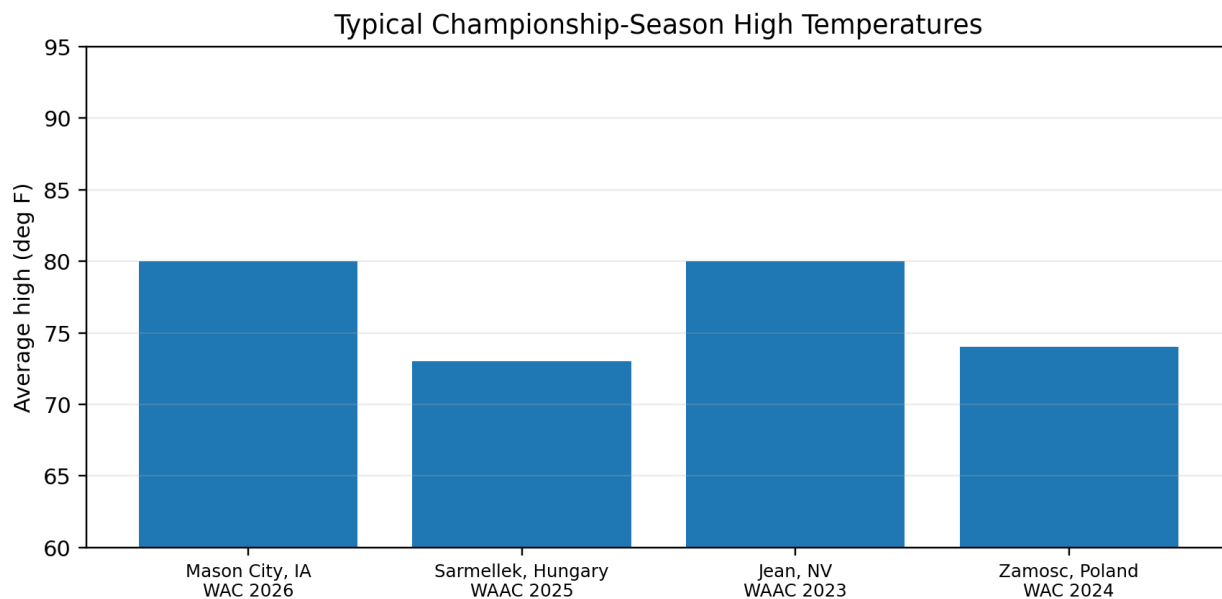


Figure 7. Typical high-temperature comparison for the championship season at each venue.

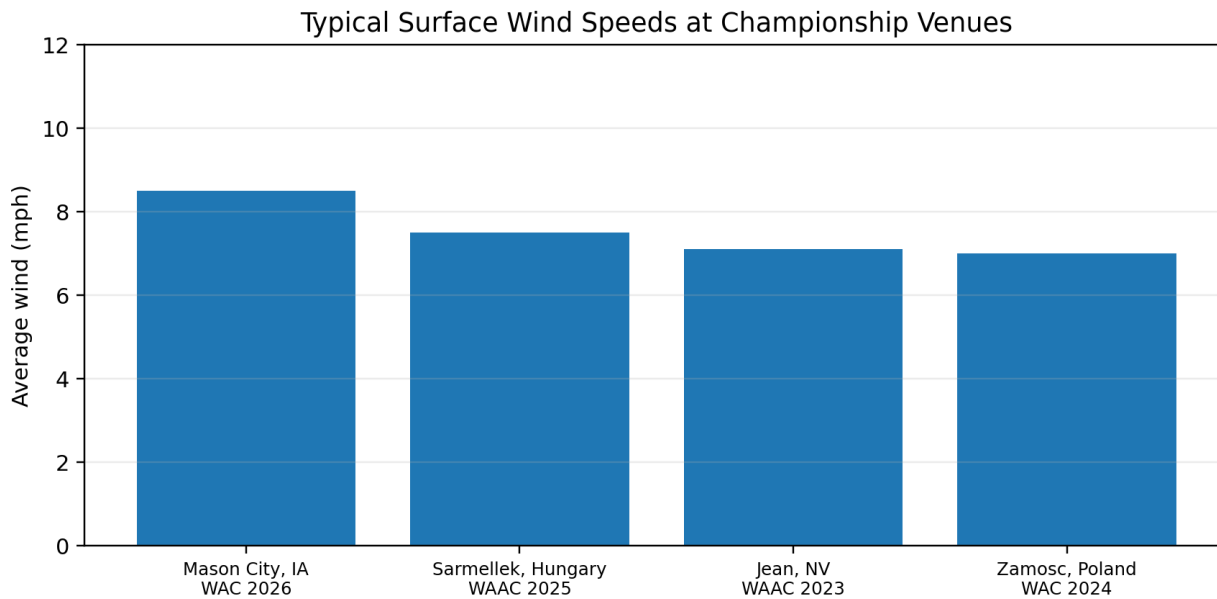


Figure 8. Typical surface wind comparison. Local exposure and winds aloft can matter more than average wind speed alone.

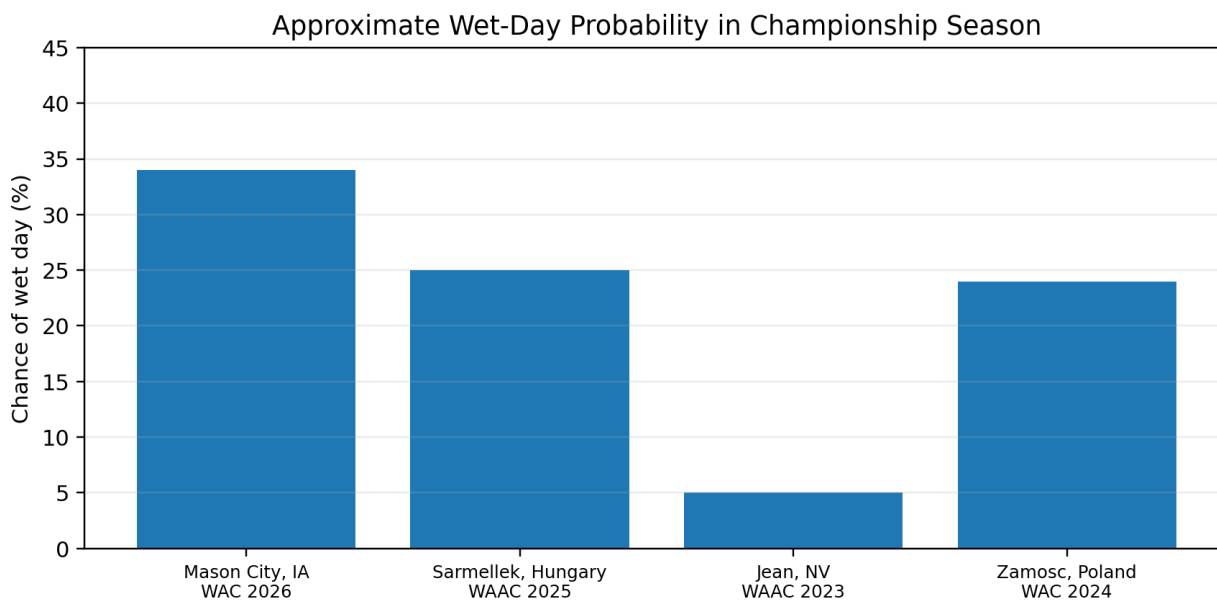


Figure 9. Approximate wet-day probability comparison. Jean is much drier; Mason City has greater precipitation risk but usually in a manageable diurnal pattern - ie afternoon showers rather than full-day rain

8.1 WAAC 2025 - Sarmellek, Hungary

WAAC 2025 was held at Heviz-Balaton Airport (LHSM), Sarmellek, Hungary, from September 12-20, 2025. The site is a low-elevation continental European venue near Lake Balaton. Climate summaries for nearby Heviz indicate a seasonal wind pattern in which northerly winds are most frequent through late September. In operational terms, Sarmellek is broadly comparable to Mason City in that it is not a high-density-altitude desert site, but it carries the variability typical of central European frontal weather.

8.2 WAAC 2023 - Jean, Nevada

WAAC 2023 was held at Jean Airport (0L7), approximately 20 minutes south of Las Vegas. Jean is a high-desert venue at approximately 2,835 ft MSL with two parallel paved runways. The climate is very dry compared with Iowa, but the key operational tradeoff is exposure to wind and higher density altitude. Public team/championship reporting identified wind as a significant operational consideration, and user-provided contest experience from the 2023 championship also notes substantial wind-related delays. For Mason City planning, Jean is the clearest example that low precipitation risk does not automatically mean low contest-weather risk.

8.3 WAC 2024 - Zamosc, Poland

WAC 2024 was held at Zamosc-Mokre Airfield (EPZA), Poland, during mid-to-late August. CIVA lists the event at Zamosc-Mokre Airfield, and CIVA Results identifies the 2024 WAC as occurring at Mokre/Zamosc from August 15-25, 2024. A Swiss Aerobatic Association report described hot weather nearly every day and stated that all four programs were completed despite thunderstorms during the last days. This makes Zamosc a useful analog for Mason City: a temperate venue can still experience heat and thunderstorms, but disciplined scheduling can allow completion of the full championship program.

9. Operational Planning Recommendations

- Plan daily flight operations around the morning and early-afternoon reliability window; adjust late-afternoon availability based on storm development
- Schedule the most time-sensitive contest programs early in the day when possible.
- Establish a daily weather briefing rhythm: pre-dawn outlook, mid-morning update, early-afternoon convective update, and restart/no-restart decision if thunderstorms occur.
- Use ASOS observations, terminal forecasts, radar, lightning data, HRRR/RAP soundings, and winds aloft products for contest-day decisions.
- Prepare weather-hold procedures for lightning, gust fronts, and post-storm outflow boundaries.
- Build schedule slack for 1-2 isolated convective interruptions over the event period, while recognizing that full multi-day shutdowns are not the primary climatological risk.

10. Source Notes and References

1. CIVA News, 33rd FAI World Aerobatic Championships 2026: Mason City Airport, Iowa (KMCW); training dates August 20-23 and competition dates August 24-September 2, 2026. <https://www.civanews.com/events/33rd-fai-world-aerobatic-championships/>
2. 2026 WAC official website: event dates August 23-September 2, 2026 and event overview. <https://2026wac.com/>
3. WeatherSpark, August Weather in Mason City, Iowa: high/low temperature trends, cloud cover, wet-day probability, rainfall, wind speed and direction. <https://weatherspark.com/m/10364/8/Average-Weather-in-August-in-Mason-City-Iowa-United-States>
4. Mason City Municipal Airport airfield information: elevation 1,214 MSL; runway dimensions for 18/36 and 12/30. <https://flymcw.com/airfield-information/>
5. CIVA News, 16th FAI World Advanced Aerobatic Championships 2025: Heviz-Balaton Airport, Sarmellek, Hungary. <https://www.civanews.com/events/16th-fai-world-advanced-aerobatic-championships/>
6. WeatherSpark, Heviz, Hungary climate summary: temperature, precipitation, and wind-direction climatology. <https://weatherspark.com/y/82259/Average-Weather-in-Heviz-Hungary-Year-Round>

7. IAC, News & Updates Advanced Team: WAAC 2023 at Jean Airport, Las Vegas, Nevada, October 24-November 3, 2023. <https://www.iac.org/news-updates-advanced-team>
8. Harry Reid International Airport, Jean Sport Aviation Center: elevation and runway information. <https://www.harryreidairport.com/jean-sport-aviation-center>
9. WeatherSpark, Las Vegas climate summary: rainfall and seasonal wind context used as nearest large-station analog for Jean, Nevada. <https://weatherspark.com/y/2228/Average-Weather-in-Las-Vegas-Nevada-United-States-Year-Round>
10. CIVA News, 32nd FAI World Aerobatic Championship 2024: Zamosc-Mokre Airfield, Poland. <https://www.civanews.com/events/32nd-fai-wac/>
11. CIVA Results, 32nd FAI WAC 2024 at Airfield Mokre/Zamosc, Poland from August 15-25, 2024. https://www.civa-results.com/2024/WAC_24/indexpage.htm
12. Swiss Aerobatic Association, WAC 2024 report: hot weather nearly every day; all four programs completed despite thunderstorms during the last days. <https://www.saa.ch/wac2024/>
13. WeatherSpark, Zamosc, Poland climate summary: temperature and precipitation climatology. <https://weatherspark.com/y/90226/Average-Weather-in-Zamosc-Poland-Year-Round>
14. CIVA venue listing for Zamosc-Mokre Airfield EPZA: runway 12/30 and airport location. <https://www.civanews.com/venue/zamosc-mokre-airfield-epza/>

Prepared as a planning assessment. Final operational decisions should be made using current aviation weather products, contest rules, and the judgment of the Contest Director, Chief Judge, Safety Director, and designated meteorological briefer.