

US Urban Climate Analysis: 50 Metropolitan Areas, 2.2M Hourly Observations (2021-2026)

Generated Report

January 30, 2026

Content

Executive Summary

This comprehensive analysis examines **2,191,200** hourly weather observations across 50 major US metropolitan areas over a 5-year period (2021-2026), providing enterprise-scale climate intelligence for urban planning, energy forecasting, and risk assessment.

Key Findings

- **Average Temperature (All Cities):** 61.14°F
- **Record High:** 117.9°F
- **Record Low:** -33.6°F
- **Temperature Trend:** -4.382°F per year

Temperature Analysis

Hottest Cities (5-Year Average)

City	Avg Temp (°F)
Miami	76.87°F
Mesa	75.26°F
Honolulu	75.23°F
Phoenix	74.92°F
Tampa	73.3°F

Coldest Cities (5-Year Average)

City	Avg Temp (°F)
Detroit	51.35°F
Denver	50.54°F
Milwaukee	49.67°F
Minneapolis	47.01°F
Anchorage	36.94°F

Annual Temperature Trends

Year	Avg Temperature (°F)
2021	62.6°F
2022	60.43°F
2023	61.32°F
2024	61.83°F
2025	61.34°F
2026	40.69°F

Extreme Weather Events

- **Hours Above 100°F:** 19,456
- **Hours Below 32°F:** 161,824
- **Heavy Precipitation Hours (>0.5 in/hr):** 823

Energy Demand Indicators

Highest Heating Degree Days

City	HDD (5-Year Total)
Anchorage	51,307
Minneapolis	36,925
Milwaukee	31,780
Denver	30,752
Detroit	29,200

Highest Cooling Degree Days

City	CDD (5-Year Total)
Mesa	23,831
Phoenix	23,690
Miami	22,029
Las Vegas	20,005
Honolulu	18,688

Precipitation Analysis

Wettest Cities (5-Year Total)

City	Total Precipitation (in)
Houston	364.74"
Nashville	343.03"
Orlando	338.8"
New Orleans	333.35"
Miami	310.67"

Regional Analysis

Region	Cities	Avg Temp (°F)	Avg Humidity (%)
Southwest	6	69.82°F	33.42%
Texas	5	69.78°F	66.08%
Southeast	9	67.66°F	73.36%
West Coast	8	59.67°F	68.59%
Pacific	2	56.09°F	74.51%
Northeast	5	54.64°F	69.58%
Mountain	2	54.1°F	61.61%
Midwest	11	53.08°F	69.79%

Diurnal Patterns

- **Hottest Hour:** 16:00
- **Coldest Hour:** 6:00
- **Average Diurnal Range:** 14.61°F

Methodology

Data sourced from Open-Meteo Historical Weather API, capturing:

- Hourly observations from 50 major US metropolitan areas
- 5-year period: 2021-01-31 to 2026-01-30
- Variables: Temperature, Humidity, Precipitation, Wind Speed, Pressure

Data Quality

- **Total Observations:** 2,191,200
- **Cities:** 50 major metros
- **Temporal Resolution:** Hourly
- **Generated:** 2026-01-30 22:17 EST

Data Verification

All data can be independently verified at:

- **Source:** Open-Meteo Historical Weather API
- **Documentation:** <https://open-meteo.com/en/docs/historical-weather-api>

Clean Metrics Studio