CLIMATE CENTRAL

Monthly Attribution Overview - January 2025

An analysis of how climate change influenced U.S temperatures in January 2025

Using Climate Central's Climate Shift Index (CSI) tool to measure the impact of climate change on daily temperatures, as well as NOAA's Applied Climate Information System (ACIS) to find daily temperature information, we have compiled a high-level overview of how climate change has affected temperature trends in January in cities across the U.S.

---

1. High-level findings

- January temperature anomalies in the U.S. were cool across much of the country: **166 out of 191 analyzed cities were cooler than normal**. Cool anomalies stood out from the Rocky Mountains eastward (Figure 1).
- Three states had cities on average more than 7°F cooler than normal: Kansas, Wyoming, and West Virginia. Meanwhile, Alaska stood out as the state with the most anomalously warm cities. The average city in Alaska was 9.7°F warmer than usual.
- Despite this seemingly cold January, **not one city in this analysis set a low temperature record for January.** Only in two cities was this month among the five coldest Januarys on record: Bluefield, WV (fifth coldest) and Parkersburg, WV (fifth coldest).
- The Ohio Valley and the Southeast had particularly cold January temperatures, where cities on average were more than 4.5°F cooler than average.
- Although temperatures were colder than normal across much of the country, the warming influence of climate change was pronounced. Days in which warmer temperatures made at least 2x more likely because of climate change (CSI level 2 or higher) outnumbered days where climate change made cooler temperatures at least 2x more rare (CSI level -2 or lower).

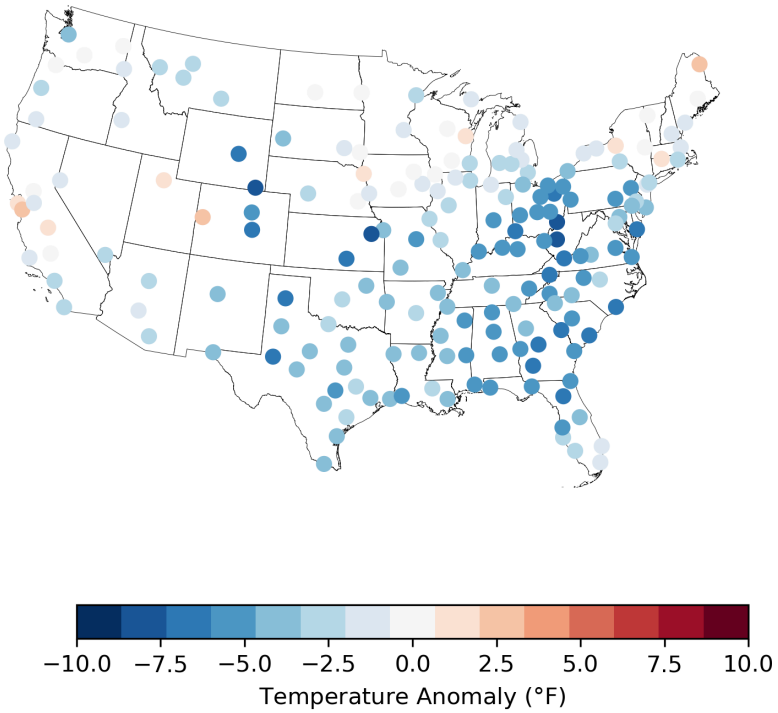

Figure 1. Threaded ACIS temperature anomalies for January 2024 relative to the 1991-2020 standard normal period. Analysis based on ACIS data.

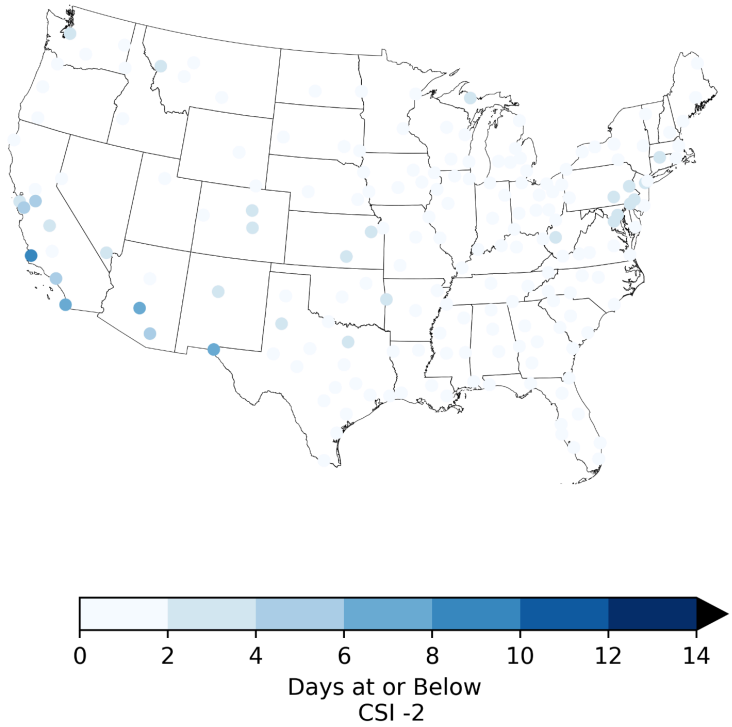

Figure 2. Days with a CSI of -2 or lower for January 2024 for ACIS threaded stations. Analysis based on ERA5 data (January 1-28) and GFS data (January 29-31).

2. Local Temperature Anomaly Analysis

- The most unusually hot city in January was Fairbanks, Alaska where it was 14.6°F hotter than normal. Alaska as a whole had a remarkably warm January: the top three unusually warm cities in January were in Alaska.
- However, most of the country was cooler than normal, with a negative temperature anomaly in 166 out of 191 cities. **The average temperature anomaly across all cities was -2.9°F.** In 46 cities temperatures were more than 5°F cooler than normal.
- **Nonetheless, no city set a record for the coldest January on record.** This is likely because the "normal" temperature we use to calculate anomalies reflects the average temperature from 1991-
  2020, whereas temperature records have been kept for much longer. (For cities in this report, the mean year in which records start is 1892). So January temperatures were cold compared to 1991-2020, but less so compared to older records.
- Although January 2025 was cooler than normal, **189 out of 191 ACIS stations analyzed have positive monthly temperature trends since 1970**. Juneau, Alaska had an unusually warm January (with an average daily temperature anomaly of 4.7°F) and is the fastest-warming ACIS station for January on average, warming 9.6°F on average since 1970.

City	State	Temperature Anomaly (°F)	Average Temperature (°F)	Warming Since 1970 (°F)
Fairbanks	AK	14.57	6.27	4.6
Anchorage	AK	9.88	26.73	5.9
Juneau	AK	4.73	33.18	9.6
Presque Isle	ME	3.13	14.82	7.5
Grand Junction	CO	2.64	30.34	4.2
San Jose	CA	2.48	53.27	3.6
San Juan	PR	2.10	79.65	1.2
Honolulu	HI	1.46	75.11	2.1
Springfield	MA	1.36	28.40	6.1
Hartford	CT	1.36	28.40	6.1

Table 1. Top 10 ACIS stations with the highest January 2024 temperature anomaly.

City	State	Warming Since 1970 (°F)	Temperature Anomaly (°F)	Average Temperature (°F)
Juneau	AK	9.6	4.73	33.18
Bismarck	ND	9.3	0.52	13.32
Minneapolis	MN	9.1	-0.73	15.47
Green Bay	WI	8.9	1.16	19.45
Milwaukee	WI	8.9	-2.71	21.34
Billings	MT	8.8	-2.12	24.82
Duluth	MN	8.8	-2.19	8.95
Great Falls	MT	8.8	-3.07	22.06
Fargo	ND	8.6	0.33	9.53
Waterloo	IA	8.6	0.60	20.05

Table 2. Top 10 ACIS stations with the fastest warming January since 1970.

3. Local Climate Shift Index Analysis

- Climate change-related warming was notable in 5 out of 191 ACIS stations analyzed. Each had at least one week with daily CSI values of 3 or more, indicating that unusually warm temperatures on those days were made at least three times as likely due to climate change.
- San Juan, Puerto Rico had 27 days at CSI 5, indicating that temperatures on those days were made at least 5 times more likely because of climate change.
- Honolulu, Anchorage, and Juneau all stood out for warm Januarys: these cities experienced 23, 19, and 17 days at a CSI of 3 or higher respectively.
- Cooler days across much of the country led to negative CSI levels in some locations, indicating temperatures expected to occur less often in a warming world. The most days with CSI levels of -2 or lower (temperatures made at least 2x less likely because of climate change) occurred in California, the Southwest, and Northeast.
- Although temperatures were colder than normal across much of the country, the average number of days experienced by cities with a CSI at or above 2 was *higher than* the average number of days experienced by cities with a CSI at or below -2. (A CSI level of 2 indicates that temperatures were made at least 2x more likely to occur, while a CSI of -2 indicates that temps were made at least 2x less likely to occur). This is likely because although temperatures across the country were colder compared to today's climate, they were not necessarily colder in comparison to a pre-global warming climate.

City	State	Days at CSI = 3 or higher	Days at CSI = 5	Average Temperature (°F)	Temperature Anomaly (°F)
San Juan	PR	28	27	79.65	2.10
Honolulu	HI	23	21	75.11	1.46
Anchorage	AK	19	17	26.73	9.88
Juneau	AK	17	7	33.18	4.73
San Francisco	CA	7	3	52.53	1.28
San Jose	CA	6	1	53.27	2.48
Eureka	CA	3	1	46.63	-1.32
Minneapolis	MN	2	0	15.47	-0.73
Medford	OR	2	0	38.61	-1.74
Mitchell	SD	2	0	17.97	-0.98
Albuquerque	NM	2	0	33.66	-3.75

Table 3. Top 10 ACIS stations with the highest number of days at or above a CSI of 3 during January 2024.

Methods

Calculating the Climate Shift Index

All Climate Shift Index (CSI) levels reported in this brief are based on daily average temperatures and ERA5 data from January 1 to January 28, 2024, and GFS data from January 29 to January 31, 2024. See the frequently asked questions for details on computing the Climate Shift Index, including a summary of the multi-model approach described in Gilford et al. (2022).

City Analysis

We analyzed 191 Applied Climate Information System (ACIS) stations associated with U.S. cities. For each city, we found the CSI time series from the nearest 0.25° grid cell. We calculated the number of days at CSI levels from -5 to 5. We used ACIS data to find the average monthly temperatures, temperature anomalies, and precipitation information, and to derive average monthly warming trends for each city.