

MDSCO-2025-06

Maryland Climate Bulletin

June 2025

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This publication is available from:
<https://www.atmos.umd.edu/~climate/Bulletin/>



Summary

Statewide averages indicate that June 2025 was warmer and drier than normal (i.e., 1991-2020 averages). Regionally, monthly mean temperatures were between 66 and 78°F, maximum temperatures were in the 76–89°F range, and minimum temperatures were between 56 and 69°F. Monthly total precipitation was in the 2.5–7 inches range.

Maryland Regional Features (Figures 1-6, C1, and D1)

- The mean temperature was warmer than normal in the entire state, particularly over Saint Mary's and southern Calvert counties (3.9 to 4.2°F), parts of Charles, Calvert, Talbot, Dorchester, Wicomico, Somerset, and Worcester counties (3.3 to 3.9°F), and southwestern Garrett County (3.0 to 3.3°F).
- The maximum temperature was colder than normal over all of the state, too, notably over Saint Mary's and southern Calvert counties (4.5 to 5.1°F), parts of Charles, Calvert, Talbot, Dorchester, Wicomico, Somerset, and Worcester counties (3.3 to 4.2°F), and southwestern Garrett County (3.0 to 3.6°F).
- The minimum temperature was also warmer than normal throughout the state, particularly over Somerset, Worcester, and southern Wicomico counties (3.6 to 4.0°F), southwestern Saint Mary's and Charles counties (3.4 to 3.8°F), Washington County, and the area between Garrett and Allegany counties (3.2 to 3.4°F).
- Precipitation was below normal in more than half of the state, largely over the coastal counties around the Chesapeake Bay, and particularly over Caroline, Talbot, Dorchester, and Wicomico counties (1.2 to 1.8 inches deficit). These counties received between 60 to 70% of their climatological precipitation for the month. Precipitation was above normal in several counties, especially in Garrett County (1.2–2.1 inches) and northern Carroll and Baltimore counties (0.9–1.5 inches), which received between 20% and 40% more than their climatological precipitation.
- Drought conditions kept improving by the end of June, as approximately 69% of the state was now drought-free, an increase of 18% with respect to the start of June. The extent of Moderate Drought conditions was reduced to around 12%, impacting only Baltimore and Harford counties. The extent of Abnormally Dry conditions was reduced to 19%, primarily affecting the central and eastern Piedmont, as well as some coastal counties on both sides of the Bay, reflecting the transition of these areas toward improved conditions. Streams and rivers experienced much above-normal streamflow in western Maryland and normal streamflow in the Piedmont and on both sides of the Bay. Still, some streams and rivers on the Piedmont and northern Eastern Shore had below-normal stream flow.

Maryland Climate Divisions (Figures 7-8, B1, and B2)

- All climate divisions were warmer than normal, with Climate Division 3, Lower Southern, being the warmest (3.8°F above). On the other hand, five of the climate



divisions were drier than normal, with Climate Division 2, Central Eastern Shore, being the driest (1.50 inches below); two climate divisions, in contrast, were wetter than normal, with Climate Division 8, Allegheny Plateau, being the wettest (0.99 inches above). It is worth noting that Climate Division 6, North Central, exhibited normal precipitation conditions, as wetter- and drier-than-normal conditions within this area balanced each other out.

- The statewide temperature was warmer than normal (2.7°F) in June 2025 for the fifth month since February. Statewide precipitation was below normal (0.29 inches deficit) in June, following much wetter-than-normal conditions in May and barely drier-than-normal conditions in April.

Extreme daily temperatures, precipitation, and growing degree days (Figures 9-11)

- Statewide maximum and minimum daily temperatures from January 1 to June 30, 2025, indicated that the number of days with extreme temperatures has been larger than normal, and so has the number of warm spells. There has been one more hot day (maximum temperatures larger than 86°F) than normal (14 vs. 13), but a normal number of heat waves (3); the mean temperature of all the hot days was 92.0°F, while the maximum was 99.1°F, which occurred on June 25. There has been one more warm day (maximum temperature larger than 80°F) than normal (33 vs. 32), and one more warm day spell than normal (6 vs. 5); the mean temperature of all the warm days was 86.7°F. There have been six more warm nights (minimum temperature larger than 68°F) than normal (10 vs. 4), and one more warm night spell than normal (2 vs. 1) by the end of June; the mean temperature of all the warm nights was 71.5°F, while the maximum was 75.4°F, which occurred on June 24. Most of these extreme temperatures occurred in June.
- Statewide daily total precipitation from January 1 to June 30 showed 1 less day with extreme precipitation (at least 0.64 inches; the 95th percentile in 1951–2000) than normal (8 vs. 9), with none occurring in June. The number of dry spells (two or more consecutive days with daily precipitation of no more than 0.04 inches) from January 1 to June 30 was also fewer than normal by 3 spells (22 vs. 25), but they had a mean duration longer-than-normal by 1 day (5 vs. 4). There were 3 dry spells in June, two of which lasted the longest (5 days) and started on the 2nd and the 24th.
- The cumulative calendar year (January 1 to June 30) modified growing degree days (base 86/50°F) reached around 1684°FDD by the end of June and have been greater than normal since the second week of March, with a departure above normal of 192°FDD by the end of June. Similarly, growing degree days (base 50°F) reached around 1522°FDD by the end of June and have been above normal since the last week of March, with a



departure from normal of 218°FDD by the end of June. The modified growing degree days in June were very similar to those of last year.

Historical Context (Figure 12, Tables A1 and A2)

- Statewide mean, maximum, and minimum temperatures in June 2025 (74.8, 84.9, 64.7°F) were above their long-term means (1895-2024); the mean and minimum temperatures were among the 5% of their highest values, while the maximum temperature was among the 10% of its highest values on record. The mean, maximum, and minimum temperatures were more than 1°F from their historical record highs of 76.6°F in 1943, 87.7°F in 1925, and 65.9°F in 1943, respectively. Statewide precipitation in June 2025 (3.92 inches) was very close to the long-term mean and far from the record low of 0.93 inches in 1988.
- Statewide mean, maximum, and minimum temperatures indicated that June 2025 was the fourth, tenth, and third warmest June since 1895, respectively. Ten of the counties experienced mean temperatures among the five warmest on record, and five of these counties had maximum temperatures among the five warmest Junes. Twenty-two counties recorded minimum temperatures among the four warmest on record; nineteen of them reached their third-warmest June, while Washington County recorded its second warmest.
- Statewide precipitation showed that June 2025 was the seventy-second driest (or sixty wettest) June since 1895.

Century-Plus Trends, 1895-2025 (Figures 13, 14)

- Statewide mean temperature and cooling degree days in June showed significant trends: a warming trend (1.9°F/century) and an increasing cooling trend (54.0°FDD/century). Statewide precipitation had a minuscule, no significant, wetting trend (0.02 in/century).
- Regionally, mean temperatures in June showed significant warming trends in almost the entire state, except in western Maryland. The largest warming trends were observed over Baltimore City (3.0–3.2°F/century) and the counties of the central Piedmont and Eastern Shore (2.2–2.8°F/century).
- Regionally, June precipitation displayed small areas of significant trends. Significant wetting trends were found over northern Cecil County (above 0.7 in/century), while significant drying trends were found over southwestern Charles County (around –0.6 in/century). The largest non-significant wetting trends were over Harford, Cecil, and Kent counties, while the largest non-significant drying trends were over Washington County.



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1. Introduction

The Maryland Climate Bulletin is issued by the Maryland State Climatologist Office (MDSCO), which resides in the Department of Atmospheric and Oceanic Science at the University of Maryland, College Park. It documents the surface climate conditions observed across the state in a calendar month and is issued in the second week of the following month.

Maryland's geography is challenging, with the Allegheny and Blue Ridge mountains to the west, the Piedmont Plateau in the center, the Chesapeake Bay, and the Atlantic Coastal Plain to the east. The range of physiographic features and the state's eastern placement within the expansive North American continent contribute to a comparatively wide range of climatic conditions.

The bulletin aims to document and characterize monthly surface climate conditions in the state, situating them within the context of regional and continental climate variability and change, to help Marylanders interpret and understand recent climate conditions.

The monthly surface climate conditions for June 2025 are presented via maps of key variables, such as average surface air temperature, maximum surface air temperature, minimum surface air temperature, total precipitation, and their anomalies (i.e., departures from normal); they are complemented by drought conditions for the state, as given by the U.S. Drought Monitor, and streamflow anomalies as given by the U.S. Geological Survey Water Watch in Section 3. Statewide and climate division averages for the month are compared against each other via scatter plots in Section 4. Extreme warm daily maximum and minimum temperatures and precipitation, as well as growing degree days, are presented from the analysis of daily statewide averaged temperatures and precipitation in Section 5. Monthly statewide averages are placed in the context of the historical record via box and whisker plots in Section 6. Century-plus trends in statewide air temperature, cooling degree days, precipitation, and state maps of air temperature and precipitation are presented in Section 7. Ancillary statewide, climate division, and county-level information is provided in tables and plots in Appendices A and B; climatology and variability maps are included in Appendices C and D, along with the percentage of normal precipitation and normalized anomalies for each month.

2. Data & Methods

Surface air temperatures, total precipitation, and degree-days data in this report are from the following sources:

- NOAA Monthly U.S. Climate *Gridded* Dataset at 5-km horizontal resolution (NClimGrid – Vose et al., 2014). It is available in a preliminary status at:
- <https://www.ncei.noaa.gov/data/nclimgrid-monthly/access/>
Data was downloaded on July 9, 2025.



- NOAA Monthly U.S. Climate *Divisional* Dataset (NClimDiv – Vose et al., 2014). It is available in a preliminary status (v1.0.0-20250707) at:
<https://www.ncei.noaa.gov/pub/data/cirs/climdiv/>
Data was downloaded on July 11, 2025.
- NOAA area averages of daily temperatures and precipitation dataset (nClimGrid–Daily –Durre et al., 2022). It is available in a preliminary status, v1.0.0, at:
<https://www.ncei.noaa.gov/products/land-based-station/nclimgrid-daily>
Data labeled as “scaled” was downloaded on July 8, 2025.

Drought conditions are from the U.S. Drought Monitor website:

<https://droughtmonitor.unl.edu/Maps/MapArchive.aspx>

Streamflow conditions are from the U.S. Geological Survey Water Watch website:

<https://waterwatch.usgs.gov/index.php>

Some definitions:

About climate and climatology. Weather and climate are closely related, but they are not the same. Weather represents the state of the atmosphere (temperature, precipitation, etc.) at any given time. On the other hand, climate refers to the time average of the weather elements when the average is over long periods. If the average period is long enough, we can start to characterize the climate of a particular region.

It is customary to follow the World Meteorological Organization (WMO) recommendation and use 30 years for the average. The 30-year averaged weather data is traditionally known as Climate Normal (Kunkel and Court, 1990) and is updated every ten years (WMO, 2017). Establishing a climate normal or climatology is important as it allows one to compare a specific day, month, season, or even another normal period with the current normal. Such comparisons characterize anomalous weather and climate conditions, climate variability and change, and help define extreme weather and climate events (Arguez et al., 2012). The current climate normal, or simply the climatology, is defined for the period 1991–2020.

About the anomalies: Anomalies for a given month (e.g., June 2025) are the departures of the monthly value from the corresponding month’s 30-year average (i.e., from the average of 30 Junes) during 1991-2020. When the observed monthly value exceeds its climatological value, it is referred to as above normal (e.g., warmer than normal or wetter than normal) or a positive anomaly. In contrast, when this value is smaller than its climatological value, it is referred to as below normal (e.g., colder than normal or drier than normal) or negative anomaly.

About variability. The monthly standard deviation of a climate variable measures its dispersion relative to its monthly mean and assesses its year-to-year, or interannual, variability. Anomalies

are sometimes compared against that variability to identify extremes in the climate record. When anomalies are divided by the standard deviation, they are referred to as standardized anomalies.

About hot days, warm days, and warm nights. Extreme heat, detrimental to crops without irrigation and to populations lacking air conditioning, is tracked by the count of hot days, warm days and nights, and their consecutive occurrence (e.g., Tschurr et al. 2020, Barriopedro et al. 2023). A hot day is defined as one when the maximum temperature is greater than 86°F, a warm day is when the maximum temperature is greater than 80°F, while a warm night is when the minimum temperature is greater than 68°F. When these conditions persist for two or more days, they are referred to as heat waves for the hot days and warm spells for the warm days and nights. These threshold values correspond to the 89th and 75th percentiles of statewide daily maximum temperatures and the 95th percentile of statewide daily minimum temperatures for the period 1951- 2000.

About degree days. Degree days represent the difference between the daily mean temperature (calculated by averaging the high and low temperatures) and a predefined base temperature. Since energy demand is cumulative, degree-day totals are typically calculated on a daily, monthly, seasonal, and annual basis.

- *Heating and cooling degree days.* These are used to get a general idea of the amount of energy required to warm or cool buildings. The base temperature used for this purpose is 65°F, which is considered tolerable for human comfort (CPC, 2023).
- *Growing Degree Days.* These are used to estimate the growth and development of plants and insects during the growing season, under the assumption that development will only occur if the temperature exceeds a minimum development threshold temperature, or, in other words, if enough warmth is accumulated. Because actual development varies among different plants and insects, and the presence of weeds and precipitation can influence development, a base temperature of 50°F is generally considered acceptable for all plants and insects (OSU, 2024). However, this base temperature is best suited for the development of specific crops, such as corn, sweet corn, soybeans, tomatoes, and a few others.
 - *Modified Growing degree days.* The modified growing degree days are calculated by establishing base temperatures for the daily maximum and minimum temperatures before determining the daily mean temperature. When the base temperature for the daily maximum temperature is set to 86°F, and the base temperature for the daily minimum temperature is set to 50°F, the growing degree days are specific to corn development, as no appreciable growth is detected with temperatures lower than 50°F or greater than 86°F.

About extreme precipitation. This is defined as the yearly number of days with statewide averaged daily total precipitation equal to or greater than 0.64 inches. This threshold value represents the 95th percentile of statewide averaged daily total precipitation for 1951-2000.

About the dry day spells. A dry day is defined as a day with precipitation below 0.04 inches. These conditions are referred to as dry spells if they persist for two or more consecutive days. The number and duration of dry spells are particularly important during the vegetation period (Tschurr et al., 2020).

About NOAA's Climate Divisions. The term "climate division" refers to one of the eight divisions in the state that represent climatically homogeneous regions, as determined by NOAA: <https://www.ncei.noaa.gov/access/monitoring/dyk/us-climate-divisions>

The eight climate divisions in Maryland are:

- Climate Division 1: Southeastern Shore. It includes the counties of Somerset, Wicomico, and Worcester.
- Climate Division 2: Central Eastern Shore. It includes the counties of Caroline, Dorchester, and Talbot.
- Climate Division 3: Lower Southern. It includes the counties of Calvert, Charles, and St. Mary's.
- Climate Division 4: Upper Southern. It includes the counties of Anne Arundel and Prince George's.
- Climate Division 5: Northeastern Shore. It includes the counties of Kent and Queen Anne's.
- Climate Division 6: North Central. It includes the counties of Baltimore, Carroll, Cecil, Frederick, Harford, Howard, Montgomery, and the city of Baltimore.
- Climate Division 7: Appalachian Mountains. It includes the counties of Allegany and Washington.
- Climate Division 8: Allegheny Plateau. It includes Garrett County.

Note that these Climate Divisions do not correspond with the *Physiographic Provinces* in the state, as the former follow county lines. Climate Division 8 follows the *Appalachian Plateau Province*, Climate Division 7 follows the *Ridge and Valley Province*; however, Climate Division 6 includes the *Blue Ridge and the Piedmont Plateau provinces*, Climate Divisions 3, 4, and a portion of 6 include the *Upper Coastal Plain Province*, and Climate Divisions 1, 2, 5, and a portion of 6 include the *Lower Coastal Plain (or Atlantic Continental Shelf) Province*.

3. June 2025 Maps

A. Mean Temperatures

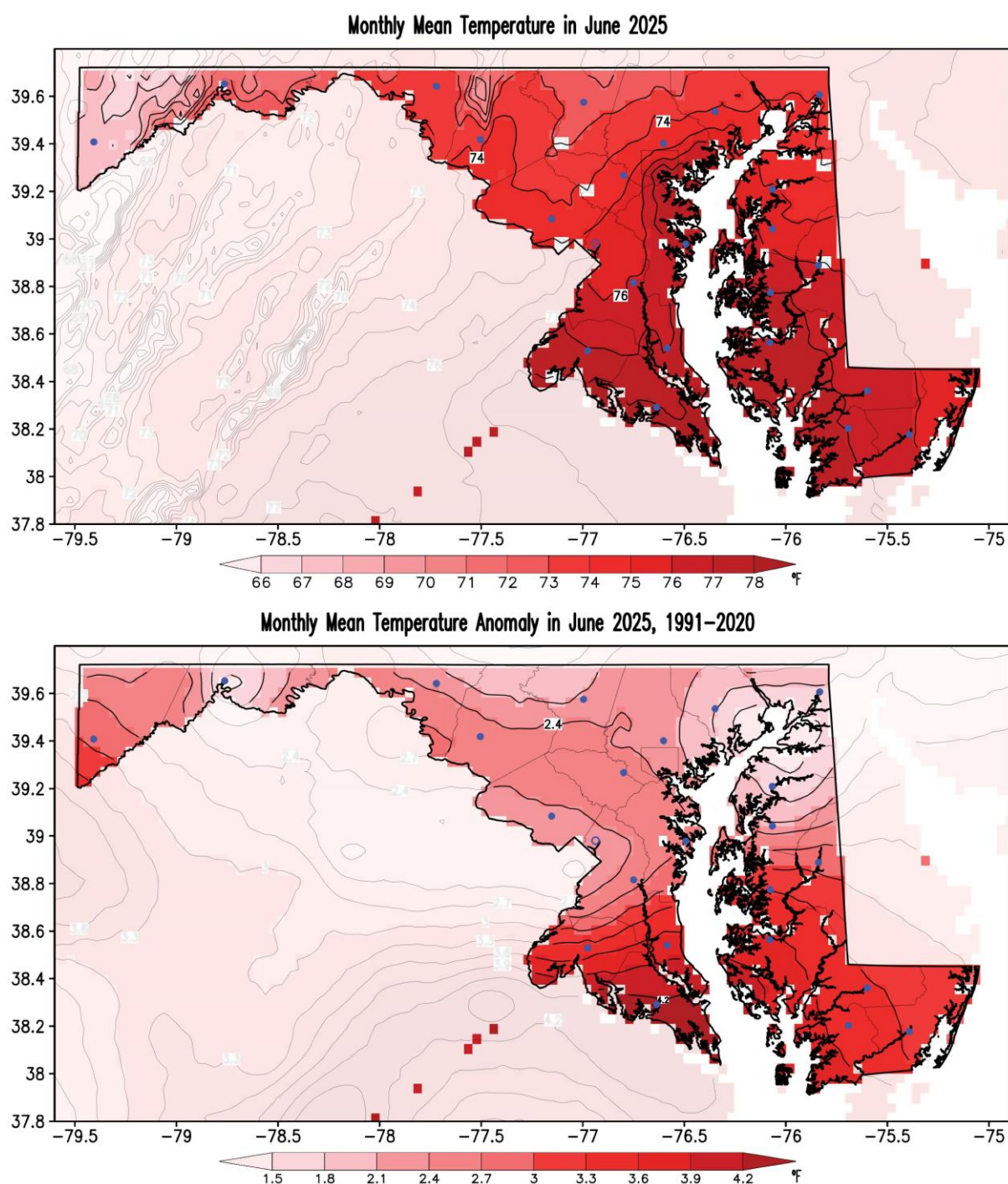


Figure 1. Monthly mean surface air temperature (top panel) and its anomaly with respect to the 1991–2020 climatology (bottom panel) for June 2025. Temperatures are in °F following the color bar. Red shading in the anomaly map marks warmer than normal conditions. Note shading outside the state has been washed out to facilitate focusing on Maryland. Filled blue circles mark the county seats.

B. Maximum Temperatures

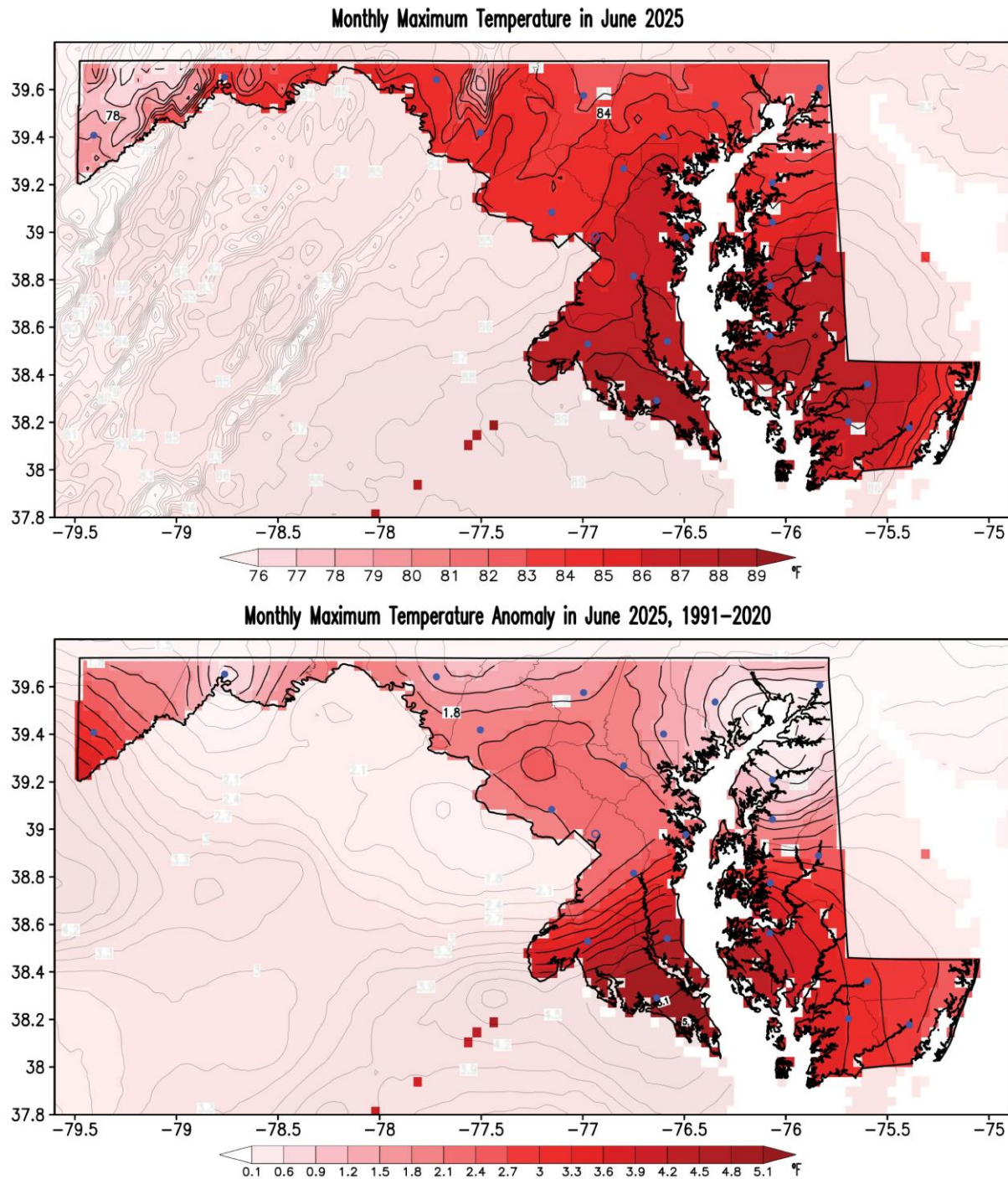


Figure 2. Monthly maximum surface air temperature (top panel) and its anomaly with respect to the 1991-2020 climatology (bottom panel) for June 2025. Temperatures are in °F following the color bar. Red shading in the anomaly map marks warmer than normal conditions. Note shading outside the state has been washed out to facilitate focusing on Maryland. Filled blue circles mark the county seats.

C. Minimum Temperatures

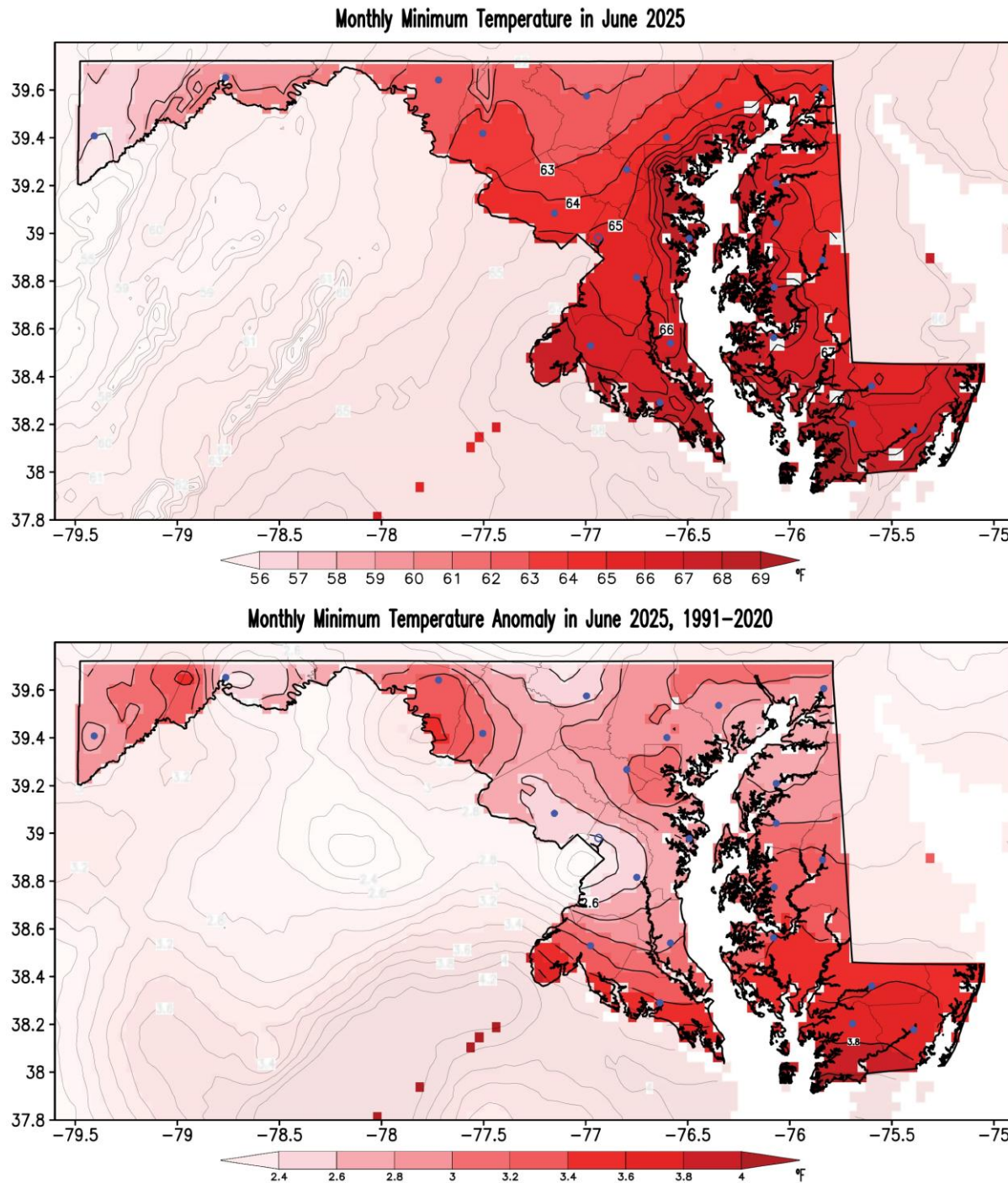


Figure 3. Monthly minimum surface air temperature (top panel) and its anomaly with respect to the 1991–2020 climatology (bottom panel) for June 2025. Temperatures are in °F following the color bar. Red shading in the anomaly map marks warmer than normal conditions. Note shading outside the state has been washed out to facilitate focusing on Maryland. Filled blue circles mark the county seats.

D. Precipitation

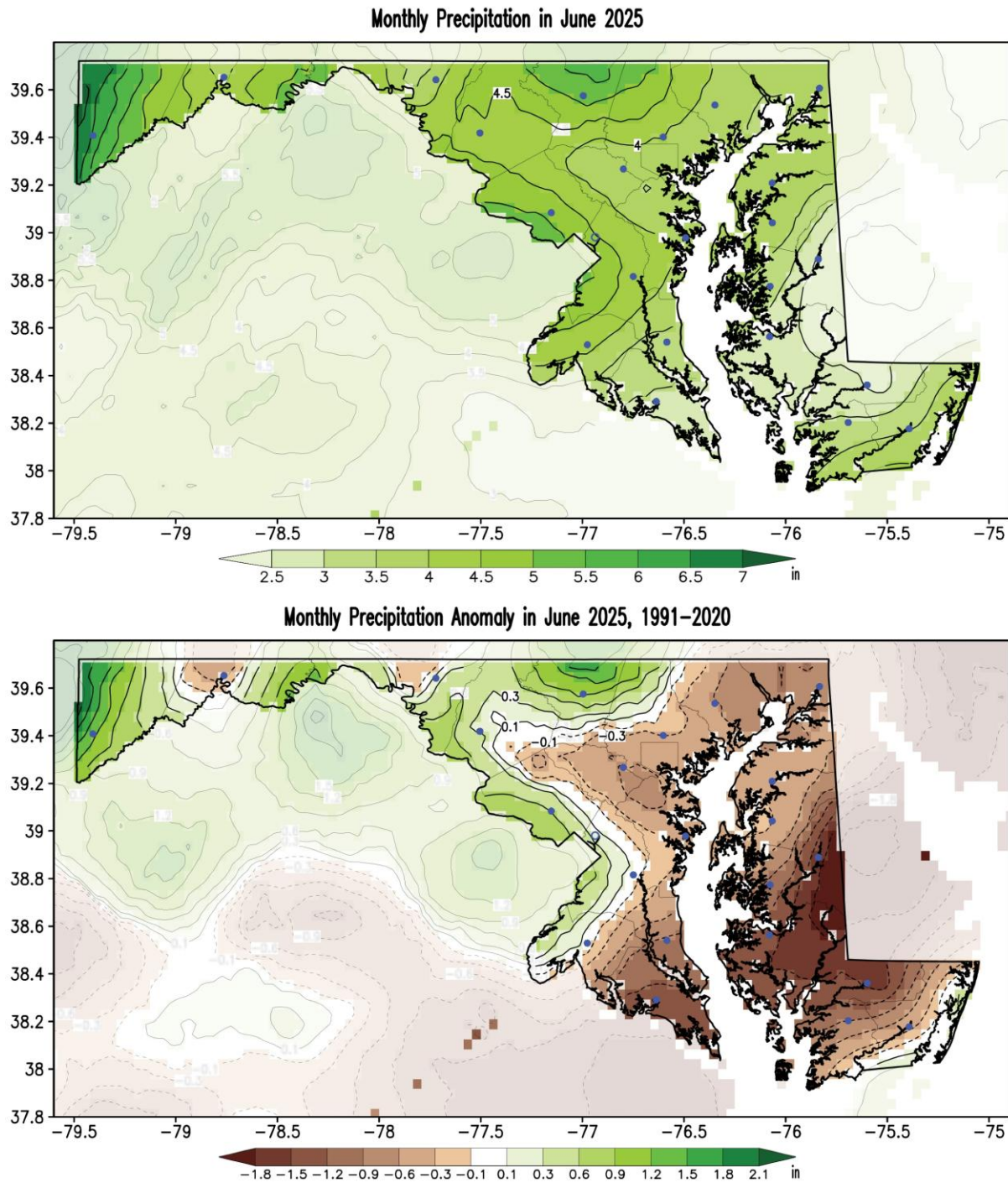


Figure 4. Monthly total precipitation (top panel) and its anomaly with respect to the 1991-2020 climatology (bottom panel) for June 2025. Precipitation is measured in inches, as indicated by the color bar. Brown/green shading in the anomaly map marks drier/wetter than normal conditions. Note shading outside the state has been washed out to facilitate focusing on Maryland. Filled blue circles mark the county seats.

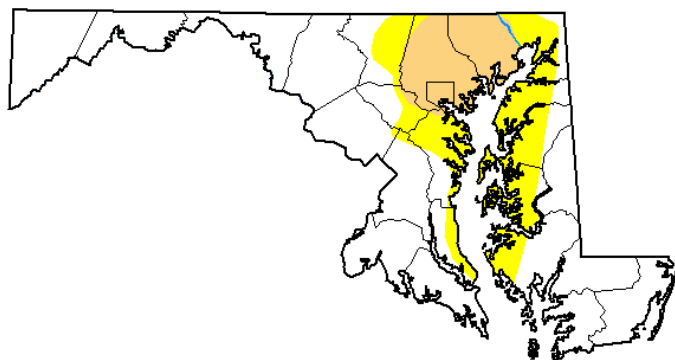
E. Drought

U.S. Drought Monitor Maryland

July 1, 2025

(Released Thursday, Jul. 3, 2025)

Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0	D1	D2	D3	D4
Current	69.02	19.16	11.82	0.00	0.00	0.00
Last Week 06-24-2025	66.40	21.78	11.82	0.00	0.00	0.00
3 Months Ago 04-01-2025	0.00	17.74	23.91	58.35	0.00	0.00
Start of Calendar Year 01-01-2025	1.19	3.51	43.73	51.57	0.00	0.00
Start of Water Year 10-01-2024	18.77	59.58	11.76	5.82	4.07	0.00
One Year Ago 07-02-2024	6.03	41.23	44.95	7.78	0.00	0.00

Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

Curtis Riganti
National Drought Mitigation Center



droughtmonitor.unl.edu

Figure 5. Drought conditions as reported by the U.S. Drought Monitor on July 1, 2025. Conditions have improved for a third consecutive month, as 69% of the state is now drought-free, and the extent of the other drought categories has also decreased at this time. The extent of Moderate Drought conditions was reduced to around 12%, and the extent of Abnormally Dry conditions to 19%, primarily affecting the central and eastern Piedmont, as well as some coastal counties on both sides of the Bay. Yellow shading indicates abnormally dry regions, while light orange shading shows regions under a moderate drought, as indicated by the drought intensity key. Numbers in the table indicate the percentage of the state covered under the particular drought conditions at the time (in the left column). Areas shown in yellow (Abnormally Dry) indicate land that is going into or coming out of drought. Light orange areas (Moderate Drought) highlight land that may experience low water supply and damage to crops and pastures. Current conditions can be monitored on the [U. S. Drought Monitor website](https://droughtmonitor.unl.edu). If interested, you can help monitor drought conditions by submitting a report of your local soil conditions through the National Drought Mitigation Center's Drought Impact Toolkit by using the [Condition Monitoring Observer Reports](#) system.



F. Streamflow

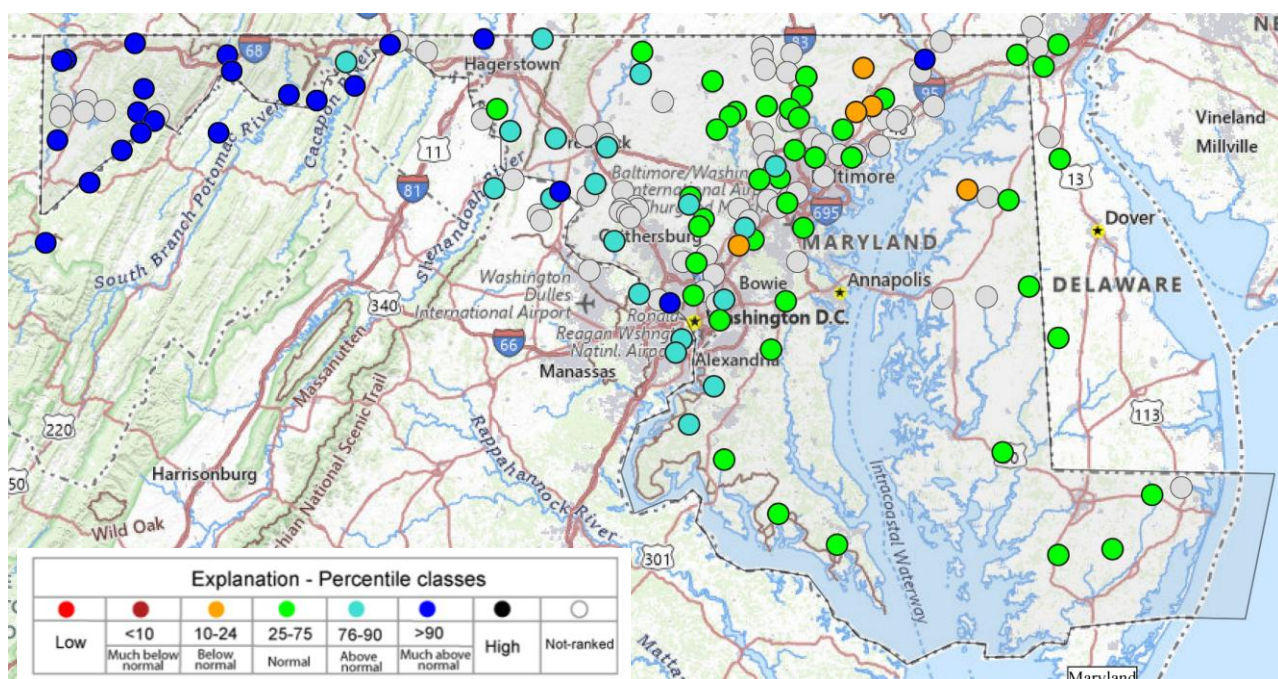


Figure 6. Monthly averaged streamflow class anomalies as reported by the U.S. Geological Survey (USGS) Water Watch for June 2025. Orange-filled circles denote below-normal streamflow conditions, cyan to navy blue-filled circles denote above-normal streamflow conditions, and green-filled circles represent normal streamflow conditions. Streams and rivers in western Maryland experienced much above-normal streamflow. Still, some streams and rivers on the central Piedmont and northern Eastern Shore had below-normal stream flow. Current conditions can be monitored on the [U. S. Geological Survey website](https://waterwatch.usgs.gov/).

4. June and AMJ 2025 Climate Divisions Averages

A. June 2025 Scatter Plots

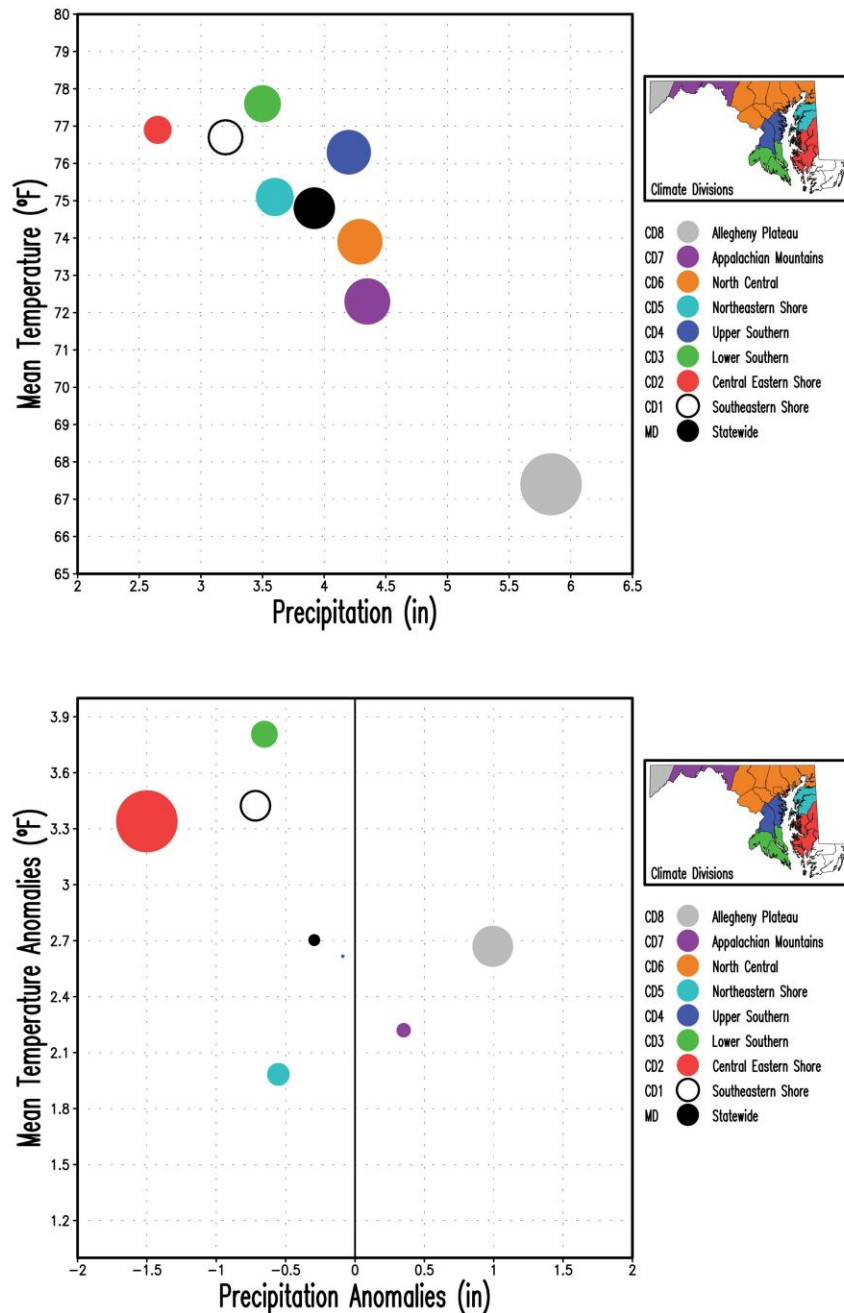


Figure 7. Scatter plots of Maryland (statewide) and Climate Divisions (CD#) monthly mean surface air temperature vs. total precipitation for June 2025. The upper panel displays the mean temperature and total precipitation, while the bottom panel displays their anomalies relative to the 1991-2020 climatology. Temperatures are in °F and precipitation is in inches. The size of the circles is proportional to the total precipitation scaled down by the maximum precipitation (5.84 inches in CD8, top panel) and by the maximum precipitation anomaly $|-1.50|$ inches in CD2, bottom panel) among the nine regions. Note that the color of the filled circles corresponds to the color in the Climate Divisions according to the inset map.

B. April – June 2025 Scatter Plots

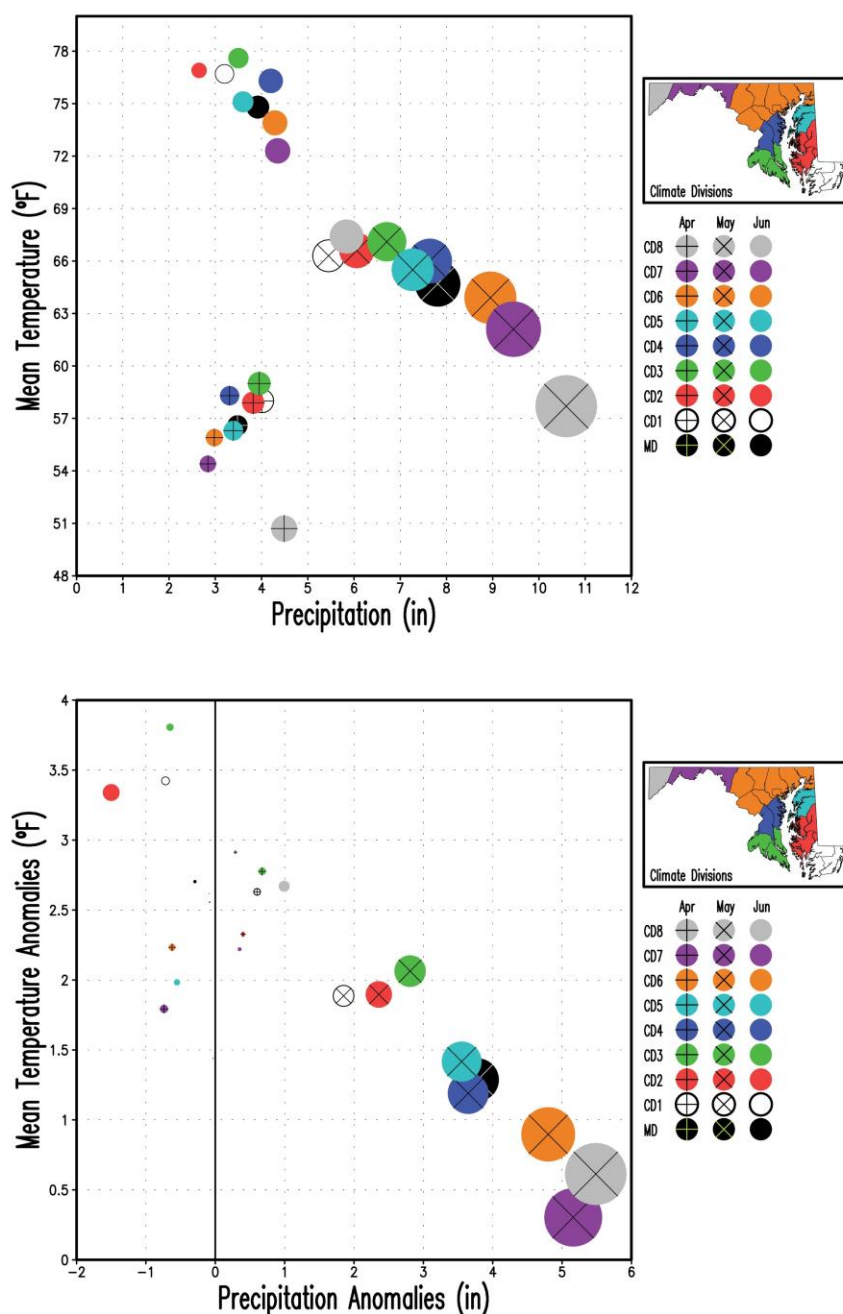


Figure 8. Scatter plots of Maryland (statewide) and Climate Divisions (CD#) monthly mean surface air temperature vs. total precipitation for April, May, and June 2025. The upper panel displays the mean temperature and total precipitation, while the bottom panel shows their anomalies relative to the 1991-2020 climatology. Temperatures are in °F, and precipitation is in inches. The size of the circles is proportional to the total precipitation scaled down by the maximum precipitation (10.59 inches in CD8 in May, top panel) and by the maximum precipitation anomaly (5.49 inches in CD8 in May, bottom panel) among the nine regions and three months. June is displayed with filled circles only, while May and April are displayed with superposed multiplication and addition signs, respectively.

5. Extremes & Growing Degree Days

A. Hot Days, Warm Days, and Warm Nights

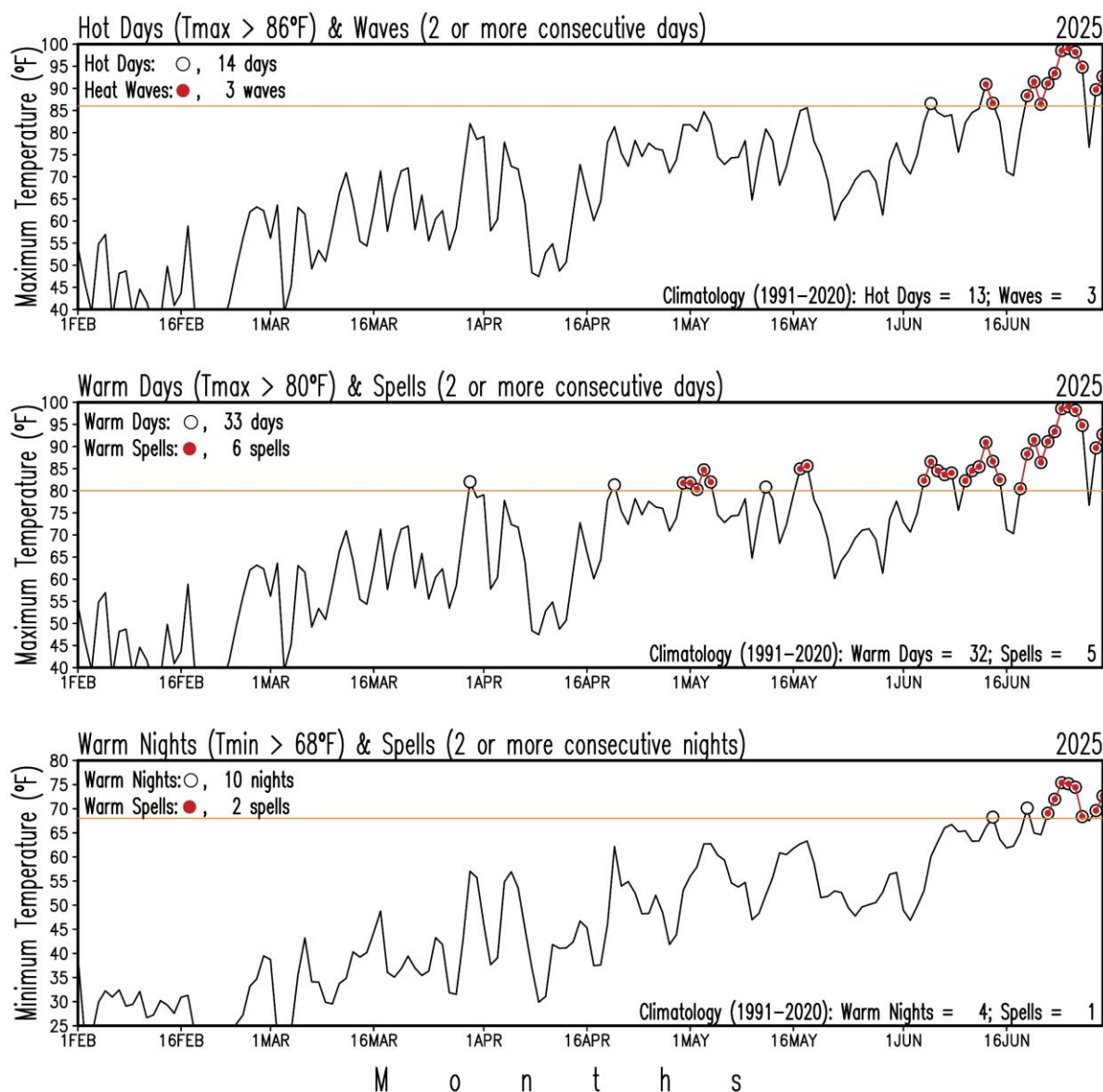


Figure 9. Maryland (statewide) number of hot days, warm days, warm nights, and their consecutive occurrence for the period January 1 – June 30, 2025. The upper panel displays hot days in open circles and heat waves in red-filled circles from statewide daily maximum temperatures. The middle panel shows warm days in open circles and warm day spells in red-filled circles from statewide daily maximum temperatures. The bottom panel displays warm nights in open circles and warm night spells in red-filled circles from statewide daily minimum temperatures. The orange line in each panel marks the threshold temperatures of 86°F, 80°F, and 68°F for each case. Figures at the county and climate division levels, as well as summary tables, are available on the [MDSCO website](https://www.maryland.gov/MDSCO/).

B. Extreme Precipitation and Dry Spells

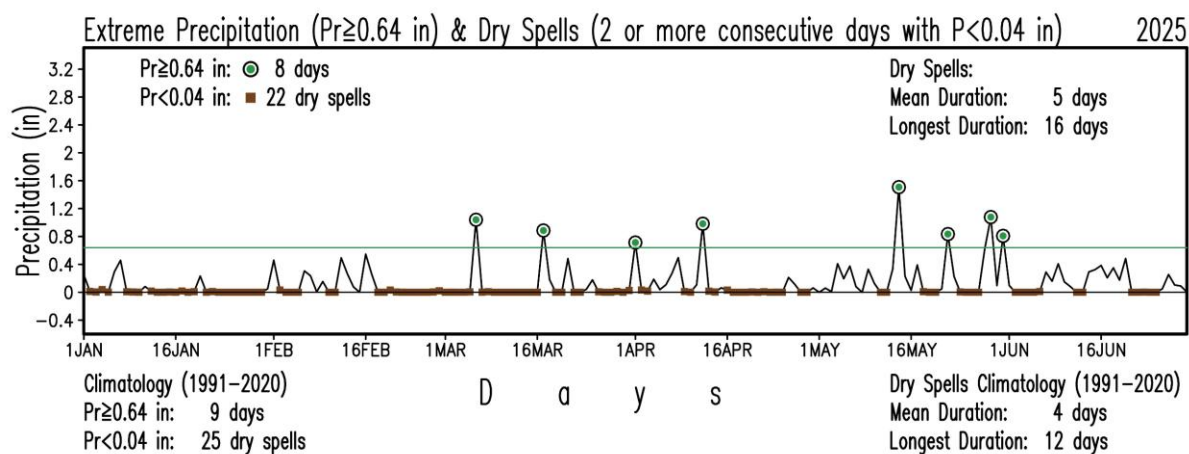


Figure 10. Maryland (statewide) number of days with extreme precipitation and dry day spells for the period January 1 – June 30, 2025. Extreme precipitation days (precipitation equal to or larger than 0.64 in) are identified by green-filled circles. Dry spells (consecutive days with daily total precipitation less than 0.04 in) are shown by brown-filled squares. Both extremes are identified from the statewide total daily precipitation. Figures at the county and climate division levels, as well as summary tables, are available on the [MDSCO website](#).

C. Growing Degree Days

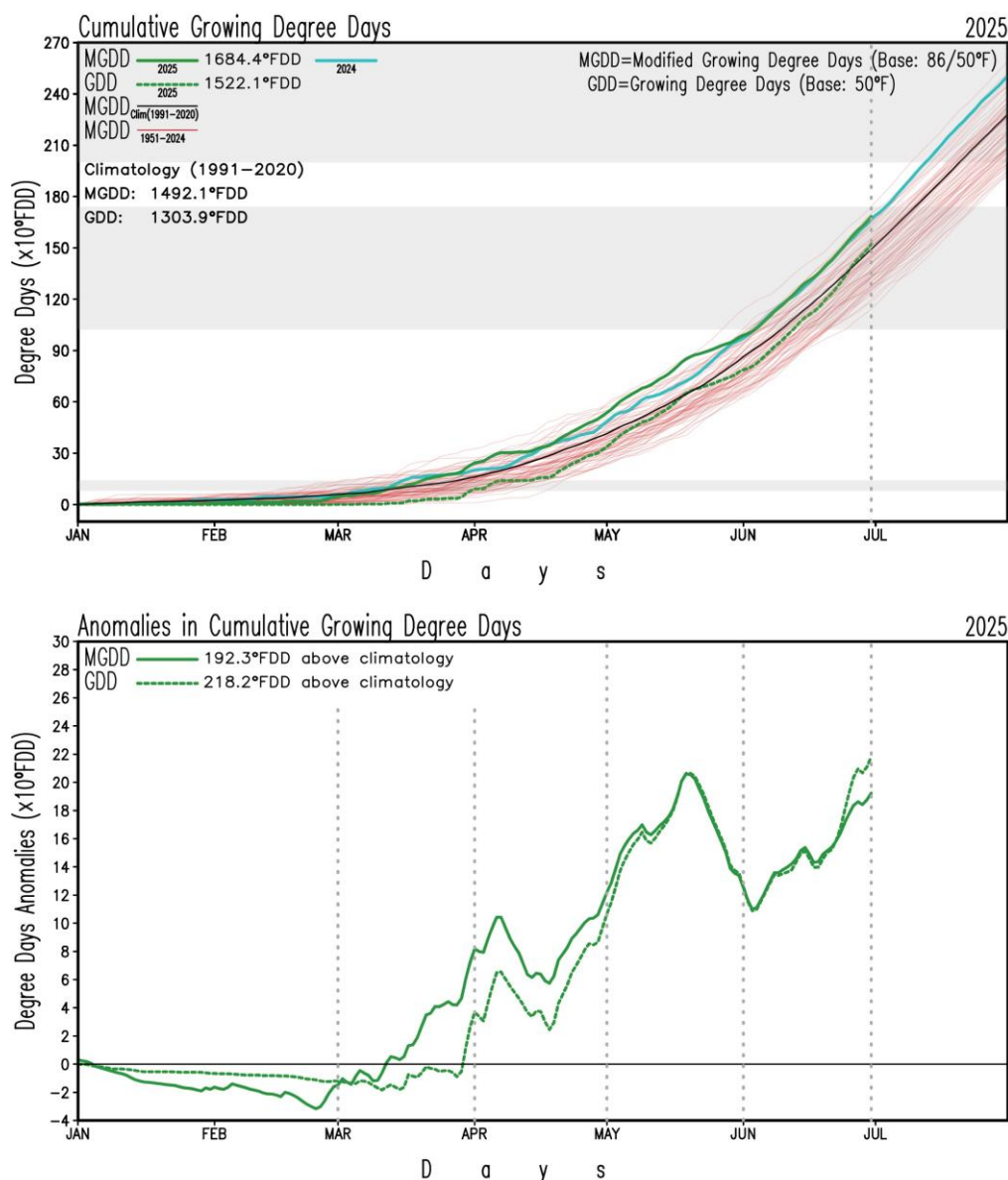


Figure 11. Maryland (statewide) cumulative growing degree days (upper panel) and its anomaly with respect to the 1991-2020 climatology (lower panel) for the period January 1 - June 30, 2025. The growing degree days are displayed with the dashed green line, while the modified growing degree days are shown with the continuous green line in the upper panel; for reference the modified growing degree days for 2024 are displayed with the continuous cyan line; the black line shows the 1991-2020 climatology of the cumulative modified growing degree days; the thin red lines display the cumulative modified growing degree days every year from 1951 to 2023. The gray shaded areas mark a range of values for emergence (82-140), tassle-silk (1024-1740), and physiological maturity (2000-3350) in corn development (IPAD, 2023). Anomalies with respect to the 1991-2020 climatology in the cumulative modified growing degree days (bottom panel) are displayed with the continuous green line, while those for the cumulative growing degree days are shown with the dashed green line. The vertical dotted gray lines mark the start of the months since March. The accumulated growing degree days and their anomalies as of June 30 are displayed at the top left of each panel. Analysis is from statewide daily maximum and minimum temperatures. Figures at the county and climate division levels, as well as summary tables, are available on the [MDSCO website](https://www.mdsco.org/).

6. June 2025 Statewide Averages in the Historical Record

A. Box and Whisker Plots

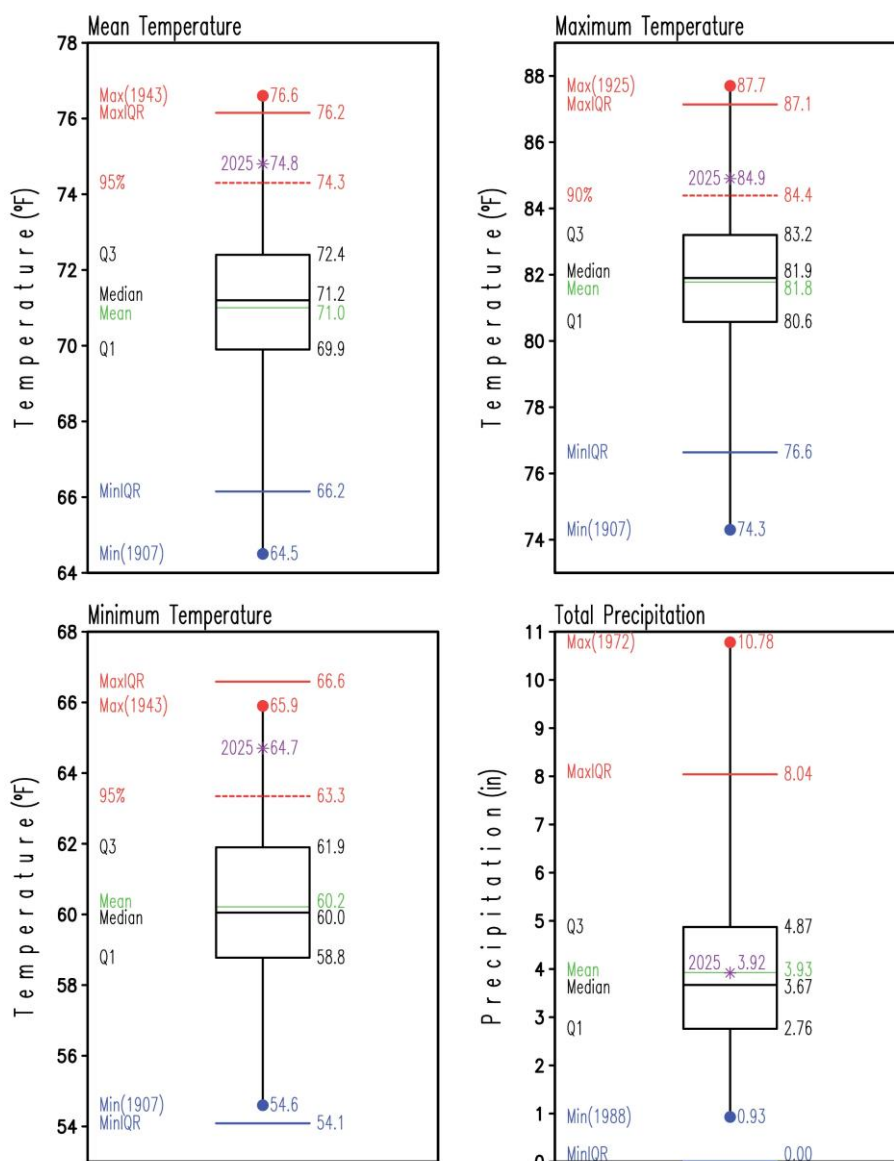


Figure 12. Box and Whisker plots of Maryland (statewide) monthly mean (upper left), maximum (upper right), minimum (lower left) surface air temperatures, and total precipitation (lower right) for June for the period 1895-2024. The label and asterisk in purple represent conditions for June 2025. Statistics for the period 1895-2024 are labeled at the left side of each box and whisker plot and their values at their right. Temperatures are in °F, and precipitation is in inches. The mean is the green line within the box, while the median is the black line within the box. The lower (Q1) and upper (Q3) quartiles, indicating the values of the variable that separate 25% of the smallest and largest values, are the lower and upper horizontal black lines of the box, respectively. For reference, the 95th percentile in mean and minimum temperatures and the 90th percentile for maximum temperature are displayed with a red dashed line. The blue and red dots mark the minimum and maximum values in the period at the end of the whiskers; the year of occurrence is shown in parenthesis. The blue and red horizontal lines represent extreme values defined by $Q1 - 1.5 \times (Q3 - Q1)$ and $Q3 + 1.5 \times (Q3 - Q1)$, respectively.

7. 1895-2025 June Trends

A. Mean Temperature, Cooling Degree-Days, and Precipitation

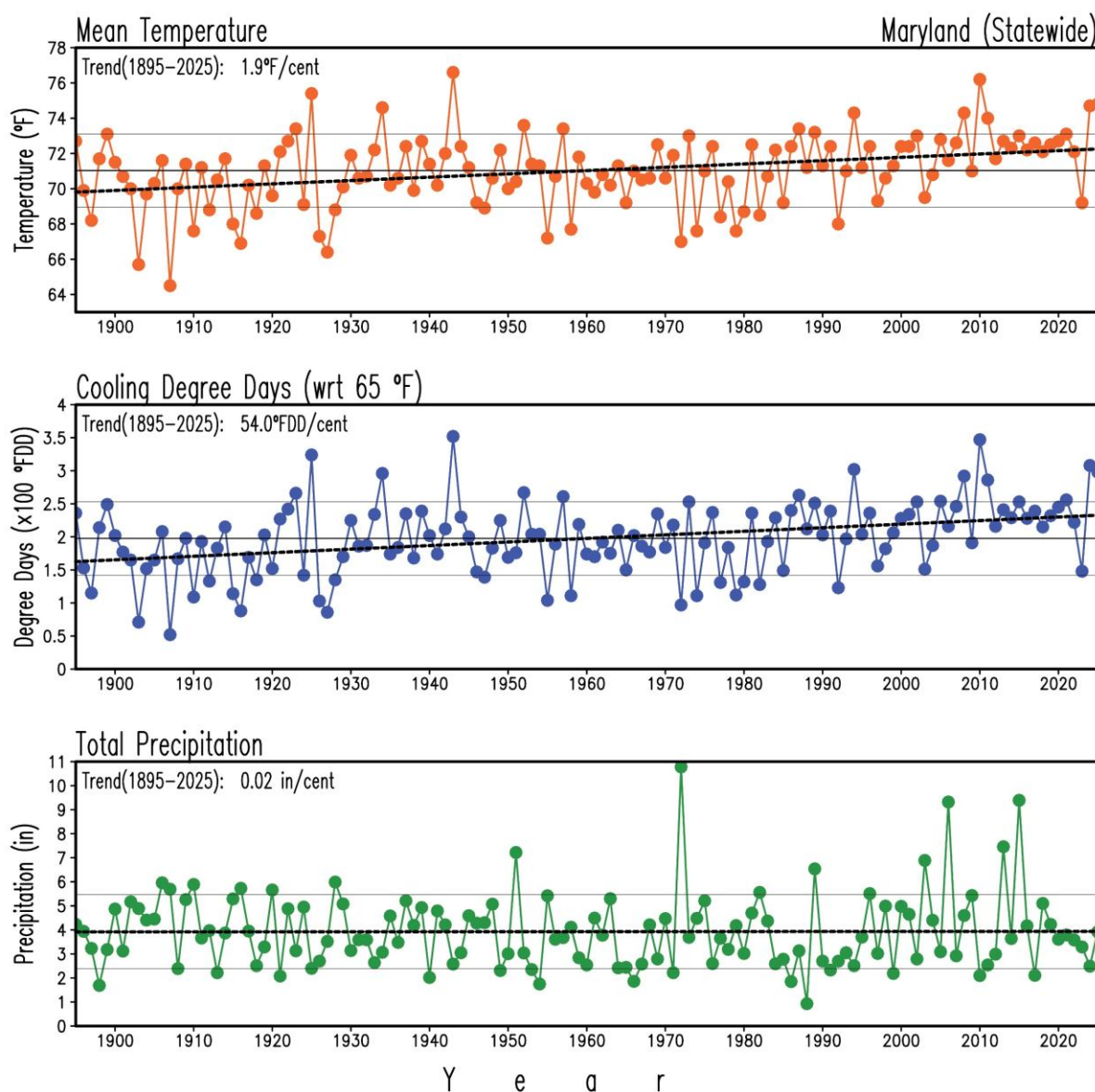


Figure 13. Maryland (statewide) mean surface air temperature, cooling degree days, and precipitation in June for the period 1895-2025. Temperature is in °F, degree-days are in °F degree-days (°FDD), and precipitation is in inches. The thin, continuous black lines in each panel display the long-term means (71.0°F, 197.7°FDD and 3.93 in, 1895-2025), and the double thin, continuous gray lines indicate the standard deviation (2.1°F, 55.5°FDD and 1.55 in) above/below the long-term mean. The thick dashed black lines show the long-term linear trend. The warming temperature trend (1.9°F/century), and the increasing cooling degree-days trend (54.0°FDD/century) are statistically significant at the 95% level (*Student's t-test* –Santer et al. 2000), but not the minuscule precipitation wetting trend (0.02 in/century) .

B. Temperature and Precipitation Maps

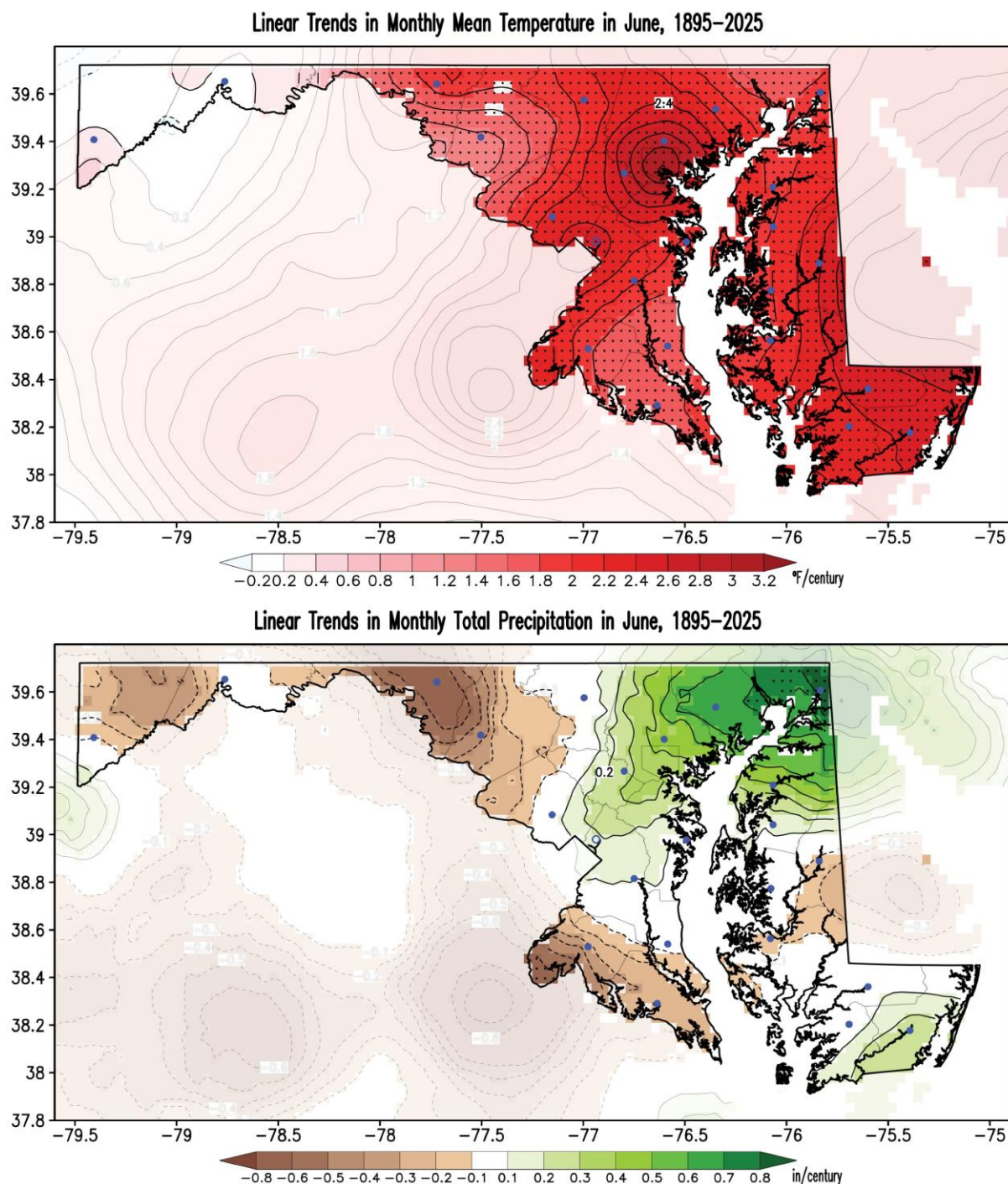


Figure 14. Linear trends in surface air mean temperature and precipitation in June for the period 1895–2025. Temperatures are in °F/century, and precipitation is in inches/century following the color bars. Blue/red shading in the temperature map marks cooling/warming trends. Brown/green shading in the precipitation map shows drying/wetting trends. Stippling in the maps indicates regions where trends are statistically significant at the 95% level (*Student's t-test* – Santer et al. 2000). Note that shading outside the state has been washed out to facilitate focusing on Maryland. Filled blue circles mark the county seats.

Appendix A. June 2025 Data Tables: Statewide, Climate Divisions, and Counties

A. Mean Temperature and Precipitation

Region	Mean Air Temperature (°F)	Rank (#)	Region	Total Precipitation (in)	Rank (#)
Statewide	74.8	128	Statewide	3.92	72
Climate Division 1	76.7	129	Climate Division 1	3.20	58
Climate Division 2	76.9	128	Climate Division 2	2.65	38
Climate Division 3	77.6	129	Climate Division 3	3.50	62
Climate Division 4	76.3	127	Climate Division 4	4.20	84
Climate Division 5	75.1	123	Climate Division 5	3.60	71
Climate Division 6	73.9	124	Climate Division 6	4.29	83
Climate Division 7	72.3	124	Climate Division 7	4.35	89
Climate Division 8	67.4	126	Climate Division 8	5.84	105
Allegany	71.3	119	Allegany	4.54	97
Anne Arundel	76.6	127	Anne Arundel	3.87	78
Baltimore	74.3	125	Baltimore	4.26	81
Baltimore City	76.4	125	Baltimore City	3.76	70
Calvert	77.2	128	Calvert	3.37	58
Caroline	76.0	128	Caroline	2.48	31
Carroll	72.8	125	Carroll	4.89	94
Cecil	73.8	122	Cecil	3.64	60
Charles	77.4	128	Charles	3.97	77
Dorchester	77.4	128	Dorchester	2.66	37
Fredrick	73.4	125	Fredrick	4.49	85
Garrett	67.4	126	Garrett	5.83	105
Harford	74.1	123	Harford	3.81	63
Howard	74.2	126	Howard	3.89	74
Kent	74.9	122	Kent	3.69	71
Montgomery	74.3	126	Montgomery	4.68	92
Prince George's	76.0	126	Prince George's	4.41	86
Queen Anne's	75.4	124	Queen Anne's	3.63	74
Saint Mary's	78.0	129	Saint Mary's	2.97	41
Somerset	77.4	129	Somerset	3.30	59
Talbot	77.0	128	Talbot	3.17	57
Washington	73.3	126	Washington	4.17	82
Wicomico	76.7	128	Wicomico	2.64	37
Worcester	76.0	128	Worcester	3.52	68

Table A1. Monthly mean surface air temperature (left) and total precipitation (right) at Maryland (statewide), climate division, and county levels for June 2025. Temperatures are in °F, and precipitation is in inches. The rank is the order in which the variable for June 2025 is positioned among the 131 Junes, after the 131 values have been arranged from the lowest to the highest in the *standard competition ranking method*. The closer to 131 the rank is, the larger (i.e., the warmer/wetter) the value of the surface variable is in the record; similarly, the closer to 1 the rank is, the smaller (i.e., the colder/drier) the value of the surface variable is in the record.

B. Maximum and Minimum Temperatures

Region	Maximum Air Temperature (°F)	Rank (#)	Region	Minimum Air Temperature (°F)	Rank (#)
Statewide	84.9	122	Statewide	64.7	129
Climate Division 1	86.1	127	Climate Division 1	67.2	129
Climate Division 2	87.3	127	Climate Division 2	66.6	129
Climate Division 3	88.0	128	Climate Division 3	67.2	129
Climate Division 4	86.2	121	Climate Division 4	66.2	129
Climate Division 5	84.4	104	Climate Division 5	65.8	129
Climate Division 6	83.9	114	Climate Division 6	63.8	129
Climate Division 7	83.6	102	Climate Division 7	61.0	129
Climate Division 8	78.0	109	Climate Division 8	56.8	129
Allegany	82.8	88	Allegany	59.8	126
Anne Arundel	86.3	121	Anne Arundel	66.9	129
Baltimore	84.4	115	Baltimore	64.1	129
Baltimore City	86.0	119	Baltimore City	66.7	129
Calvert	87.6	128	Calvert	66.9	129
Caroline	86.7	125	Caroline	65.4	129
Carroll	83.4	115	Carroll	62.2	128
Cecil	82.6	93	Cecil	65.1	129
Charles	87.8	126	Charles	67.1	129
Dorchester	87.8	128	Dorchester	67.1	129
Fredrick	83.8	113	Fredrick	62.9	129
Garrett	78.0	109	Garrett	56.8	129
Harford	83.4	98	Harford	64.7	128
Howard	84.7	121	Howard	63.7	129
Kent	83.7	98	Kent	66.1	129
Montgomery	84.4	118	Montgomery	64.2	129
Prince George's	86.4	121	Prince George's	65.6	129
Queen Anne's	84.8	110	Queen Anne's	65.9	129
Saint Mary's	88.4	129	Saint Mary's	67.6	129
Somerset	86.6	127	Somerset	68.2	129
Talbot	86.9	128	Talbot	67.1	129
Washington	84.3	112	Washington	62.3	130
Wicomico	87.0	126	Wicomico	66.4	129
Worcester	85.1	126	Worcester	67.0	129

Table A2. Monthly maximum (left) and minimum (right) surface air temperatures at Maryland (statewide), climate division, and county levels for June 2025. Temperatures are in °F. The rank is the order in which the variable for June 2025 is positioned among the 131 Junes, after the 131 values have been arranged from lowest to highest using the *standard competition ranking method*. The closer to 131 the rank is, the larger (i.e., the warmer) the value of the surface variable is in the record; similarly, the closer to 1 the rank is, the smaller (i.e., the colder) the value of the surface variable is in the record.

Appendix B. June 2025 Bar Graphs: Statewide, Climate Divisions, and Counties

A. Temperatures and Precipitation

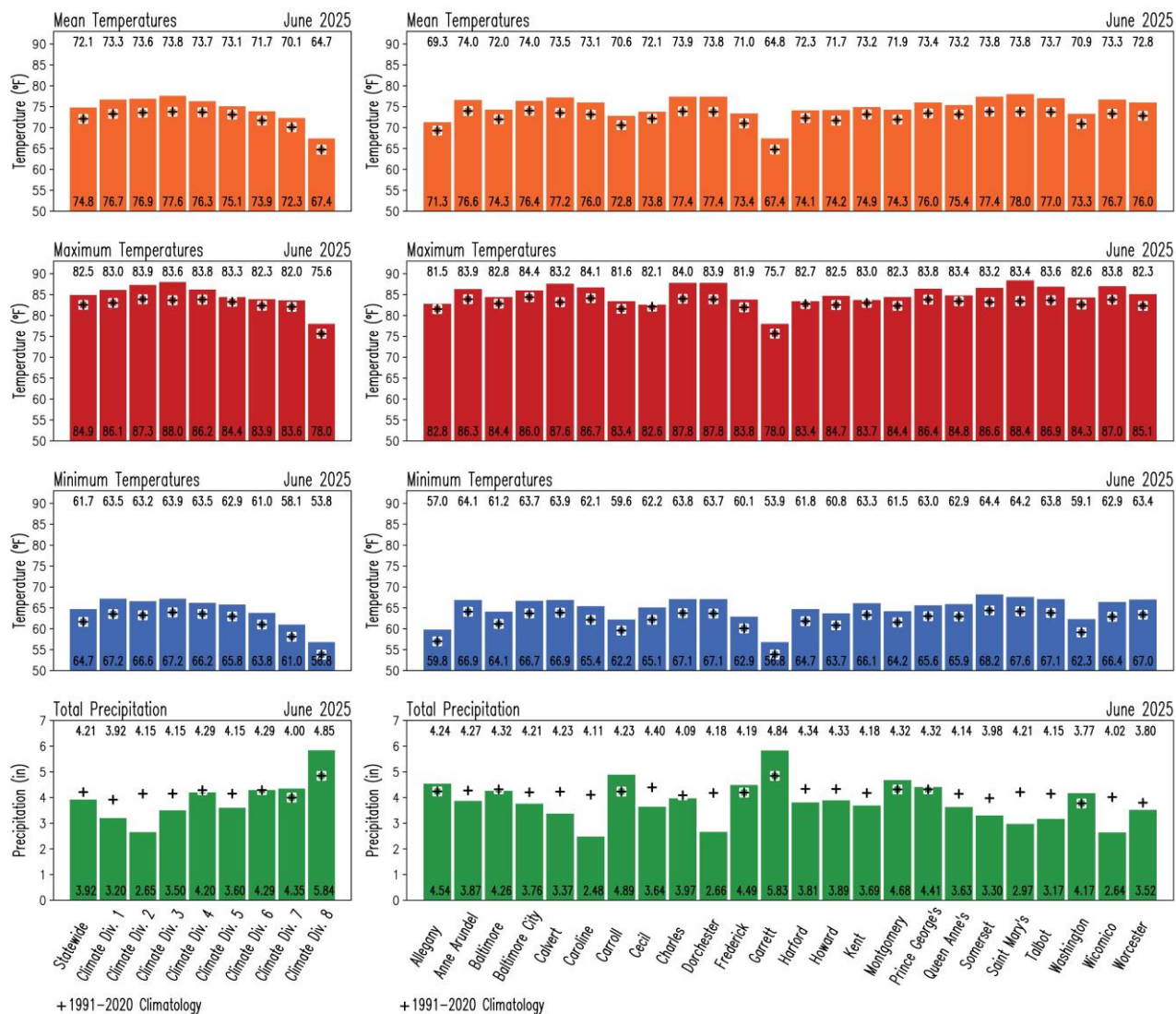


Figure B1. Monthly surface variables for Maryland in June 2025. Color bars represent the variables as follows: mean surface air temperature (orange), maximum surface air temperature (red), minimum surface air temperature (blue), and total precipitation (green) at statewide and climate division (left column), and county (right column) levels. Temperatures are in °F, and precipitation is in inches. The numbers at the base of the bars indicate the magnitude of the variable for June 2025. For comparison, the corresponding 1991-2020 climatological values for June are displayed as black addition signs, and their magnitudes are shown at the top of the panels.

B. Temperatures and Precipitation Anomalies

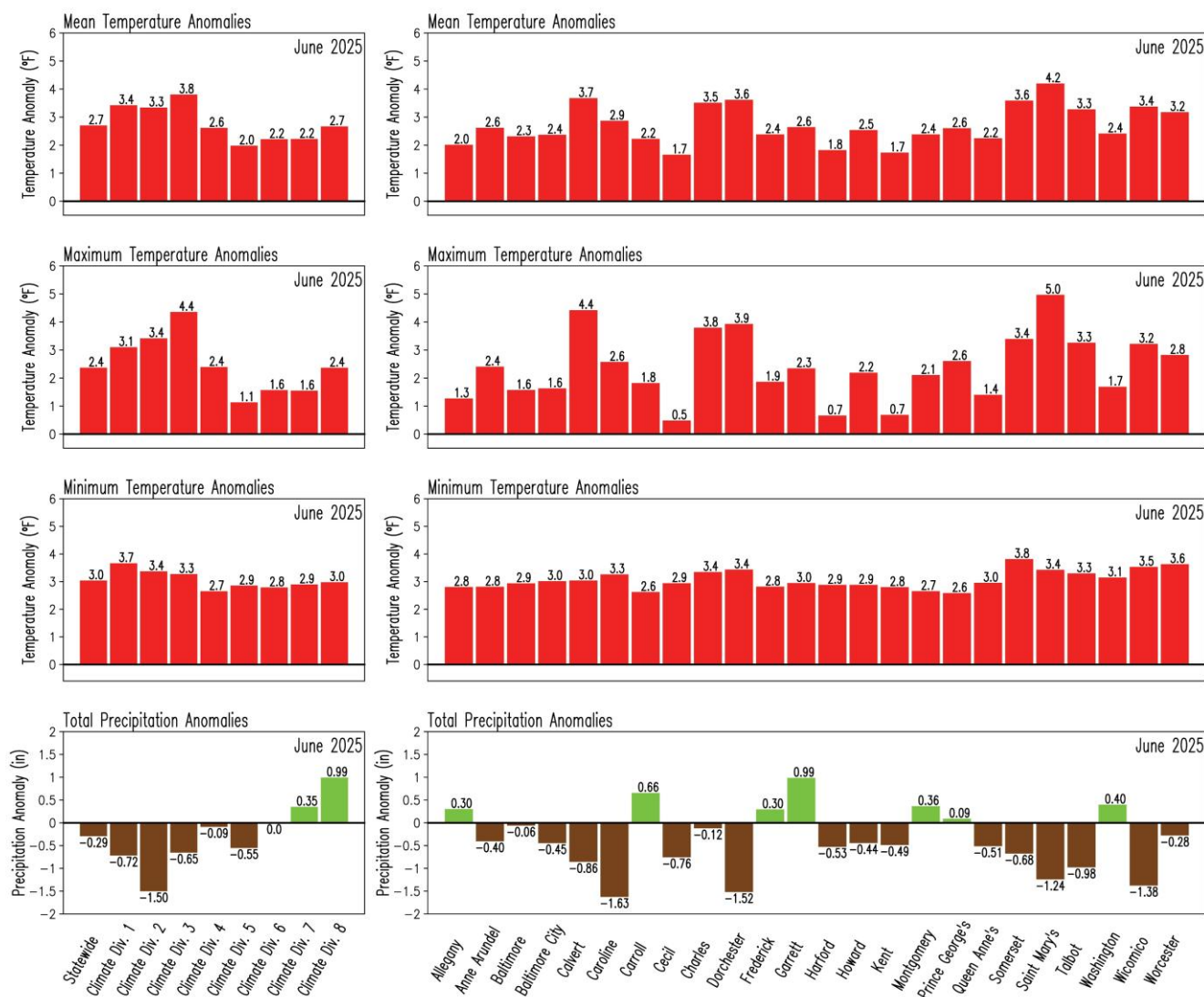


Figure B2. Anomalies in the monthly surface variables for Maryland in June 2025. Anomalies are with respect to the 1991-2020 climatology. Red color represents positive (warmer than normal) anomalies for mean surface air temperature (upper row), maximum surface air temperature (second row from top), and minimum surface air temperature (third row from top), while green/brown color indicates positive/negative (wetter/drier than normal) anomalies in total precipitation (bottom row) at statewide and climate division (left column) and county (right column) levels. Temperatures are in °F, and precipitation is in inches. The numbers outside the bars indicate the magnitude of the anomaly for June 2025.

Appendix C. June 1991-2020 Climatology Maps and June 2025 Precipitation as Percentage of Climatology

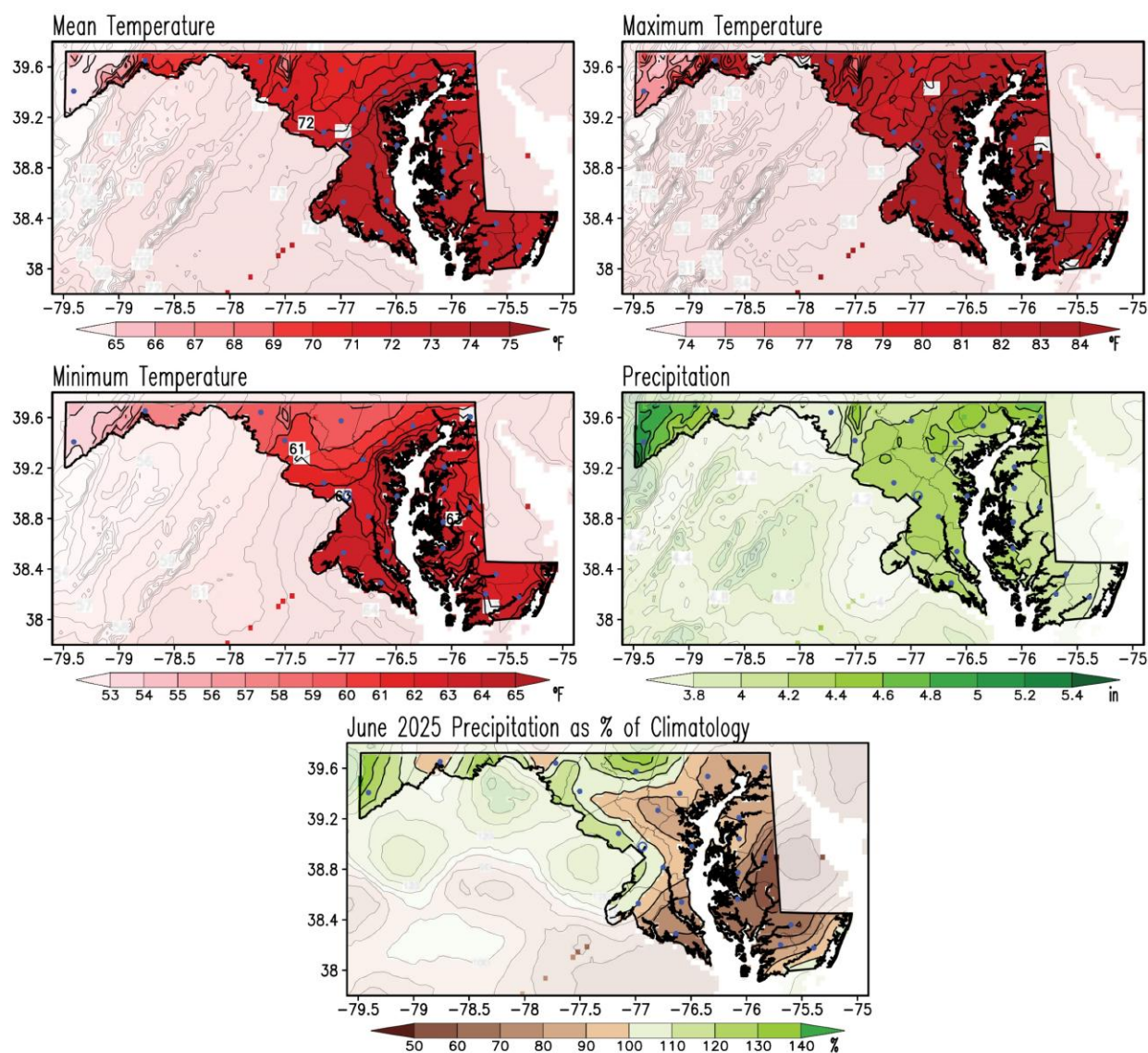


Figure C1. June climatology of the monthly mean, maximum, and minimum surface air temperatures, and total precipitation for the period 1991-2020 (upper and middle rows), and precipitation in June 2025 as a percentage of climatology (bottom row). Temperatures are in °F, and precipitation is in inches according to the color bars. This is the current climate normal against which the June 2025 conditions are compared to obtain the June 2025 anomalies (from Figures 1 to 4). Precipitation as a percentage is calculated by dividing the total precipitation (from Figure 4) by the climatology (from the middle right panel) and multiplying that ratio by 100, so the units are expressed as a percentage of the climatology (%); the brown/green shading in this map indicates drier/wetter than normal conditions. Note that shading outside the state has been washed out to facilitate focusing on Maryland. Filled blue circles mark the county seats.

Appendix D. June Standard Deviation and June 2025 Standardized Anomalies Maps

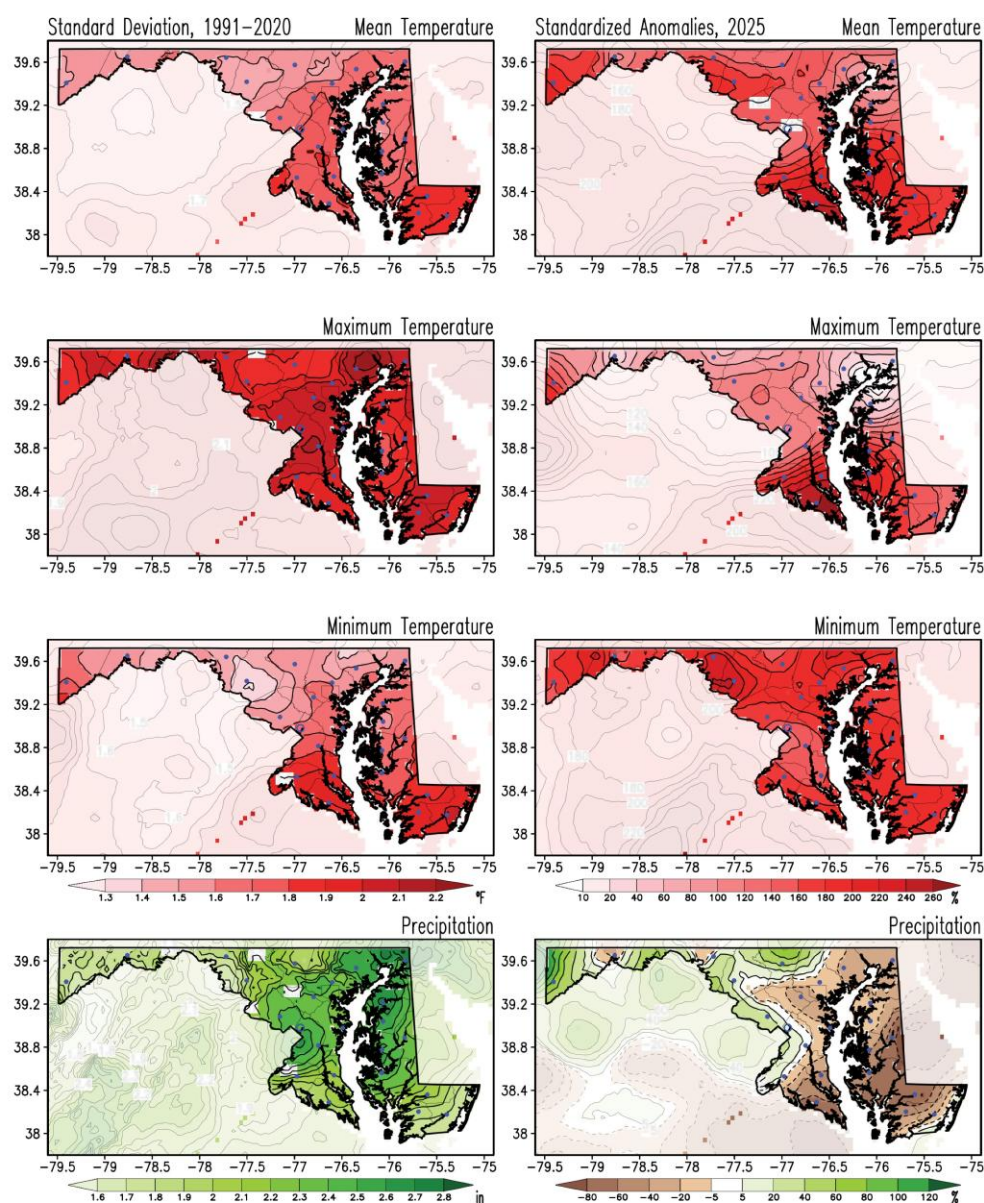


Figure D1. Standard deviation for June and standardized anomalies of temperatures and precipitation for June 2025. Standard deviations for monthly mean, maximum, and minimum surface air temperatures and total precipitation were obtained from the 1991-2020 period (left column). Anomalies for June 2025 (right column) are obtained as a percentage of the standard deviations. The standard deviations in temperatures are in °F, and those in precipitation are in inches according to the color bars. Red shading in the anomaly temperature maps marks warmer than normal conditions; brown/green shading in the anomaly precipitation map marks drier/wetter than normal conditions. The standardized anomalies are obtained by dividing the raw anomalies (from Figures 1 to 4) by the standard deviation (from left column panels) and multiplying that ratio by 100; hence, units are in percent (%). Note that shading outside the state has been washed out to facilitate focusing on Maryland. Filled blue circles mark the county seats.

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