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Maryland Climate Bulletin
June 2026

Prepared by
Dr. Alfredo Ruiz-Barradas
Maryland State Climatologist

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DEPARTMENT OF ATMOSPHERIC & OCEANIC SCIENCE
Sumant Nigam, Chair

Maryland State Climatologist Office

Summary

Statewide averages indicate that June 2026 was warmer and drier than normal (i.e., 1991-2020 averages). Regionally, monthly mean temperatures were between 65 and 76°F, maximum temperatures were in the 75−87°F range, and minimum temperatures were between 53 and 66°F. Monthly total precipitation was in the 1.8−5.1 inches range.

Maryland Regional Features (Figures 1-5, C1, and D1)

- The mean temperature was warmer than normal across the state, particularly in eastern Kent, Queen Anne's, and Caroline counties (1.8−2.4°F), and western areas of Montgomery, Prince George's, and Charles counties (1.8°F). Close-to-normal conditions prevailed over central Washington County.

- The maximum temperature was warmer than normal in the majority of the state, notably in the Eastern Shore over Kent, Queen Anne's, Caroline, Dorchester, and Wicomico counties (3.0−3.6°F), and Talbot, Somerset, Worcester, Prince George's, Anne Arundel, Calvert, and Charles counties (2.4−2.7°F). Slightly below-normal maximum temperatures were observed in central Washington County (0.3°F below).

- The minimum temperature was also warmer than normal in most of the state, especially in southern Washington County, western Frederick, Montgomery, and Charles counties (1.2−1.5°F), and Garrett County (1.2°F). Slightly below-normal minimum temperatures appeared in Allegany and Wicomico counties (0.3−0.6°F below).

- Precipitation was below normal in most of the state, especially on both sides of the Bay in parts of Anne Arundel, Talbot, and Queen Anne's counties (2.1−2.4 inches deficit) and over Carroll and Washington counties (2.1 inches deficit). Above-normal precipitation occurred in Worcester County (0.9−1.2 inches) and northwestern Garrett County. Anne Arundel, Talbot, Queen Anne's, Washington, and Carroll counties received 50−55% less precipitation than their climatological monthly precipitation.

- Drought conditions improved over Garrett, Somerset, and Worcester counties, but worsened in the central and eastern Piedmont, and the majority of the counties in the Eastern Shore and parts of Saint Mary's and Calvert counties at the end of June. Garrett County, which was largely under Abnormally Dry conditions at the start of the month, is largely free of drought by the end. The conditions in the Piedmont counties, on the other hand, worsened from Moderate Drought to Severe Drought during the same period. While Anne Arundel, Prince George's, and Charles counties remained mostly under Severe Drought conditions, parts of Saint Mary's and Calvert counties, and Kent, Queen Anne's, Talbot, Caroline, and Dorchester counties transitioned from Severe Drought to Extreme Drought conditions.

Maryland Climate Divisions (Figures 6-7, B1, and B2)

- All the climate divisions were warmer than normal in June, with Climate Division 5, Northeastern Shore, having the largest departure from normal (1.7°F). All the climate divisions were drier than normal, with Climate Division 4, Upper Southern, having the largest deviation from normal (2.11 inches deficit).

- The statewide mean temperature in June was warmer than normal (1.3°F) after a colder-than-normal May (0.4°F below) and much warmer-than-normal April (4.2°F). Statewide precipitation was drier than normal this month (1.46 inches deficit), after drier-than-normal May (0.50 inches deficit) and April (1.67 inches deficit); this is the eleventh consecutive month with below-normal statewide precipitation since last August.

Extreme daily temperatures, precipitation, and growing degree days (Figures 8-10)

- Statewide maximum daily temperatures from January 1 to June 30 indicated that there were seven more hot days (maximum temperatures larger than 86°F) than normal (20 vs. 13) and one more heat wave (two or more consecutive hot days) than normal (4 vs. 3); the last two heat waves occurred in June, and the last one lasted 5 days. Similarly, there were seven more warm days (maximum temperatures larger than 80°F) than normal (39 vs. 32), and three more warm day spells (two or more consecutive warm days) than normal (8 vs. 5); of these, four warm day spells occurred in June with two lasting six days. Statewide minimum daily temperatures indicated there were three more warm nights (minimum temperatures larger than 68°F) than normal (7 vs. 4) and one more warm night spell (two or more consecutive warm nights) than normal (2 vs. 1); these two warm night spells occurred in June.

- Statewide daily total precipitation from January 1 to June 30 showed that the number of days with extreme precipitation (at least 0.64 inches –the 95th percentile in 1951−2000) was two days below normal (7 vs. 9). The number of dry spells (two or more consecutive days with daily precipitation of no more than 0.04 inches) was two fewer spells than normal (23 vs. 25); the mean duration of the dry spells was one more day longer than normal (5 vs. 4). June had one day with extreme precipitation on the 23 and had four dry spells, with the first one starting on May 29 and ending on June 6.

- The cumulative calendar year (January 1 to June 30) modified growing degree days (base 86/50°F) reached around 1655°FDD by the end of June and have been greater than normal since the second week of March, with a departure above normal of 163°FDD by the end of June. Under these conditions, the modified growing days were 6-7 days ahead of normal for this time of year; or in other words, this amount of accumulated growing degree days is normally reached around the 6th or 7th of July. Similarly, the simple

growing degree days (base 50°F) reached around 1491°FDD by the end of June and have been above normal since the last week of March, with a departure from normal of 187°FDD by the end of June. The simple growing days were 7-8 days ahead of normal for this time of year. The modified growing degree days curve closely follows last year's in June.

Historical Context (Figure 11, Tables A1 and A2)

- Statewide mean, maximum, and minimum temperatures in June 2026 (73.4, 84.6, 62.3°F) were above their (1895-2025) long-term means (71.0, 81.8, 60.2°F). The June temperatures were among the 25% of their highest values on record, with the mean equaling its 90th percentile value, and the maximum just above its 90th percentile. These temperatures were far from any warm records for the month: 76.6°F for the mean temperature set in 1943, 87.7°F for the maximum temperature set in 1925, and 65.9°F for the minimum temperature set in 1943. Statewide precipitation (2.75 inches) in June was below the long-term mean (3.93 inches), and within 25% of the lowest values on record but still far from the driest record of 0.93 inches in 1988.

- Statewide mean, maximum, and minimum temperatures indicated that June 2026 was the fourteenth, twelfth, and twenty-third warmest June since 1895, respectively. In terms of the mean temperatures, Caroline County recorded its eighth-warmest June, and Prince George's and Queen Anne's recorded their ninth. And when considering the maximum temperatures, Caroline and Wicomico counties had their fifth-warmest June, Dorchester County its sixth, and Somerset and Worcester their seventh. The county closest to a record minimum temperature was Charles County, which recorded its fifteenth-warmest June.

- Statewide precipitation in June 2026 (2.75 inches) indicated that this was the thirty-third driest June on record. Among the counties, Washington County had its eleventh-driest June on record, while Talbot had its fifteenth and Frederick had its nineteenth.

Century-Plus Trends, 1895-2026 (Figures 12, 13)

- Statewide mean temperature and cooling degree days in June showed significant trends: a warming trend (1.9°F/century) and an increasing cooling trend (54.7°FDD/century). On the other hand, precipitation had a minuscule, non-significant drying trend (−0.03 in/century).

- Regionally, mean temperatures in June showed significant warming trends in most of the state, except in Garrett and Allegany counties. The largest warming trends were observed over Baltimore City (3.0−3.2°F/century) and the counties of the central Piedmont (2.2−2.8°F/century) and Eastern Shore (2.4−2.6°F/century).

- Regionally, June precipitation displayed small areas of contrasting significant trends. Significant wetting trends were found over northern Cecil County (0.7−0.8 in/century), while significant drying trends were found over southwestern Charles County and Washington County (−0.7 in/century).

Chesapeake Bay Sea Surface Temperatures (Figures 14, 15, E1)

- Sea surface temperatures in the Chesapeake Bay in June 2026 were between 74 and 77°F. Regionally, they were colder than the 2007-2020 mean across the Bay, especially along both coasts (1.6°F below and larger). The all-basin mean temperature of 74.5°F in June was below the 2007-2020 base-period mean (76.0°F) but well below the coldest June (71.7°F in 2023) in the 20-year dataset (2007-2026).

Contents

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 2026 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 in Section 3. Statewide and climate division averages for the month are compared using scatter plots in Section 4. Extreme warm daily 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 historical context using 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. Maps of monthly sea surface temperature (SST) in the Chesapeake Bay are presented in Section 8, along with basin averages and their annual evolution for the month. Ancillary statewide, climate division, and county-level information for air temperatures and precipitation are 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; mean and variability of the sea surface temperatures in the Chesapeake Bay are displayed in Appendix E.

2. Data and 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) for 1895-present. Available in preliminary status at: https://www.ncei.noaa.gov/data/nclimgrid-monthly/access/
  Data was downloaded on July 9, 2026.

- NOAA Monthly U.S. Climate *Divisional* Dataset (NClimDiv – Vose et al., 2014) for 1895-present. Available in preliminary status (v1.0.0-20260707) at:
  https://www.ncei.noaa.gov/pub/data/cirs/climdiv/
  Data was downloaded on July 9, 2026.

- NOAA area averages of daily temperatures and precipitation dataset (nClimGrid−Daily −Durre et al., 2022) for 1951-present. 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 6, 2026.

Drought conditions are from the U.S. Drought Monitor website:
https://droughtmonitor.unl.edu/Maps/MapArchive.aspx

Data and sources for the Chesapeake Bay are the following:

- Satellite-based sea surface temperatures from NOAA's CoastWatch Program. The data was made available by the Program's East Coast Node. This satellite-based sea surface temperature data uses data from the Advanced Very High Resolution Radiometer (AVHRR) on the European MetOp satellites, and the Visible Infrared Imaging Radiometer Suite (VIIRS) on the U.S. SNPP and NOAA JPSS satellites. In creating this product, nighttime overpasses for the U.S. East Coast are used, thereby avoiding daytime solar heating of the ocean surface and the associated warm bias in the data. In particular, the acquired product consists of monthly sea surface temperature data for the Chesapeake and Delaware Bays, with a nominal horizontal resolution of 750 m from 2007 to the present. This product is available at:
  https://eastcoast.coastwatch.noaa.gov/data/avhrr-viirs/sst-ngt
  Data was downloaded on July 8, 2026.

- A shapefile of watersheds for the state from the Maryland Department of the Environment and the Department of Natural Resources: the Maryland Watersheds – 8 Digit Watersheds. It contains 138 separate watersheds, identified with an 8-digit numeric code from which three are on the main steam of the Chesapeake Bay: the Upper Chesapeake Bay (code: 02139996; from the mouth of the Susquehanna River to northern side of the mouth of the Gunpowder River), the Middle Chesapeake Bay (code: 02139997; from the Gunpowder River to the mouth of the Chester River), and the Lower Chesapeake Bay (code: 02139998; from the south side of the mouth of the Chester River to the mouth of the Potomac River), which in turn are used to create a one-watershed shapefile for the entire basin. These four watersheds are used to create area-averaged sea surface temperatures for the Bay. The shapefile and associated files are available at:
  https://data.imap.maryland.gov/datasets/maryland::maryland-watersheds-8-digit-watersheds/about

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 long-term average of weather elements. 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 average 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 because 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.

It should be noted that the satellite-based sea surface temperature data set has a short temporal coverage of 20 years, from 2007 to the present, which prevents the calculation of its current climate normal (1991-2020). Instead, the 2007-2020 mean will be used without referring to it as a climatology.

About the anomalies: Anomalies for a given month (e.g., June 2026) 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 a negative anomaly. In the case of the sea surface temperature anomalies, they are calculated with respect to their 2007-2020 mean.

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 as the average of 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 occurs only if the temperature exceeds a minimum development threshold temperature, or, in other words, if enough warmth is accumulated. Because actual development varies across plants and insects, and the presence of weeds and precipitation can influence it, 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 like 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 at temperatures below 50°F or above 86°F.

About extreme precipitation. This is defined as the number of days per year on which statewide-averaged daily total precipitation is 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 2026 Maps

A. Mean Temperatures

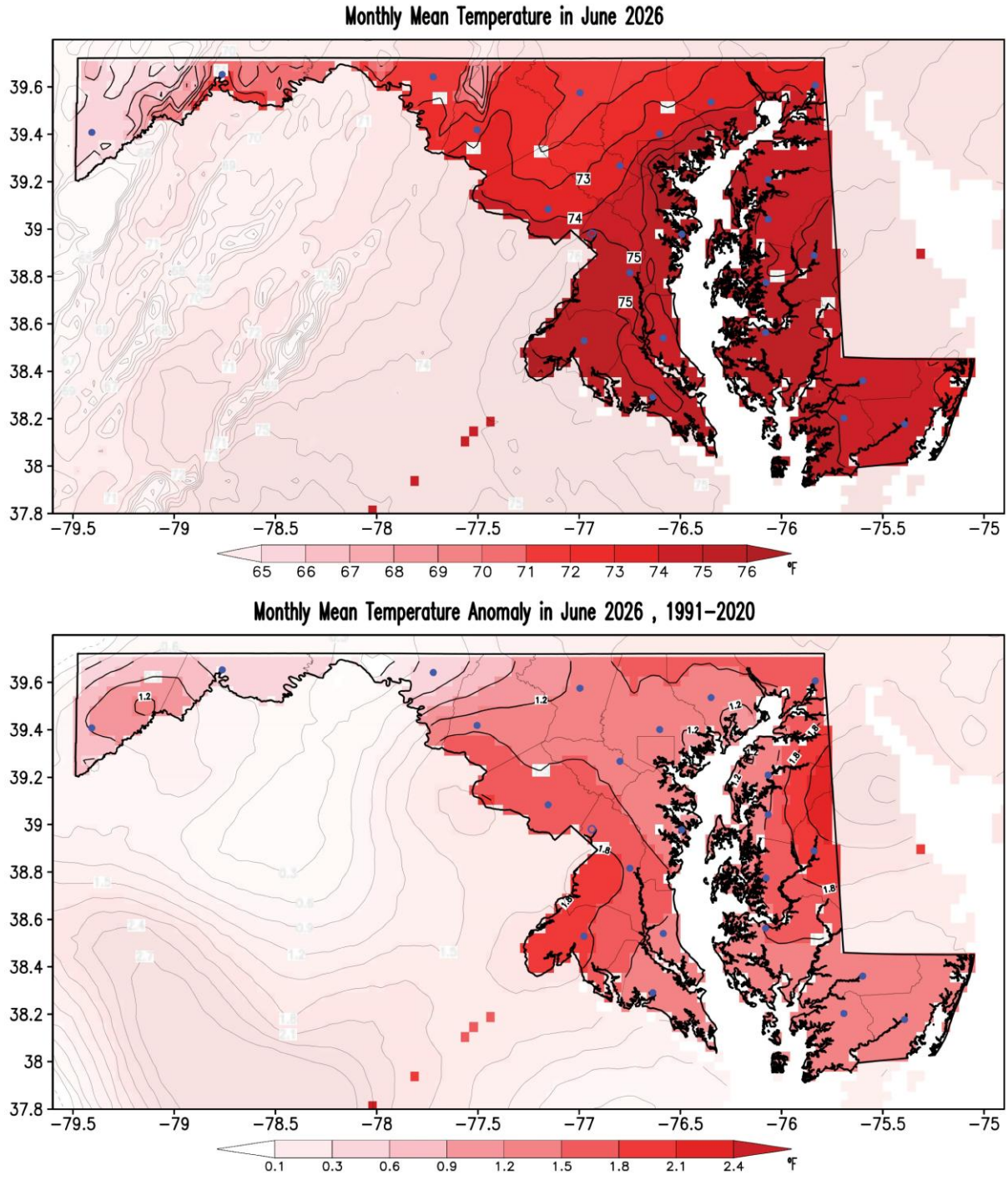

Figure 1. Monthly mean surface air temperature (top panel) and its anomaly with respect to the 1991-2020 climatology (bottom panel) for June 2026. Temperatures are in °F following the color bar. Red shading in the anomaly map marks warmer-than-normal conditions. Note shading outside the state has been washed out to facilitate focus on Maryland. Filled blue circles mark the county seats.

B. Maximum Temperatures

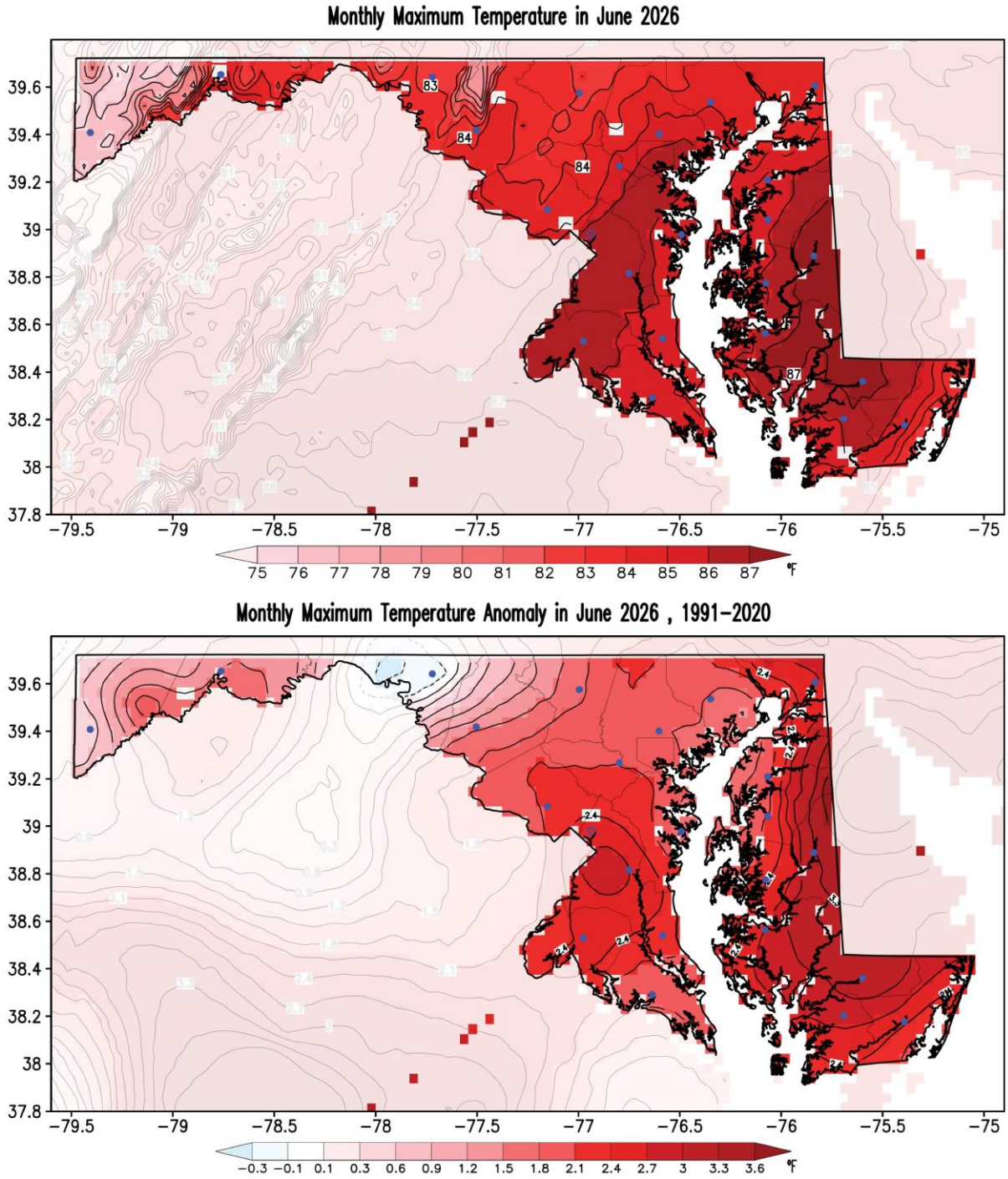

Figure 2. Monthly maximum surface air temperature (top panel) and its anomaly with respect to the 1991-2020 climatology (bottom panel) for June 2026. Temperatures are in °F following the color bar. Blue/red shading in the anomaly map marks colder/warmer-than-normal conditions. Note shading outside the state has been washed out to facilitate focus on Maryland. Filled blue circles mark the county seats.

C. Minimum Temperatures

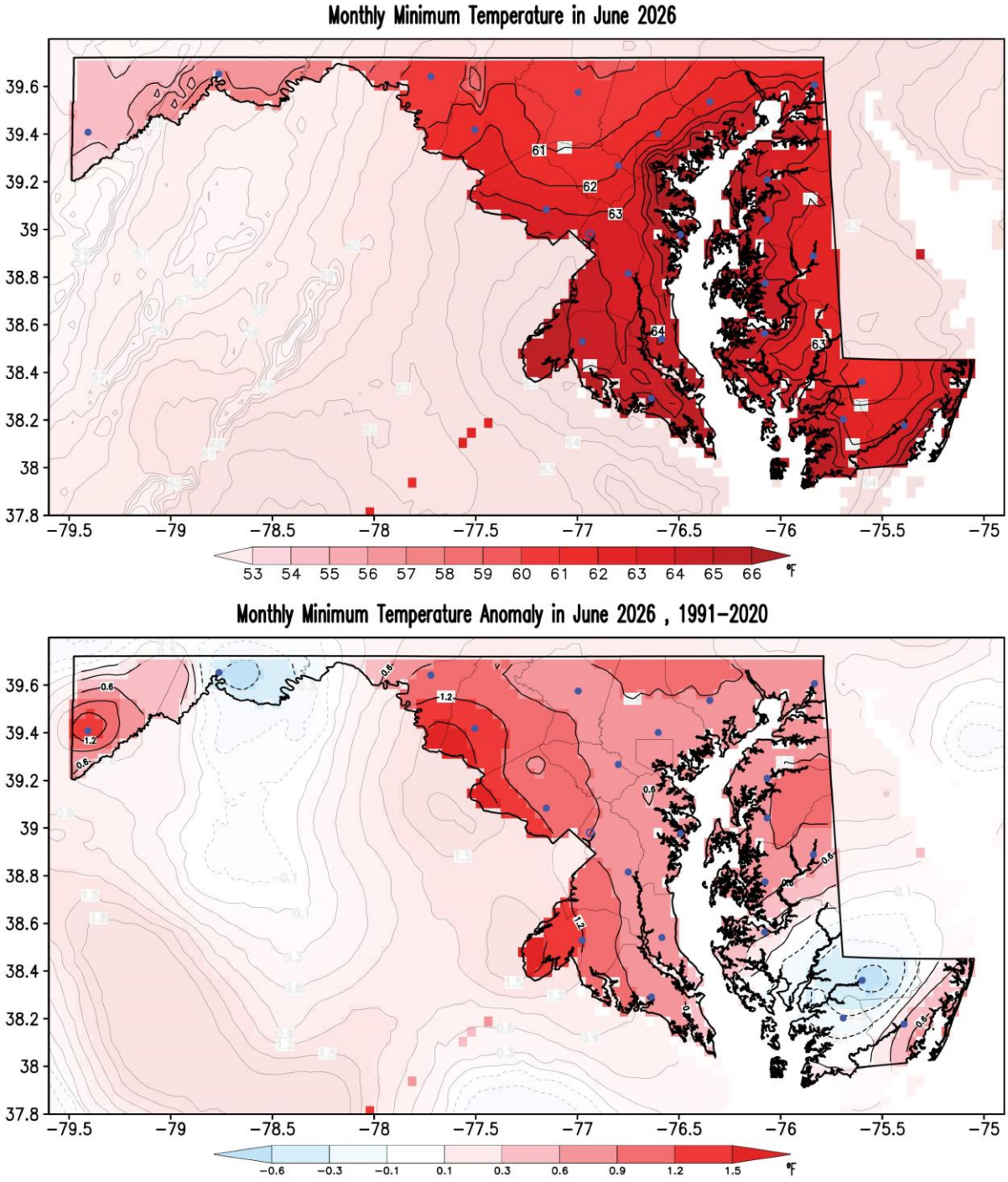

Figure 3. Monthly minimum surface air temperature (top panel) and its anomaly with respect to the 1991-2020 climatology (bottom panel) for June 2026. Temperatures are in °F following the color bar. Blue/red shading in the anomaly map marks colder/warmer-than-normal conditions. Note shading outside the state has been washed out to facilitate focus on Maryland. Filled blue circles mark the county seats.

D. Precipitation

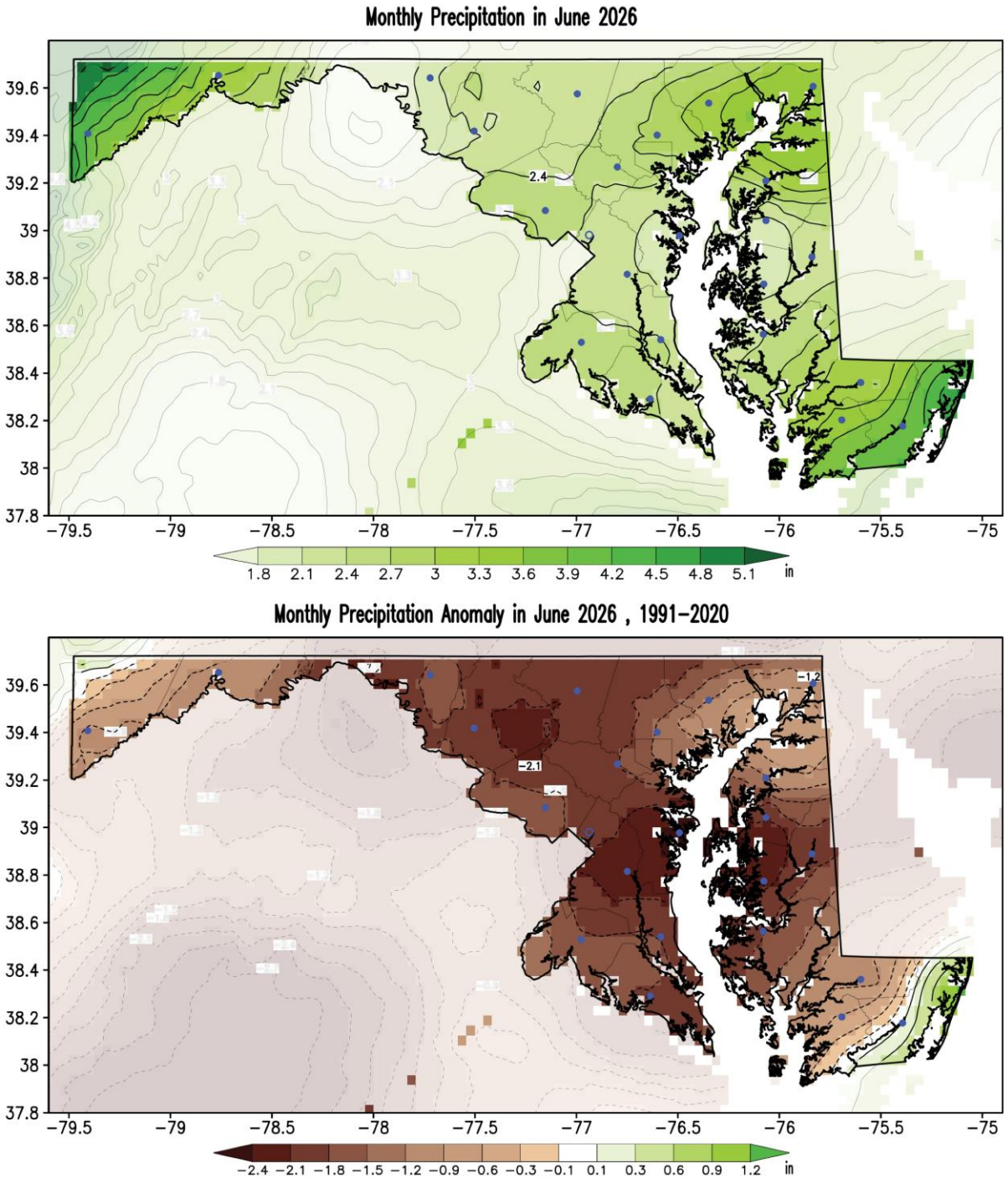

Figure 4. Monthly total precipitation (top panel) and its anomaly with respect to the 1991-2020 climatology (bottom panel) for June 2026. Precipitation is measured in inches, as indicated by the color bar. Brown/green shading in the anomaly map indicates drier/wetter-than-normal conditions. Note shading outside the state has been washed out to facilitate focus on Maryland. Filled blue circles mark the county seats.

E. Drought

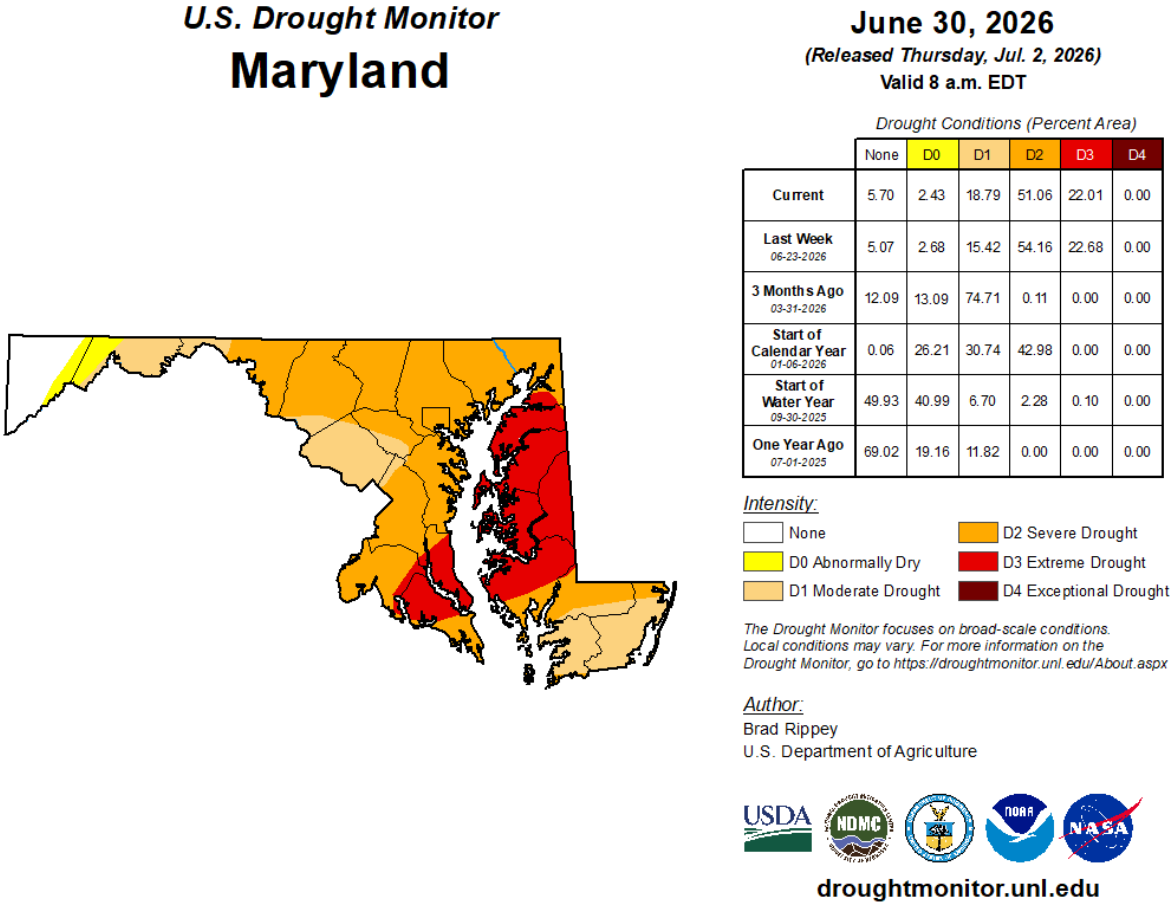

Figure 5. Drought conditions as reported by the U.S. Drought Monitor on June 30, 2026. Drought conditions improved over Garrett, Somerset and Worcester counties, but worsened in the central and eastern Piedmont, and the majority of the counties in the Eastern Shore and parts of Saint Mary's and Calvert counties. White shading indicates regions without drought. Yellow shading indicates Abnormally Dry regions; light orange shading shows regions under a Moderate Drought, dark orange shading shows regions under Severe Drought, and red shading (in the southern-most tip of Saint Mary's County) shows regions under Extreme Drought. Numbers in the table indicate the percentage of the state covered under the particular drought category at the time (in the left column). Typically, areas shown in yellow (Abnormally Dry) indicate land that is entering or exiting drought. Light orange areas (Moderate Drought) highlight land that may experience a low water supply and crop and pasture damage. Dark orange areas (Severe Drought) show land with water shortages and an increased likelihood of crop and pasture losses. Red areas (Extreme Drought) indicate land where crop losses are widespread, streamflow is severely reduced, river water temperatures are warm, and wells are running dry. Current conditions can be monitored on the U. S. Drought Monitor website. 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.

4. June and AMJ 2026 Statewide and Climate Divisions Averages

A. June Scatter Plots

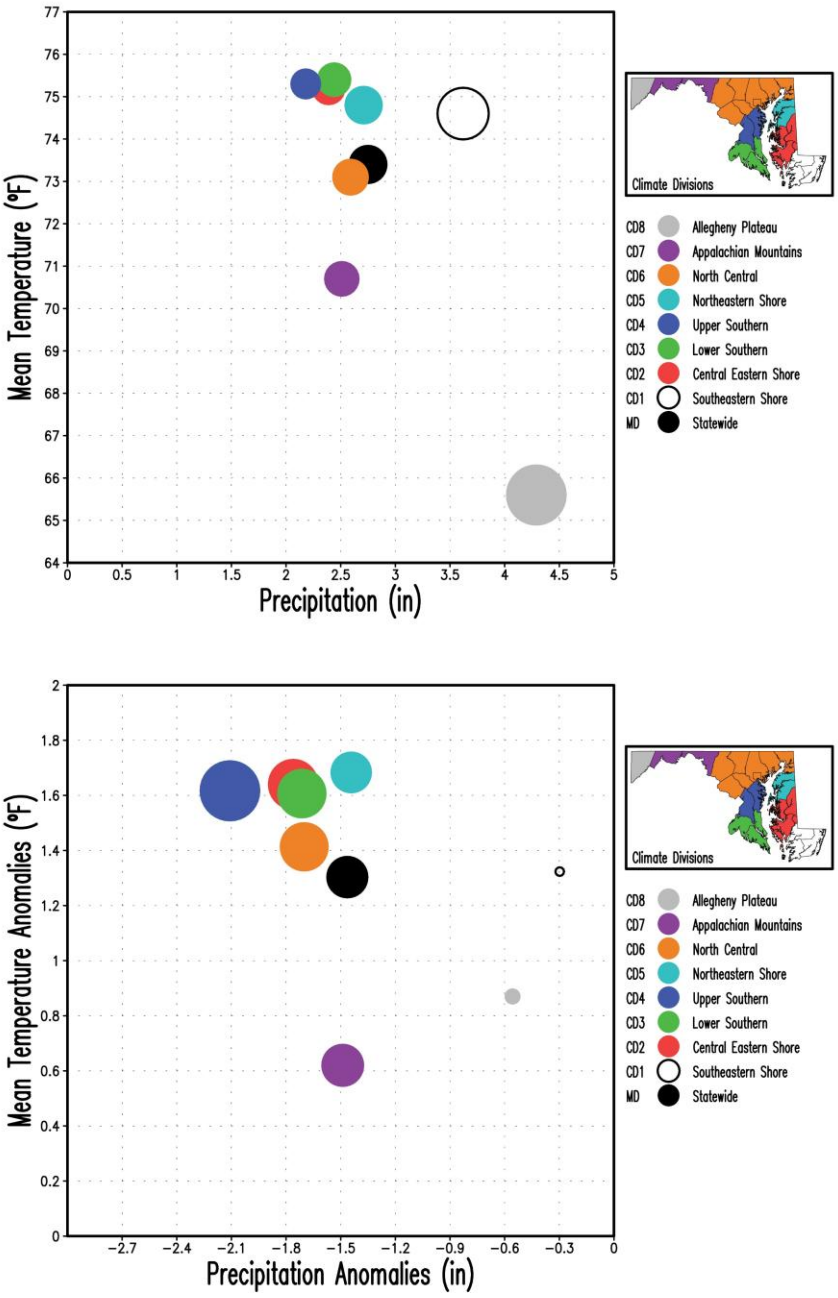

Figure 6. Scatter plots of Maryland (statewide) and Climate Divisions (CD#) monthly mean surface air temperature vs. total precipitation for June 2026. The upper panel displays the mean temperature and total precipitation, while the bottom panel displays their anomalies relative to the 1991-2020 climatology. 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 (4.29 inches in CD8, top panel) and by the maximum precipitation anomaly (|−2.11| inches in CD4, 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 Scatter Plots

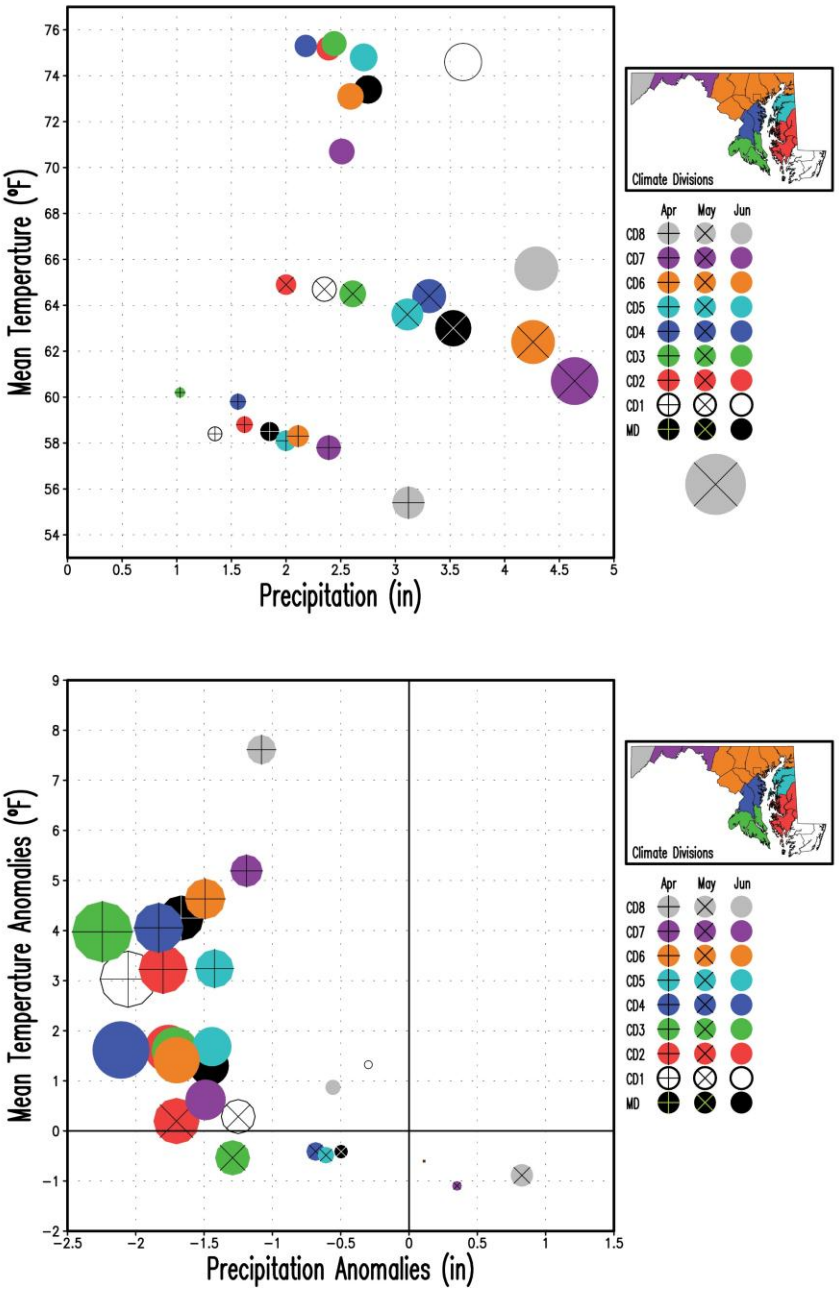

Figure 7. Scatter plots of Maryland (statewide) and Climate Divisions (CD#) monthly mean surface air temperature vs. total precipitation for April, May, and June 2026. The upper panel displays the mean temperature and total precipitation, while the bottom panel shows their anomalies relative to the 1991-2020 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 (5.93 inches in CD8 in May, top panel) and by the maximum precipitation anomaly (|−2.24| inches in CD3 in April, 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 in Statewide Averages

A. Hot Days, Warm Days, and Warm Nights

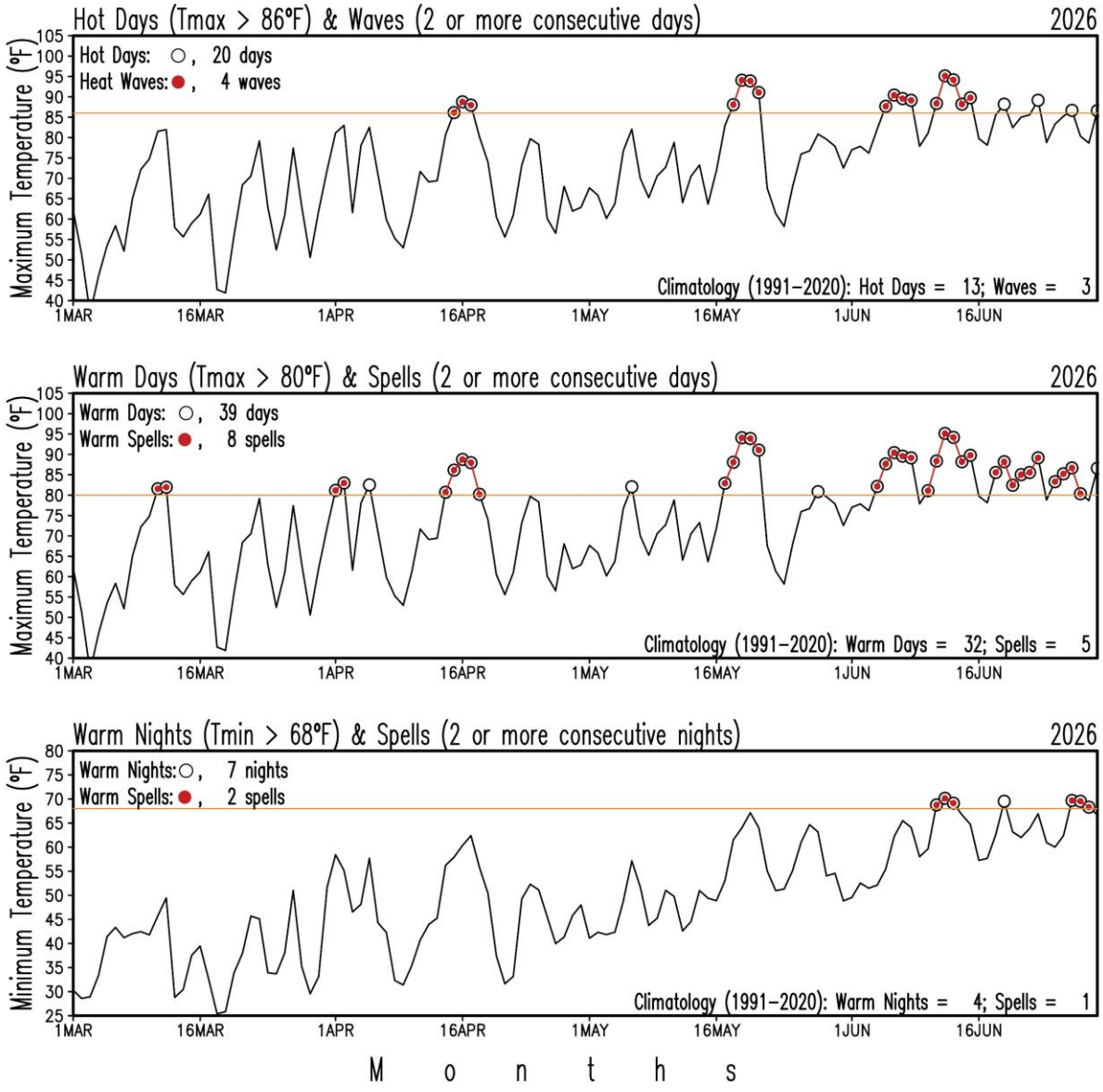

Figure 8. Maryland (statewide) number of hot days, warm days, warm nights, and their consecutive occurrence for the period January 1 – June 30, 2026. The upper panel shows hot days in open circles and heat waves in red-filled circles from statewide daily maximum temperatures. The middle panel shows warm days in open circles and warm day spells in red-filled circles from statewide daily maximum temperatures. The bottom panel shows 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, along with near-real-time figures.

B. Extreme Precipitation and Dry Spells

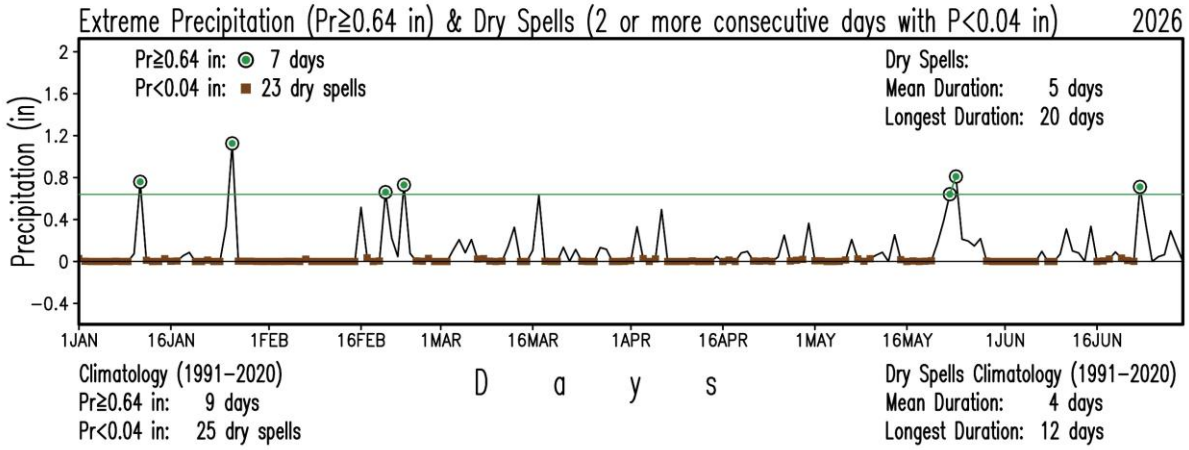

Figure 9. Maryland (statewide) number of days with extreme precipitation and dry spells for the period January 1 – June 30, 2026. Days with extreme precipitation (precipitation of 0.64 in or more) are identified by green-filled circles. Dry spells (consecutive days with daily total precipitation less 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, along with near-real-time figures.

C. Modified and Simple Growing Degree Days

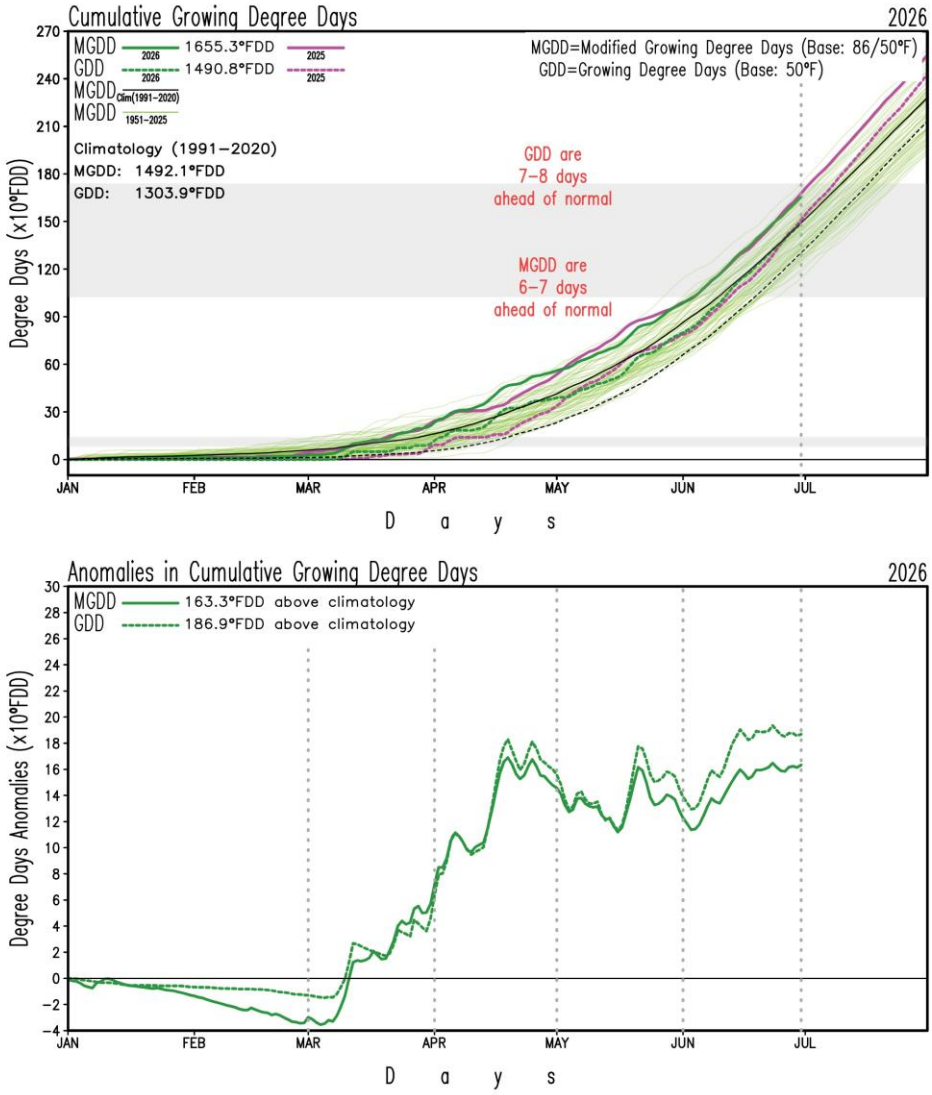

Figure 10. Maryland (statewide) cumulative modified and simple growing degree days (upper panel) and their anomaly with respect to the 1991-2020 climatology (lower panel) for the period January 1 – June 30, 2026. The modified growing degree days are shown with the continuous thick green line in the upper panel and for reference their 1991-2020 climatology and the year 2025 are displayed with continuous black and purple lines, respectively; the continuous thin light-green lines display the cumulative modified growing degree days every year from 1951 to 2024. Similarly, the simple growing degree days are shown as dashed lines. The gray shaded areas mark a range of values for emergence (82-140), and tassel-silk (1024-1740) in corn development (IPAD, 2023). The red annotations in the upper panel display how many days ahead of climatology the June 30 accumulated values were. Anomalies relative to the 1991-2020 climatology in the cumulative modified growing degree days (bottom panel) are displayed as the continuous green line, while those for the growing degree days are shown as 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, along with near-real-time figures.

6. June 2026 Statewide Averages in the Historical Record

A. Box and Whisker Plots

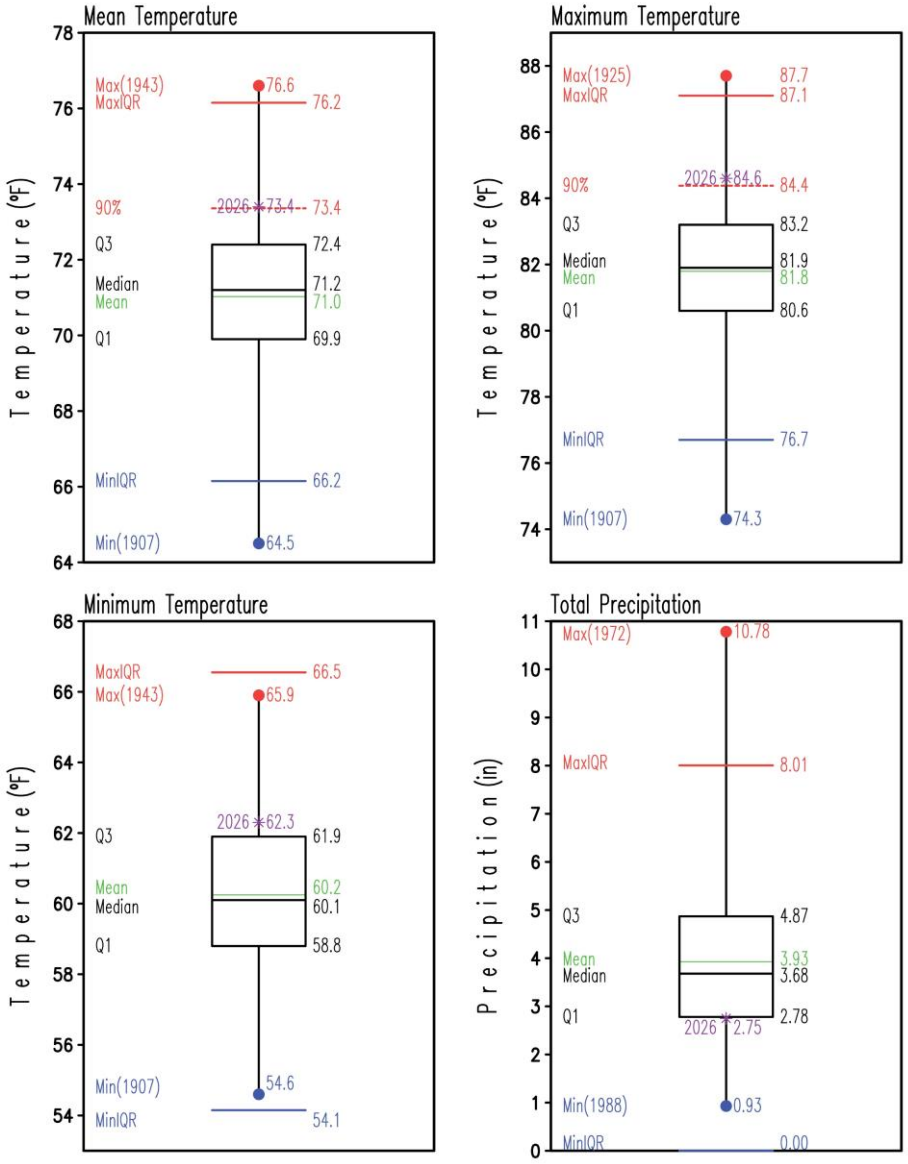

Figure 11. Box and Whisker plots of Maryland (statewide) monthly mean (upper left), maximum (upper right), minimum (lower left) surface air temperatures, and total precipitation (lower right) for June for the period 1895-2025. Conditions for June 2026 are represented by the label and asterisk in purple. Statistics for the period 1895-2025 are labeled at the left side of each box and whisker plot, and their values are 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 90 percentile for the mean and maximum temperatures are displayed with a horizontal dashed, red 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 parentheses. The blue and red horizontal lines represent extreme values defined by Q1-1.5×(Q3-Q1) and Q3+1.5×(Q3-Q1), respectively.

7. 1895-2026 June Trends

A. Statewide Averages in Mean Temperature, Cooling Degree Days, and Precipitation

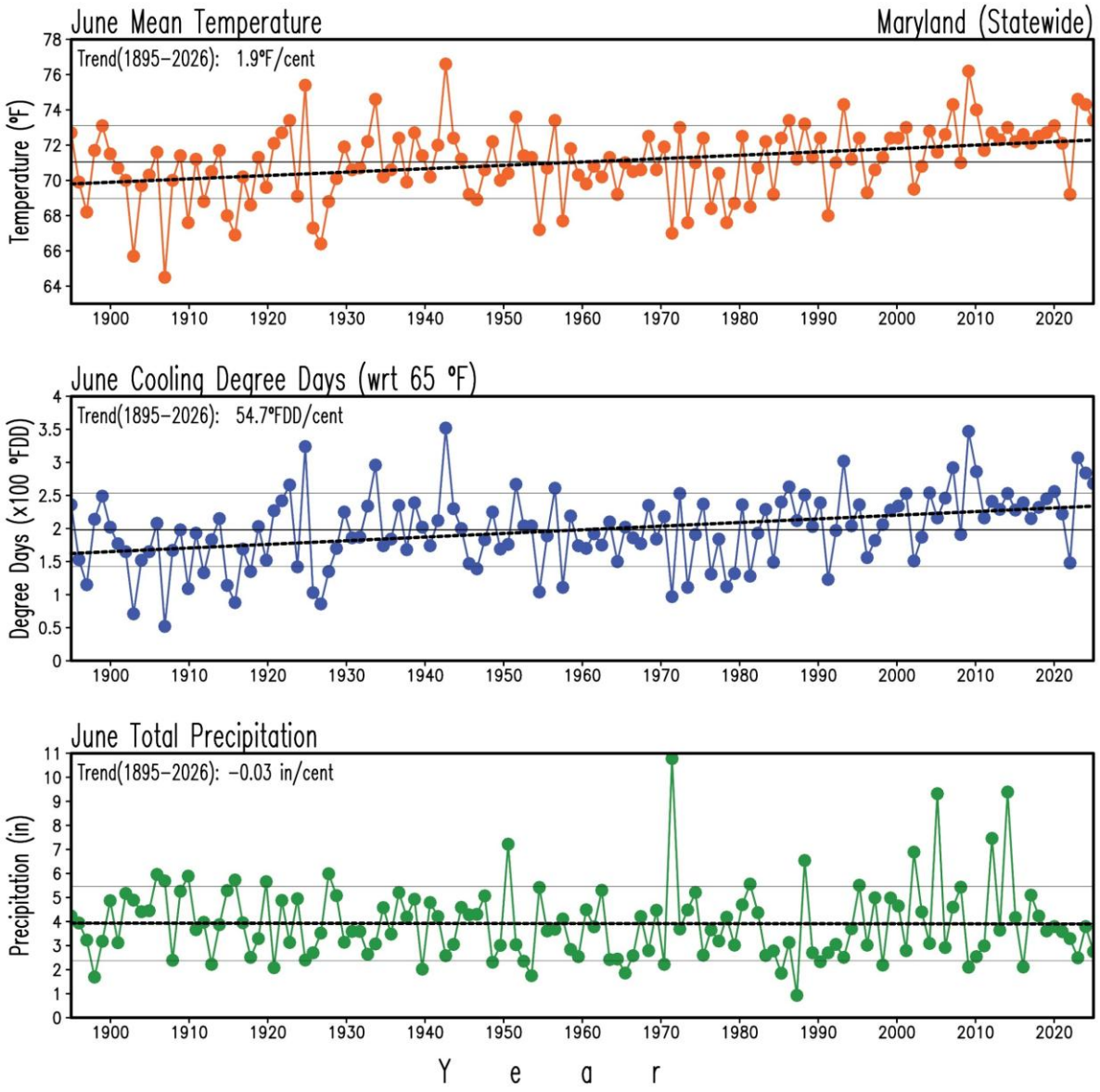

Figure 12. Maryland (statewide) mean surface air temperature, cooling degree days, and precipitation in June for the period 1895-2026. Temperature is in °F, cooling degree-days are in °F, and precipitation is in inches. The thin, continuous black lines in each panel display the long-term means (71.0°F, 198.1°FDD, and 3.92 in, 1895-2026), and the double thin, continuous gray lines indicate the standard deviation (2.1°F, 55.4°FDD, and 1.54 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 (54.7°FDD/century) are statistically significant at the 95% level (*Student's t-test* −Santer et al. 2000) but no the miniscule precipitation drying trend (−0.03 in/century).

B. Temperature and Precipitation Maps

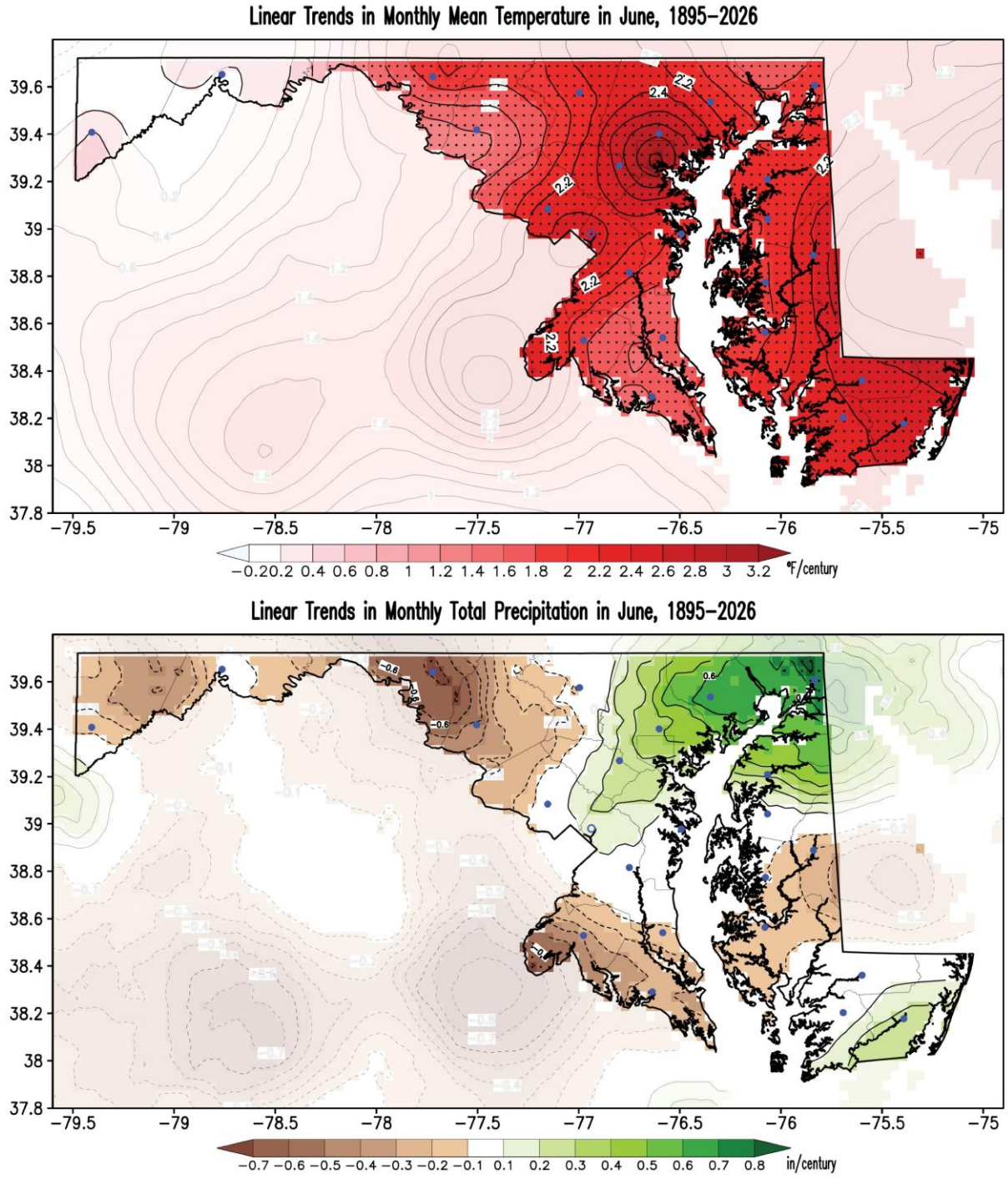

Figure 13. Linear trends in surface air mean temperature and precipitation in June for the period 1895-2026. Temperatures are in °F/century, and precipitation is in inches/century following the color bars. Blue/red shading in the temperature map marks cooling/warming trends. Brown/green shading in the 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 focus on Maryland. Filled blue circles mark the county seats.

8. Chesapeake Bay's Sea Surface Temperatures

A. June 2026 Sea Surface Temperature Maps

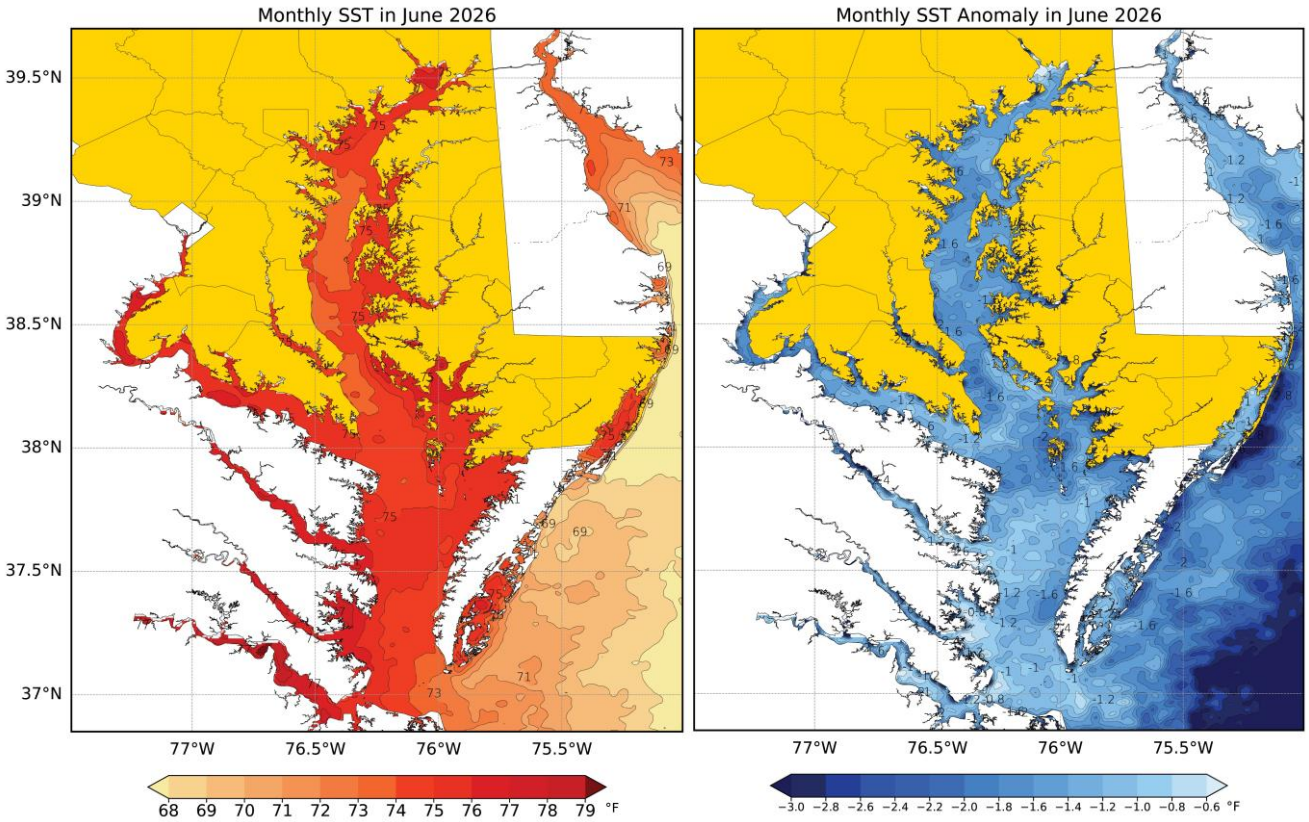

Figure 14. Monthly sea surface temperature (left panel) and its anomaly (right panel) in the Chesapeake Bay and surrounding coastal areas in June 2026. Temperatures are in °F, following the color bar. Blue shading in the anomaly map marks colder temperatures than the 2007-2020 mean. For clarity, the temperatures and their anomalies have been smoothed using a 9-point spatial smoother applied four times. Note that Maryland has been shaded yellow to facilitate focus on the state waters.

B. June Upper, Middle, Lower, and Entire Basins Sea Surface Temperature Averages

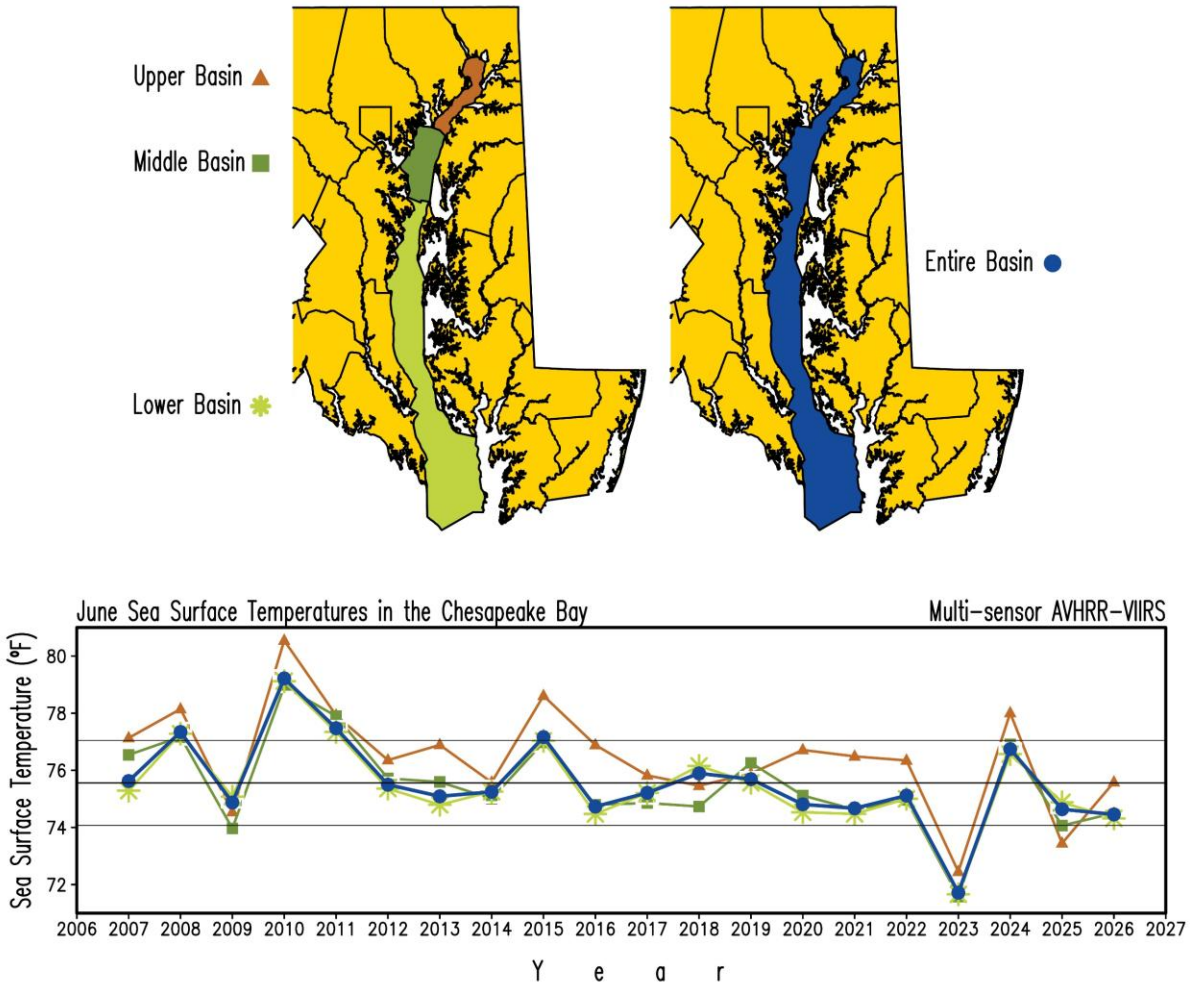

Figure 15. Watersheds in the Chesapeake Bay (top panel) and their area-averaged sea surface temperatures in June for the period 2007-2026 (bottom panel). Temperatures are in °F. The color of the lines corresponds to the color of the watersheds in the Bay, as indicated on the maps: Brown for the Upper Bay, dark green for the Middle Bay, light green for the Lower Bay, and Navy Blue for the Entire Bay. The mean temperature for the Entire basin in June 2026 was 74.5°F, while for the Upper, Middle, and Lower basins was 75.6, 74.5, and 74.3°F, respectively. The thin, continuous black line in the lower panel displays the 2007-2026 mean for the Entire Basin (75.6°F), and the double thin, continuous gray lines indicate the standard deviation (1.5°F) above/below the long-term mean. The 2007-2026 mean temperatures for the Upper, Middle, and Lower basins in May were 76.4, 75.5, and 75.5°F, with standard deviations of 1.8, 1.6, and 1.5°F, respectively.

Appendix A. June 2026 Data Tables: Statewide, Climate Divisions, and Counties

A. Mean Temperature and Precipitation

Region	Mean Air Temperature (°F)	Rank (#)
Statewide	73.4	119
Climate Division 1	74.6	120
Climate Division 2	75.2	123
Climate Division 3	75.4	122
Climate Division 4	75.3	123
Climate Division 5	74.8	124
Climate Division 6	73.1	120
Climate Division 7	70.7	94
Climate Division 8	65.6	89
Allegany	69.9	91
Anne Arundel	75.4	122
Baltimore	73.4	120
Baltimore City	75.3	121
Calvert	75.0	120
Caroline	75.1	125
Carroll	71.9	119
Cecil	73.8	123
Charles	75.7	122
Dorchester	75.2	120
Fredrick	72.2	117
Garrett	65.6	89
Harford	73.6	120
Howard	73.1	122
Kent	74.7	122
Montgomery	73.5	122
Prince George's	75.2	124
Queen Anne's	74.9	124
Saint Mary's	75.2	118
Somerset	75.1	119
Talbot	75.2	119
Washington	71.4	93
Wicomico	74.7	118
Worcester	74.2	120

Region	Total Precipitation (in)	Rank (#)
Statewide	2.75	33
Climate Division 1	3.62	70
Climate Division 2	2.39	29
Climate Division 3	2.44	24
Climate Division 4	2.18	23
Climate Division 5	2.71	40
Climate Division 6	2.59	26
Climate Division 7	2.51	24
Climate Division 8	4.29	58
Allegany	3.15	45
Anne Arundel	2.10	23
Baltimore	2.63	33
Baltimore City	2.66	38
Calvert	2.32	22
Caroline	2.32	27
Carroll	2.24	24
Cecil	3.41	55
Charles	2.48	24
Dorchester	2.56	35
Fredrick	2.18	19
Garrett	4.29	58
Harford	3.07	41
Howard	2.40	28
Kent	3.05	55
Montgomery	2.52	30
Prince George's	2.26	25
Queen Anne's	2.42	32
Saint Mary's	2.44	28
Somerset	3.50	69
Talbot	2.03	15
Washington	1.90	11
Wicomico	3.16	59
Worcester	4.05	90

Table A1. Monthly mean surface air temperature (left) and total precipitation (right) at Maryland (statewide), climate division, and county levels for June 2026. Temperatures are in °F, and precipitation is in inches. The rank is the position the variable for June 2026 occupies among the 132 Junes, after the 132 values have been arranged from lowest to highest using the *standard competition ranking method*. The closer to 132 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 (#)
Statewide	84.6	121
Climate Division 1	85.7	127
Climate Division 2	86.8	127
Climate Division 3	85.8	120
Climate Division 4	86.2	122
Climate Division 5	85.8	121
Climate Division 6	84.2	117
Climate Division 7	82.9	91
Climate Division 8	76.6	74
Allegany	83.0	92
Anne Arundel	86.0	120
Baltimore	84.8	118
Baltimore City	86.2	122
Calvert	85.4	119
Caroline	87.4	128
Carroll	83.3	114
Cecil	84.6	121
Charles	86.4	122
Dorchester	86.7	127
Fredrick	83.2	105
Garrett	76.7	77
Harford	84.6	119
Howard	84.6	122
Kent	85.3	120
Montgomery	84.4	119
Prince George's	86.4	122
Queen Anne's	85.9	122
Saint Mary's	85.4	116
Somerset	85.8	126
Talbot	86.0	123
Washington	82.8	81
Wicomico	86.9	128
Worcester	84.8	126

Region	Minimum Air Temperature (°F)	Rank (#)
Statewide	62.3	110
Climate Division 1	63.5	97
Climate Division 2	63.6	105
Climate Division 3	64.9	114
Climate Division 4	64.4	116
Climate Division 5	63.8	115
Climate Division 6	62.0	114
Climate Division 7	58.5	90
Climate Division 8	54.5	100
Allegany	56.8	79
Anne Arundel	64.8	112
Baltimore	62.0	115
Baltimore City	64.4	111
Calvert	64.5	109
Caroline	62.8	110
Carroll	60.4	113
Cecil	62.9	116
Charles	65.0	118
Dorchester	63.8	98
Fredrick	61.2	110
Garrett	54.5	100
Harford	62.7	115
Howard	61.7	112
Kent	64.1	116
Montgomery	62.7	116
Prince George's	63.9	116
Queen Anne's	63.9	116
Saint Mary's	64.9	107
Somerset	64.3	97
Talbot	64.5	111
Washington	60.1	107
Wicomico	62.4	88
Worcester	63.6	101

Table A2. Monthly maximum (left) and minimum (right) surface air temperatures at Maryland (statewide), climate division, and county levels for June 2026. Temperatures are in °F. The rank is the position the variable for June 2026 occupies among the 132 Junes, after the 132 values have been arranged from lowest to highest using the *standard competition ranking method*. The closer to 132 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 2026 Bar Graphs: Statewide, Climate Divisions, and Counties

A. Temperatures and Precipitation

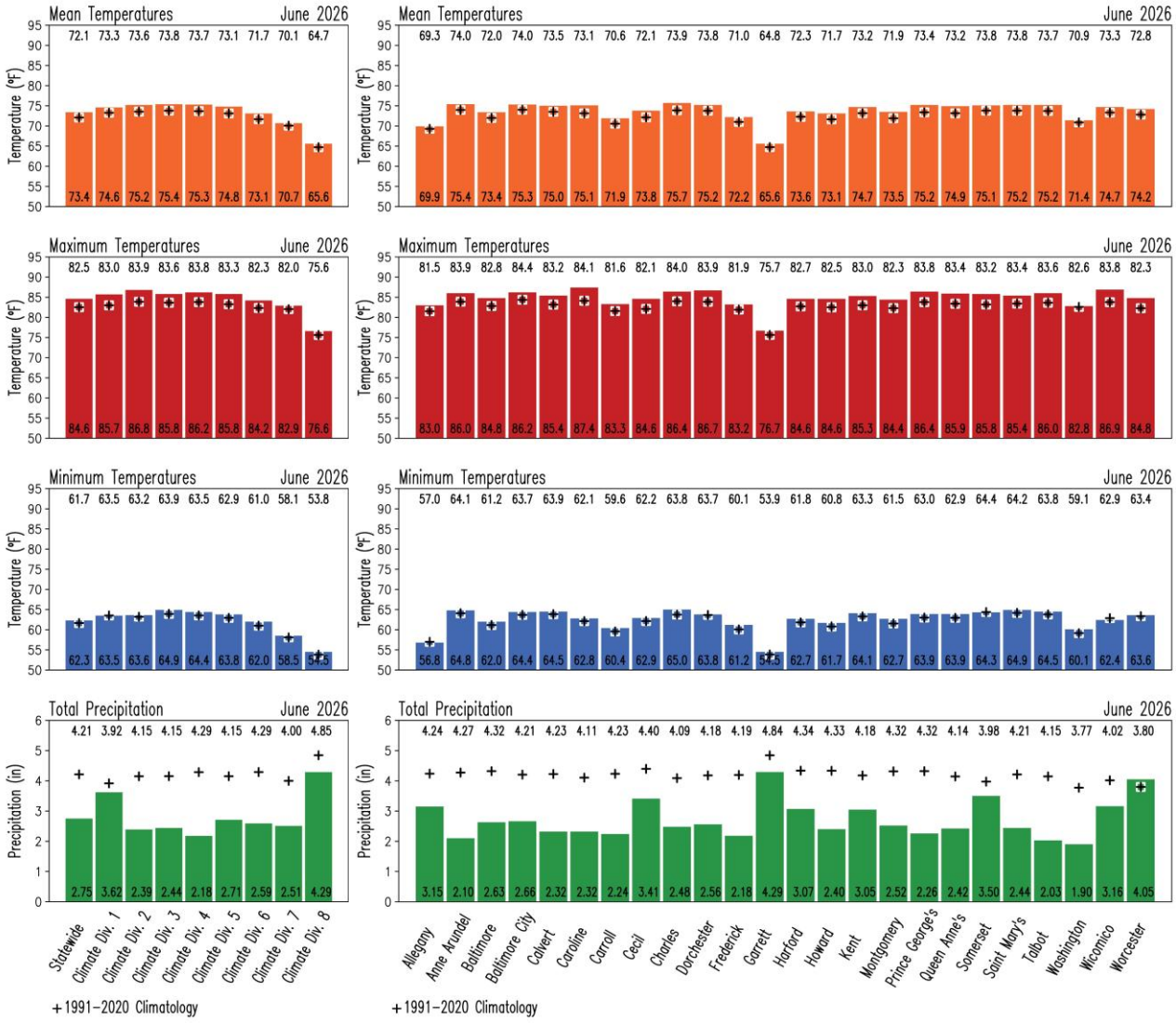

Figure B1. Monthly surface variables for Maryland in June 2026. Color bars represent the variables as follows: mean surface air temperature (orange), maximum surface air temperature (red), minimum surface air temperature (blue), and total precipitation (green) at statewide and climate division (left 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 2026. 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

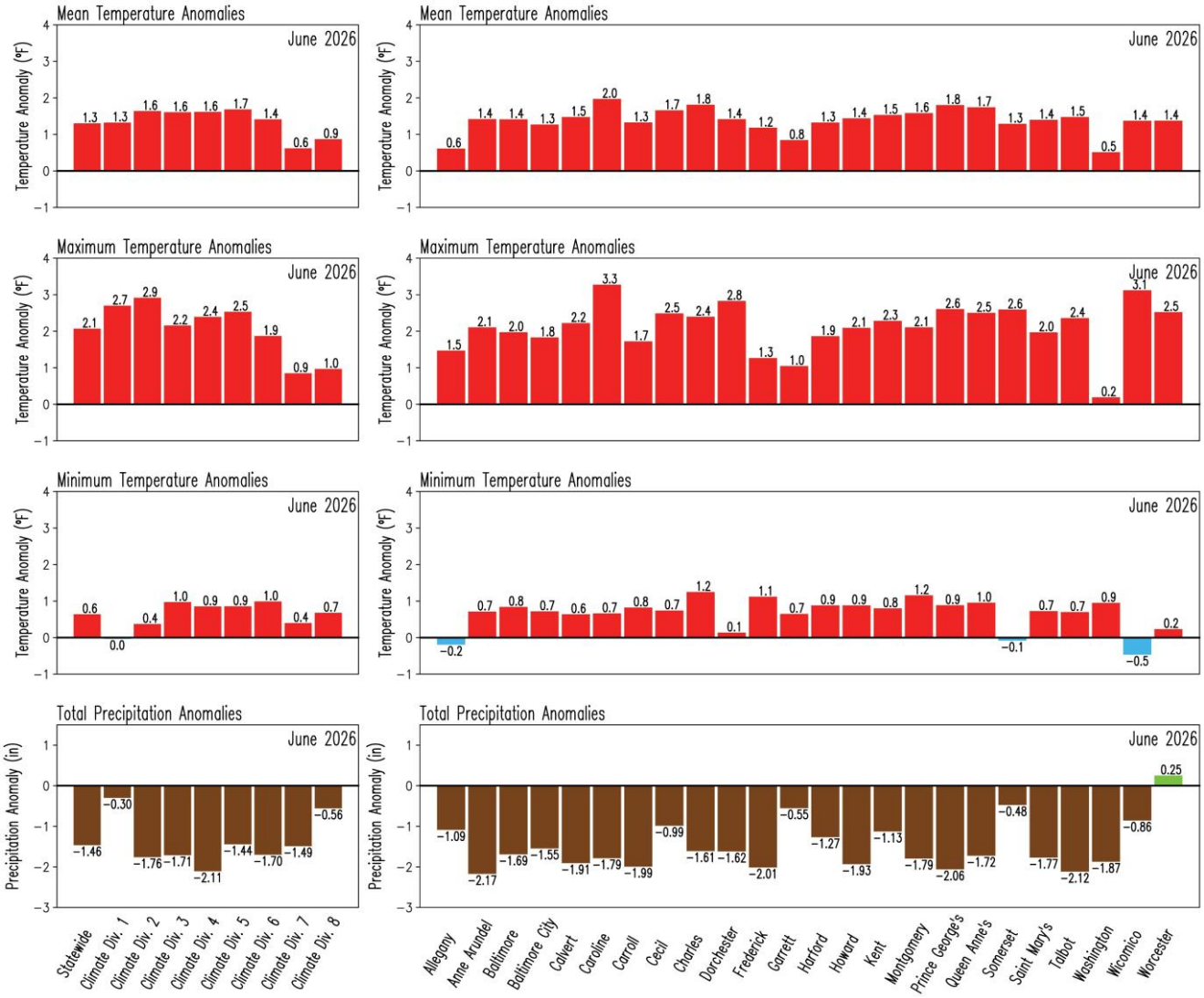

Figure B2. Anomalies in the monthly surface variables for Maryland in June 2026. Anomalies are with respect to the 1991-2020 climatology. Red/blue color represents positive/negative (warmer/colder than normal) anomalies for mean surface air temperature (upper row), maximum surface air temperature (second 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 2026.

Appendix C. June 1991-2020 Climatology and June 2026 Precipitation as Percentage of Climatology Maps

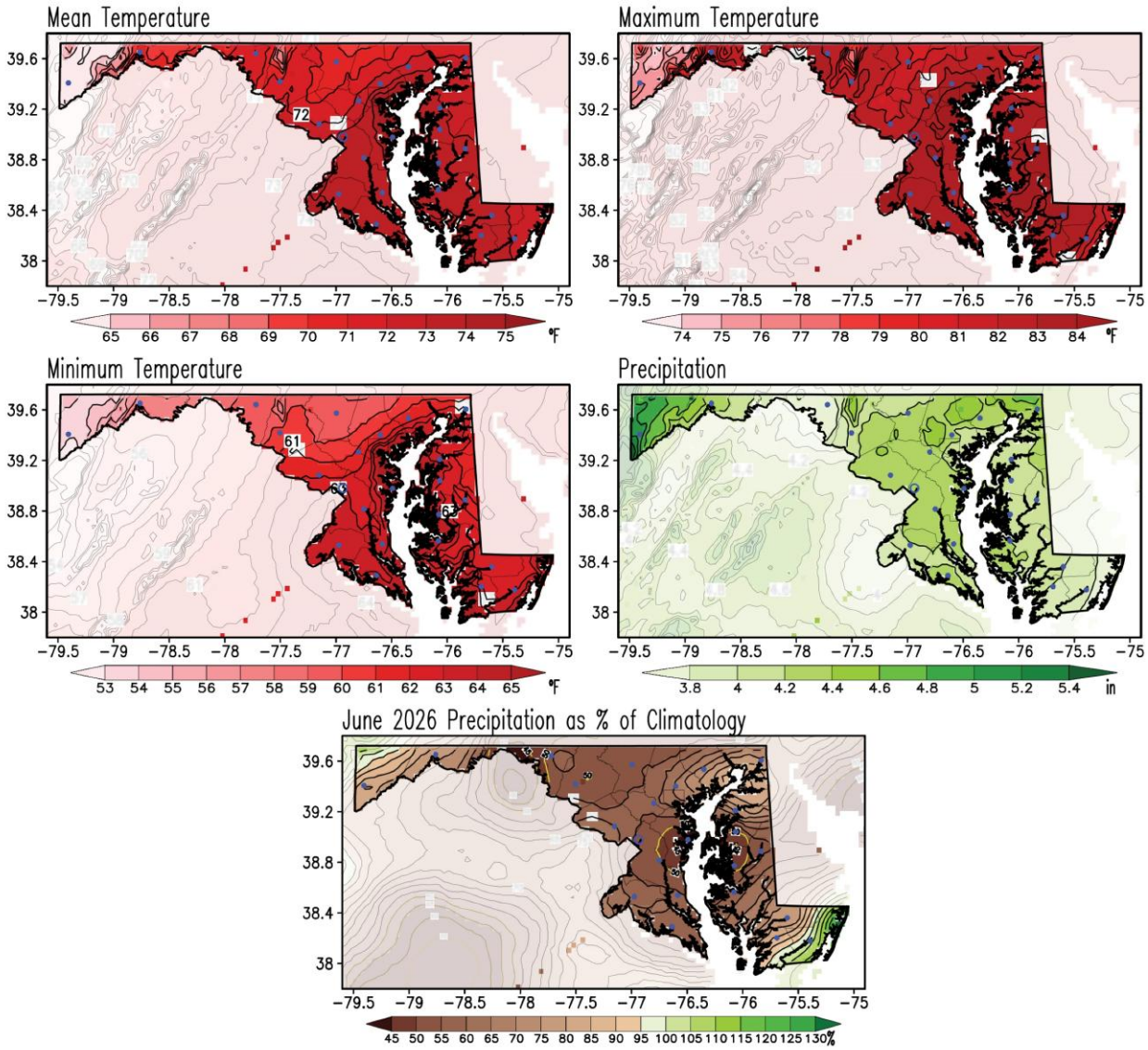

Figure C1. June climatology of the monthly mean, maximum, and minimum surface air temperatures, and total precipitation for the period 1991-2020 (upper and middle rows), and precipitation in June 2026 as a percentage of climatology (bottom row). Temperatures are in °F, and precipitation in inches according to the color bars. This is the current climate normal against which the June 2026 conditions are compared to obtain the June 2026 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, and yellow isolines are for percentages equal to or less than 50%. Note that shading outside the state has been washed out to facilitate focus on Maryland. Filled blue circles mark the county seats.

Appendix D. June Standard Deviation and June 2026 Standardized Anomalies Maps

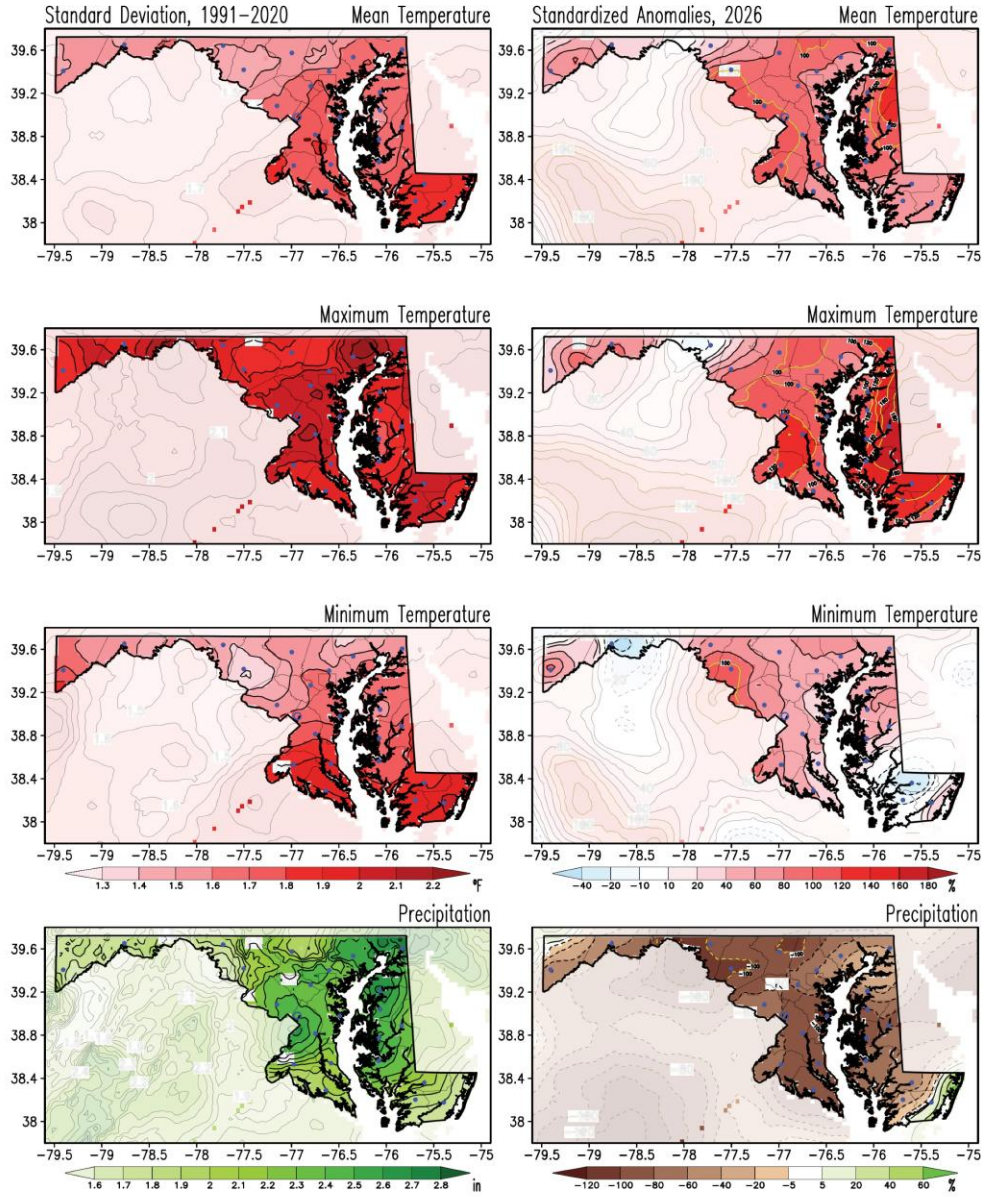

Figure D1. Standard deviation for June and standardized anomalies of temperatures and precipitation for June 2026. Standard deviations for monthly mean, maximum, and minimum surface air temperatures and total precipitation were obtained from the 1991-2020 period (left column). Anomalies for June 2026 (right column) are obtained as a percentage of the standard deviations. The standard deviations for temperature are in °F, and those for precipitation are in inches according to the color bars. Blue/red shading in the anomaly temperature maps marks colder/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 the ratio by 100; hence, the units are in percent (%); yellow isolines highlight anomalies equal to or larger than 1 standard deviation. Note that shading outside the state has been washed out to facilitate focus on Maryland. Filled blue circles mark the county seats.

Appendix E. June 2007-2020 Mean and Standard Deviation of Sea Surface Temperature Maps

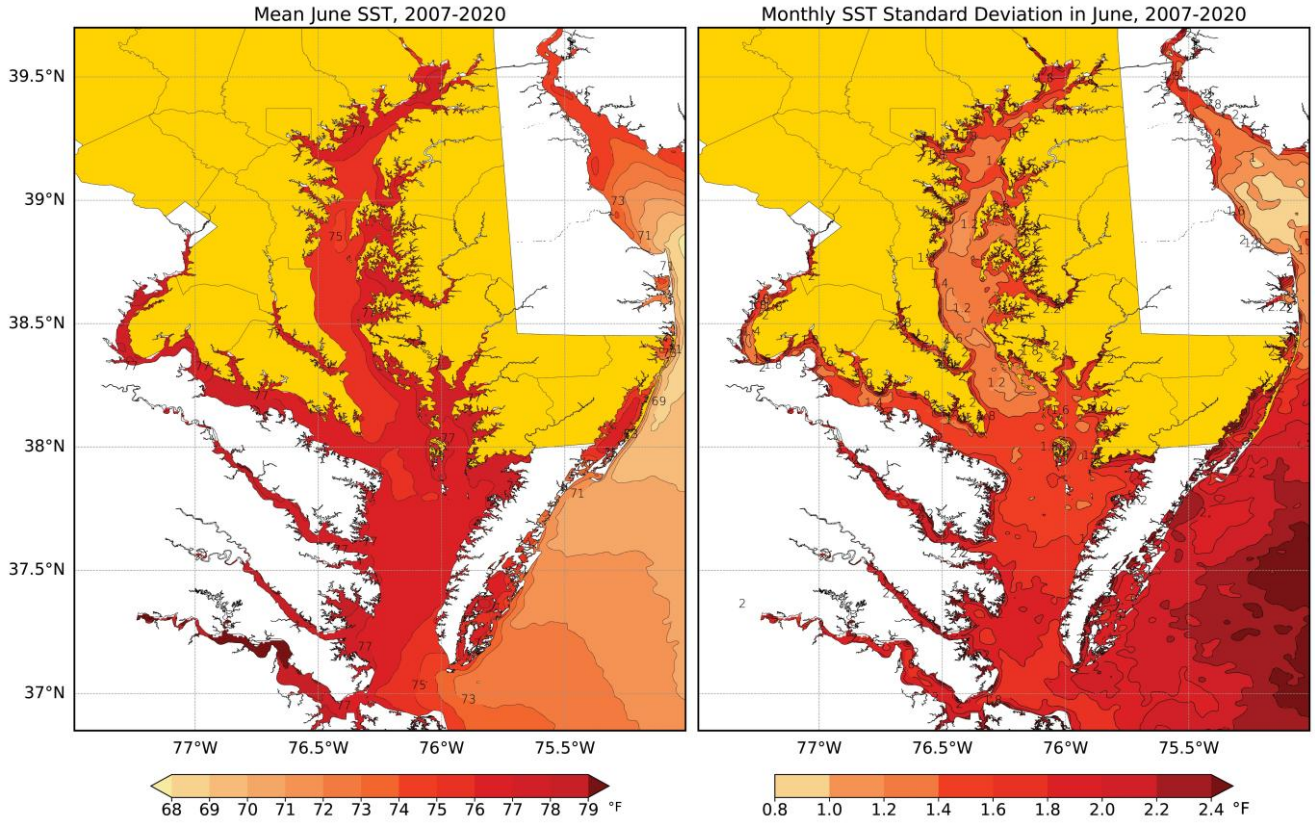

Figure E1. Mean (left panel) and standard deviation (right panel) of sea surface temperatures in the Chesapeake Bay and surrounding coastal areas in June for the period 2007-2020. The mean and standard deviation of the temperatures are in °F according to the color bars. The mean temperature map is the current mean against which June 2026 conditions are compared to obtain June 2026 anomalies (see Figure 14). For clarity, the mean and standard deviation of the temperature have been smoothed using a 9-point spatial smoother, applied four times. To facilitate comparison between the mean June map (left panel) and the June 2026 map (Figure 14, left panel), the shading schemes are the same. Note that Maryland has been shaded yellow to facilitate focus on the state waters.

References

Arguez A., I. Durre, S. Applequist, R. S. Vose, M. F. Squires, X. Yin, R. R. Heim Jr, and T. W. Owen, 2012: NOAA's 1981-2010 U. S. Climate Normals. An Overview. *Bulletin of the American Meteorological Society*. 93, 1687-1697, doi:10.1175/BAMS-D-11-00197.1 https://www1.ncdc.noaa.gov/pub/data/normals/1981-2010/documentation/1981-2010-normals-overview.pdf.

Barriopedro, D., R. García-Herrera, C. Ordóñez, D. G. Miralles, and S. Salcedo-Sanz, 2023: Heat waves: Physical understanding and scientific challenges. Reviews of Geophysics, 61, e2022RG000780. https://doi.org/10.1029/2022RG000780.

CPC, Climate Prediction Center, 2023: Degree Days Explanation. https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/cdus/degree_days/ddayexp.shtml

Durre, I., A. Arguez, C. J. Schreck III, M. F. Squires, and R. S. Vose, 2022: Daily high-resolution temperature and precipitation fields for the Contiguous United States from 1951 to Present. Journal of Atmospheric and Oceanic Technology, doi:10.1175/JTECH-D-22-0024.1

IPAD, 2023. Metadata for Corn https://ipad.fas.usda.gov/cropexplorer/Definitions/csc.htm

Kunkel, K. E., and A. Court, 1990: Climatic Means and Normals—A Statement of the American Association of State Climatologists (AASC), *Bulletin of the American Meteorological Society*, 71(2), 201-204. Retrieved Aug 20, 2022, from https://journals.ametsoc.org/view/journals/bams/71/2/1520-0477-71_2_201.xml

OSU, 2024: The Ohio State Phenology Calendar. https://weather.cfaes.osu.edu/gdd/glossary.asp

Santer, B. D., and co-authors, 2000: Statistical significance of trends and trend differences in layer-averaged atmospheric temperature time series. *J. Geophys. Res.*, 105, 7337–7356, doi:10.1029/1999JD901105.

Tschurr, F., I. Feigenwinter, A. M. Fischer, and S. Kotlarski, 2020: Climate Scenarios and Agricultural Indices: A Case Study for Switzerland. Atmosphere, 11, 535. https://doi.org/10.3390/atmos11050535

Vose and co-authors, 2014: NOAA Monthly U.S. Climate Gridded Dataset (NClimGrid), Version 3. *NOAA National Centers for Environmental Information*. DOI:10.7289/V5SX6B56.

WMO, 2017: WMO Guidelines on the Calculation of Climate Normals. WMO-No. 1203, Series. 29pp. https://library.wmo.int/doc_num.php?explnum_id=4166.