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Maryland Climate Bulletin
Fall 2025

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DEPARTMENT OF
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OCEANIC SCIENCE
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Maryland
State
Climatologist
Office

Summary

Fall 2025 was drier and slightly warmer than normal (i.e., 1991-2020 averages) in Maryland, with drier- and slightly warmer-than-normal conditions in November, drier- and slightly colder-than normal conditions in October, and drier- and warmer-than-normal conditions in September. Regionally, fall mean temperatures were between 50 and 60°F, maximum temperatures were in the 60−70°F range, and minimum temperatures were between 38 and 53°F. Seasonal accumulated total precipitation was in the 4.4−9.2 inches range.

Maryland Regional Features (Figures 1-5, C1, and E1)

- The mean temperature was warmer than normal over most of the state, particularly over Garrett County (0.8−1.0°F), and Montgomery, Frederick, Carroll, and Howard counties (0.6−0.8°F). On the other hand, colder-than-normal temperatures developed over southern Maryland on both sides of the Bay, especially in Somerset and Worcester counties (0.4–0.6°F below).

- The maximum temperature was also warmer than normal over much of the state, notably over Garrett County (1.4−1.6°F), as well as over Montgomery, Frederick, Carroll, and Howard counties (1.0−1.2°F). Conversely, colder-than-normal temperatures emerged, especially in Worcester County (1.0–1.2°F below normal) as well as in the central and southern Eastern Shore, and southern Saint Mary's and Calvert counties.

- The minimum temperature had warmer- and colder-than-normal areas throughout the state, too. Warmer-than-normal temperatures appeared especially over Montgomery, Frederick, Carroll, and Worcester counties (0.6−0.8°F), and northern Harford and Cecil counties (0.4−0.6°F). In contrast, colder-than-normal temperatures emerged, especially over southern Garrett and western Washington counties (0.6–0.8°F below), and Prince George's, Charles, Saint Mary's, and Somerset counties.

- Precipitation was below normal in the entire state, particularly in Montgomery, Frederick, and Carroll counties (5.6−6.4 inches deficit), Harford, Kent, and Queen Anne's counties (5.2−6.0 inches deficit), and Washington County (4.8−5.6 inches deficit). Among these regions, fall precipitation over northern Montgomery, Frederick, and southern Washington counties was 50 to 58% lower than its climatological seasonal precipitation, and precipitation over the western tip of Charles County, southern Harford, Kent, and Queen Anne's counties was 50% lower. In other regions, such as the central and southern coastal plains, rainfall was 38 to 42% below normal; Garrett and Allegany counties received 30 to 38% less, and Somerset and Worcester counties received between 18% and 34% less rainfall than normal.

- The 2025 water year (October 2024 − September 2025) was below normal over most of the state, notably over Frederick, Carroll, and Montgomery counties (8−12 inches deficit), and parts of Harford, Kent, and Queen Anne's counties (9−11 inches deficit). The region over Frederick received 21−27% less than their climatological water amount, while the region over Kent and Queen Anne's got 21−24% less. Conversely, above-

normal water amounts emerged over Garrett County (1−3 inches), which received between 3 and 6% more than its climatological water amount.

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

- All eight climate divisions experienced drier-than-normal conditions during fall 2025, with Climate Divisions 4 to 8 being warmer than normal, and Climate Divisions 1 to 3 being colder than normal. Climate Division 6, North Central, largely the Piedmont, had the largest departure from normal precipitation (|−5.49| inches deficit), and Climate Division 1, Southeastern Shore, to the southeast of the Bay, had the smallest departure (|−3.50| inches deficit). Climate Division 8, the Allegheny Plateau, had the largest mean temperature departure from normal (0.7°F), while Climate Division 3, Lower Southern, had the smallest (|−0.1|°F below).

- Seasonally, statewide anomalies have been getting colder and drier since spring. The mean temperature anomalies in fall 2025 were slightly warmer than normal (0.2°F), following a warmer-than-normal summer (0.7°F), and a much warmer-than-normal spring (3.1°F). Statewide precipitation anomalies in fall 2025 were much below normal (4.74 inches deficit), after conditions were drier than normal in summer (1.35 inches deficit), and a wetter-than-normal summer (2.59 inches).

Historical Context (Figure 8, Tables A1 and A2)

- Fall 2025's statewide mean, maximum, and minimum temperatures (57.4, 67.6, and 47.1°F) were above their long-term (1895-2024) averages (56.3, 66.7, and 45.8°F). Except for the maximum temperature, the mean and minimum temperatures were within 25% of their warmest values on record. However, the mean, maximum, and minimum temperatures were far from their warmest records of 60.4, 70.9, and 50.4°F, established in 1931, 1931, and 2018, respectively. The statewide precipitation for fall 2025 (6.57 inches) was below the long-term average (9.90 inches) and within the 25% of its driest values, but far from the driest fall on record, which was 3.51 inches in 1931.

- Statewide mean, maximum, and minimum temperatures indicated that fall 2025 was the thirty-third, thirty-eighth, and thirtieth warmest fall since 1895, respectively.

- Statewide precipitation showed that fall 2025 was the fifteenth driest fall on record. Among the counties, this fall was the seventh driest for Montgomery, the eighth for Frederick, and the tenth for Washington since 1895.

Century-Plus Trends, 1895-2025 (Figures 9, 10)

- Statewide mean temperature, heating degree days, and precipitation in fall, and the complete water year (October to September) showed significant trends: a warming trend

(1.8°F/century), a decreasing heating trend (−143.9°FDD/century), a wetting trend (2.04 in/cent), and an increasing water trend (2.79 in/century), respectively.

- Regionally, fall mean temperatures showed significant warming trends everywhere in the state. The largest trends were identified over Baltimore City and southern Baltimore County (2.4−2.6°F/century), the urban corridor from southern Montgomery, western Charles, and northern Prince George's and Anne Arundel counties to central Baltimore and northern Harford counties (2.0−2.2°F/century), and over the Eastern Shore (1.8−2.0°F/century).

- Regionally, accumulated total precipitation in fall displayed significant wetting trends in the entire state. The largest trends were found over central Baltimore County (2.8−3.0 in/century). Slightly smaller trends (2.4−2.8 in/century) are found in the rest of the Piedmont and Charles, Calvert, and Saint Mary's counties. The rest of the state has wetting trends in the 1.2−2.2 in/century range.

Chesapeake Bay Sea Surface Temperatures (Figures 11, 12, F1)

- Sea surface temperatures in the Chesapeake Bay in fall 2025 were in the 63–68°F range. Regionally, temperatures were below their 2007-2020 mean over the majority of the Bay, especially in the Lower Basin (including the Patuxent and Potomac rivers) from the Tangier and Pocomoke Sounds (1.5−2.7°F below), the mouth of the Choptank river (0.9−2.1°F below) to the southern half of the Middle Basin (0.3−0.6°F below). Temperatures warmer than the 2007-2020 mean emerged largely in the northeastern half of the Middle Basin and the Upper Basin (0.9−1.5°F). The waters off Worcester County's Chincoteague Bay were also colder than the mean (1.5–2.1°F below). The fall 2025 all-basin mean temperature of 65.0°F was below the 19-year (2007−2025) mean of the dataset (66.3°F) but still far from the coldest fall temperature of 64.1°F, set in 2012.

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. This is the seasonal version of the bulletin.

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 seasonal surface climate conditions, situating them within the context of regional and continental climate variability and change, to help Marylanders interpret and understand recent climate conditions.

The seasonal surface climate conditions for fall 2025 are presented via maps of key variables, such as average surface air temperature, maximum surface air temperature, minimum surface air temperature, accumulated total precipitation, and their anomalies (i.e., departures from normal); they are complemented by the water year conditions for the state in Section 3. Statewide and climate division averages for the season are compared using scatter plots in Section 4. The seasonal statewide averages are placed in the context of the historical record via box and whisker plots in Section 5. Century-plus trends in statewide air temperature, heating degree-days, accumulated total precipitation, water year, and state maps of air temperature and accumulated total precipitation are presented in Section 6. Seasonal sea surface temperatures (SST) in the Chesapeake Bay are presented in Section 7. Ancillary statewide, climate division, and county-level information is provided via tables and plots in Appendices A and B; climatology and variability maps are included in Appendices C-E; mean and variability of the sea surface temperatures in the Chesapeake Bay are displayed in Appendix F.

2. Data & Methods

Surface air temperatures, total precipitation, and heating 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 from 1895 to the present at: https://www.ncei.noaa.gov/data/nclimgrid-monthly/access/
  Data was downloaded on December 9, 2025.

- NOAA Monthly U.S. Climate *Divisional* Dataset (NClimDiv – Vose et al., 2014). It is available in a preliminary status from 1895 to the present (v1.0.0-20251204) at: https://www.ncei.noaa.gov/pub/data/cirs/climdiv/
  Data was downloaded on December 9, 2025.

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 product acquired is the monthly sea surface temperatures for the Chesapeake and Delaware Bays, with a nominal horizontal resolution of 750 m. Please be advised that although a seasonal resolution version of the data set exists at the East Coast Node, for consistency with the analysis of surface atmospheric parameters in this Bulletin, the monthly version was preferred to derive the seasonal version of the data set in-house, as the seasonal resolution of the data at the East Coast Node was obtained from daily resolution data. It is available from 2007 to the present at:
  https://eastcoast.coastwatch.noaa.gov/data/avhrr-viirs/sst-ngt
  Data was downloaded on December 2, 2025.

- 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. It is available at:
  https://data.imap.maryland.gov/datasets/maryland::maryland-watersheds-8-digit-watersheds/about

Some definitions:

About the seasons: Seasons are defined following the common three-month meteorological definitions. Spring includes March, April, and May; summer includes June, July, and August; fall includes September, October, and November; and winter includes December, January, and February. Seasonal temperatures are calculated as the mean of the temperatures in the three months, while seasonal precipitation and degree days are calculated as the sum of their values over the three months, which in turn were obtained by summing their daily values.

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 sufficiently long, we can begin 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 19 years, from 2007 to the present, which prevents the calculation of its current climate normal (1991-2020). In this case, a 2007-2020 mean is used as a base of comparison in the calculation of anomalies. This will be referred to as the 2007-2020 mean and not as a climatology.

About the anomalies: Anomalies for a given season (e.g., fall 2025) are the departures of the seasonal value from the corresponding climatology; in this case, the 1991-2020 climatology. When the observed seasonal 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 seasonal standard deviation of a climate variable measures its dispersion relative to its seasonal 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 degree days. Degree days are 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 obtain a general idea of the 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).

About the water year. The water year is the sum of total precipitation from October 1st to September 30th of the following year and is labeled by the year in which the measurements end. Therefore, the water year 2025 started in October 2024 and ended in September 2025. Total precipitation for the entire water year reflects both winter snow accumulation and summer rainfall. Precipitation that falls during a water year reflects the amount of water that will contribute to actual stream flow and groundwater inputs for that year.

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. Fall 2025 Maps

A. Mean Temperatures

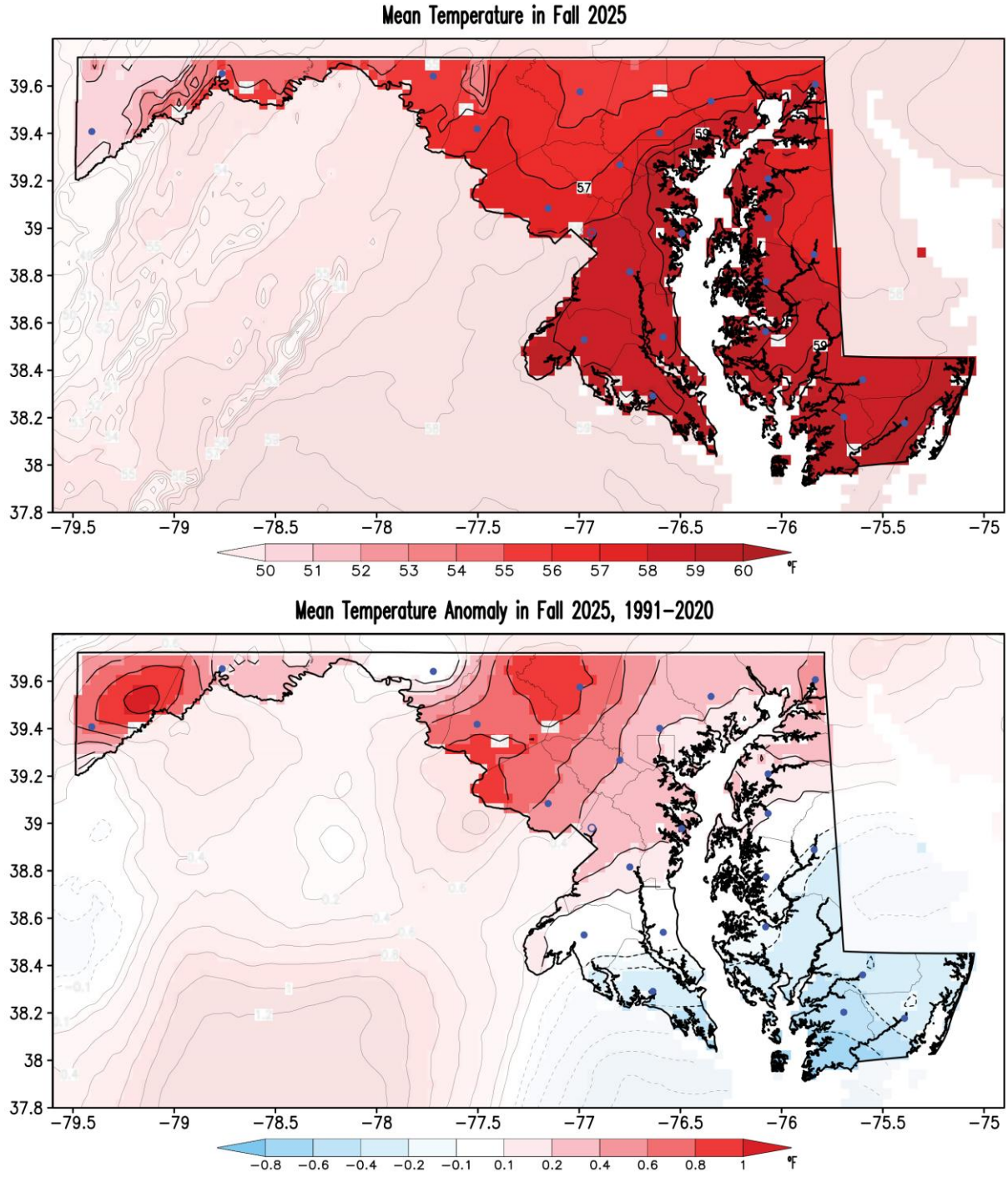

Figure 1. Seasonal mean surface air temperature (top panel) and its anomaly with respect to the 1991-2020 climatology (bottom panel) for fall 2025. Temperatures are in °F following the color bar. Blue/red shading in the anomaly map marks colder/warmer-than-normal conditions. Note shading outside the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

B. Maximum Temperatures

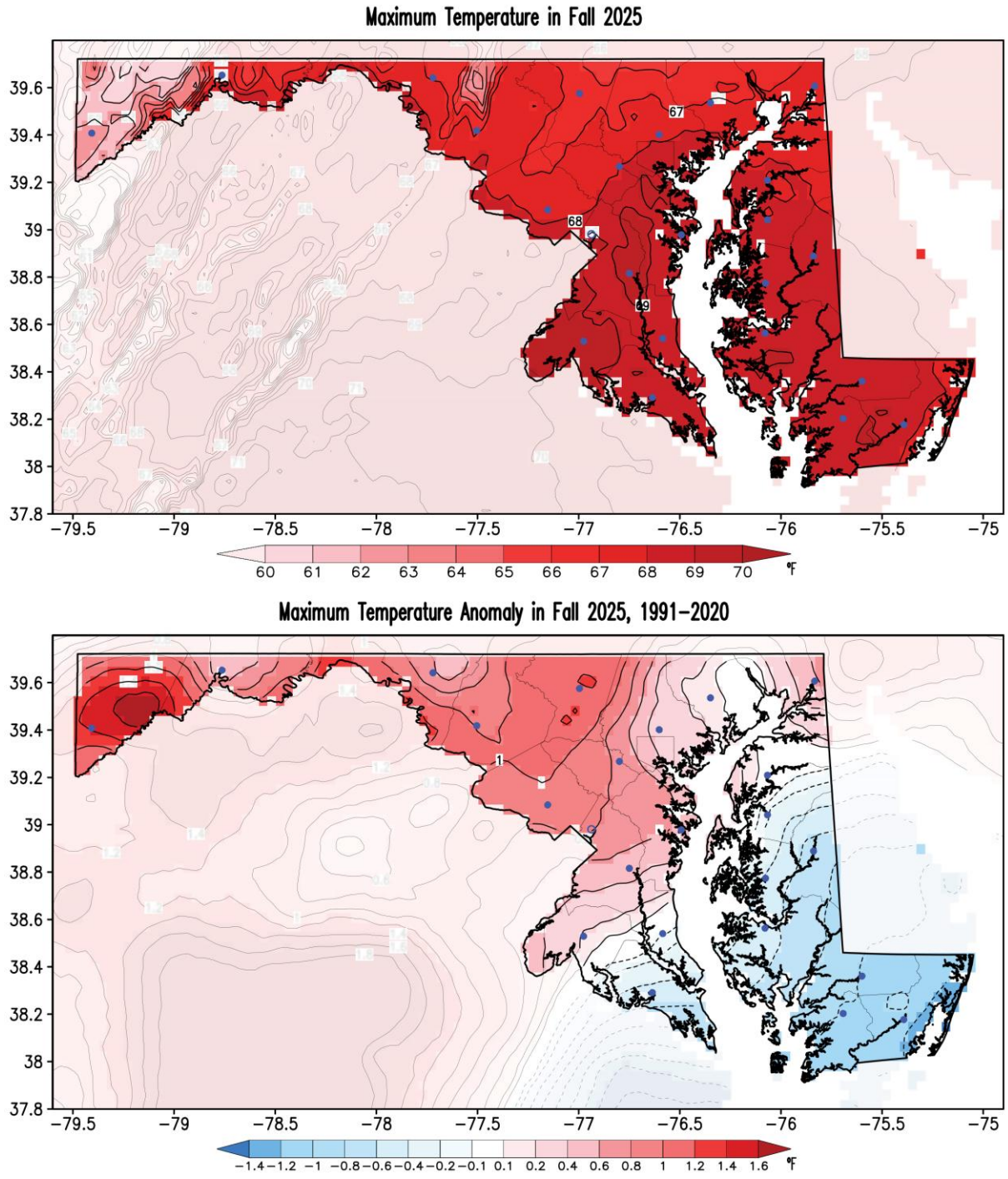

Figure 2. Seasonal maximum surface air temperature (top panel) and its anomaly with respect to the 1991-2020 climatology (bottom panel) for fall 2025. Temperatures are in °F following the color bar. Blue/red shading in the anomaly map marks colder/warmer-than-normal conditions. Note shading outside the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

C. Minimum Temperatures

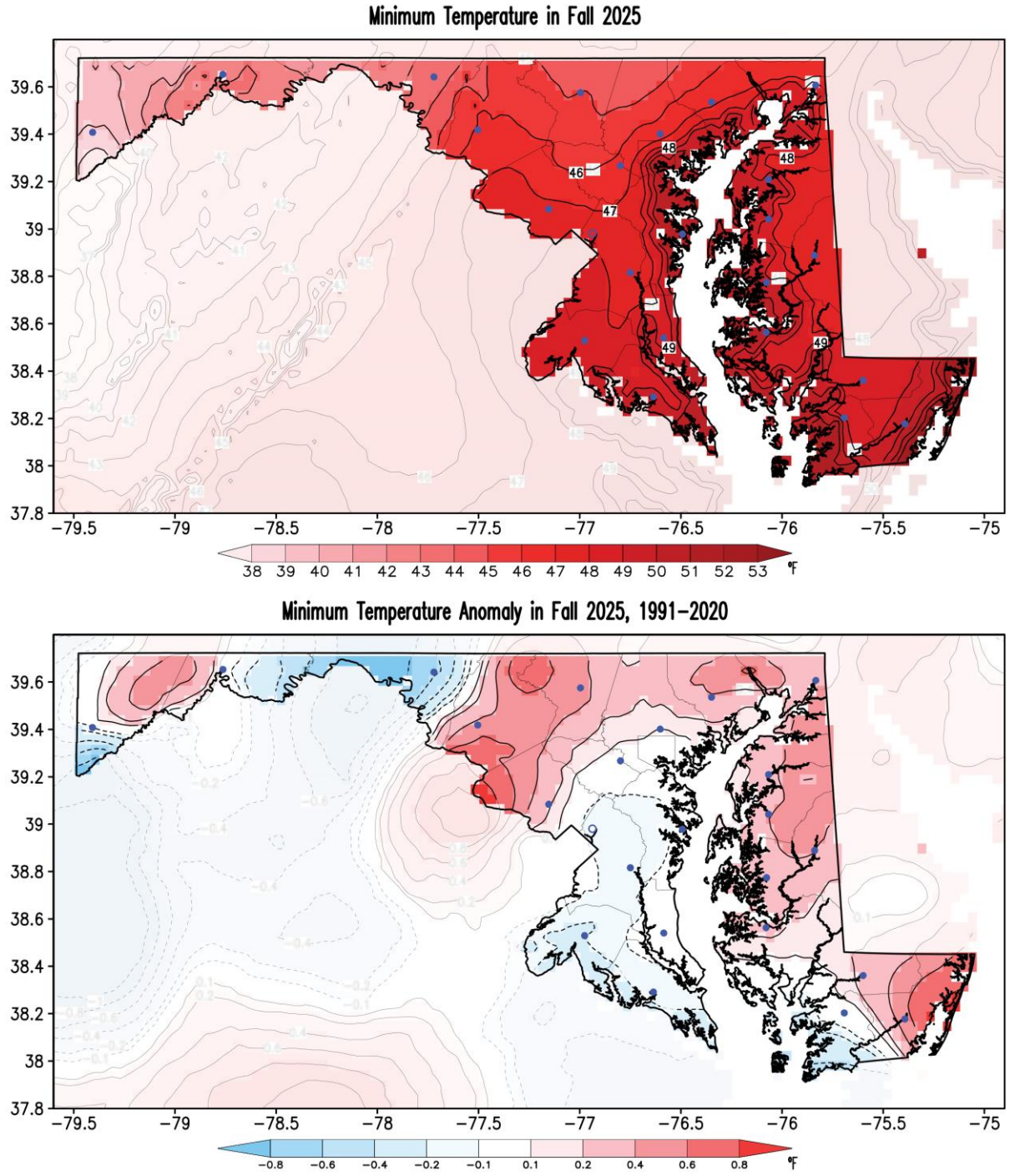

Figure 3. Seasonal minimum surface air temperature (top panel) and its anomaly with respect to the 1991-2020 climatology (bottom panel) for fall 2025. Temperatures are in °F following the color bar. Blue/red shading in the anomaly map marks colder/warmer-than-normal conditions. Note shading outside the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

D. Precipitation

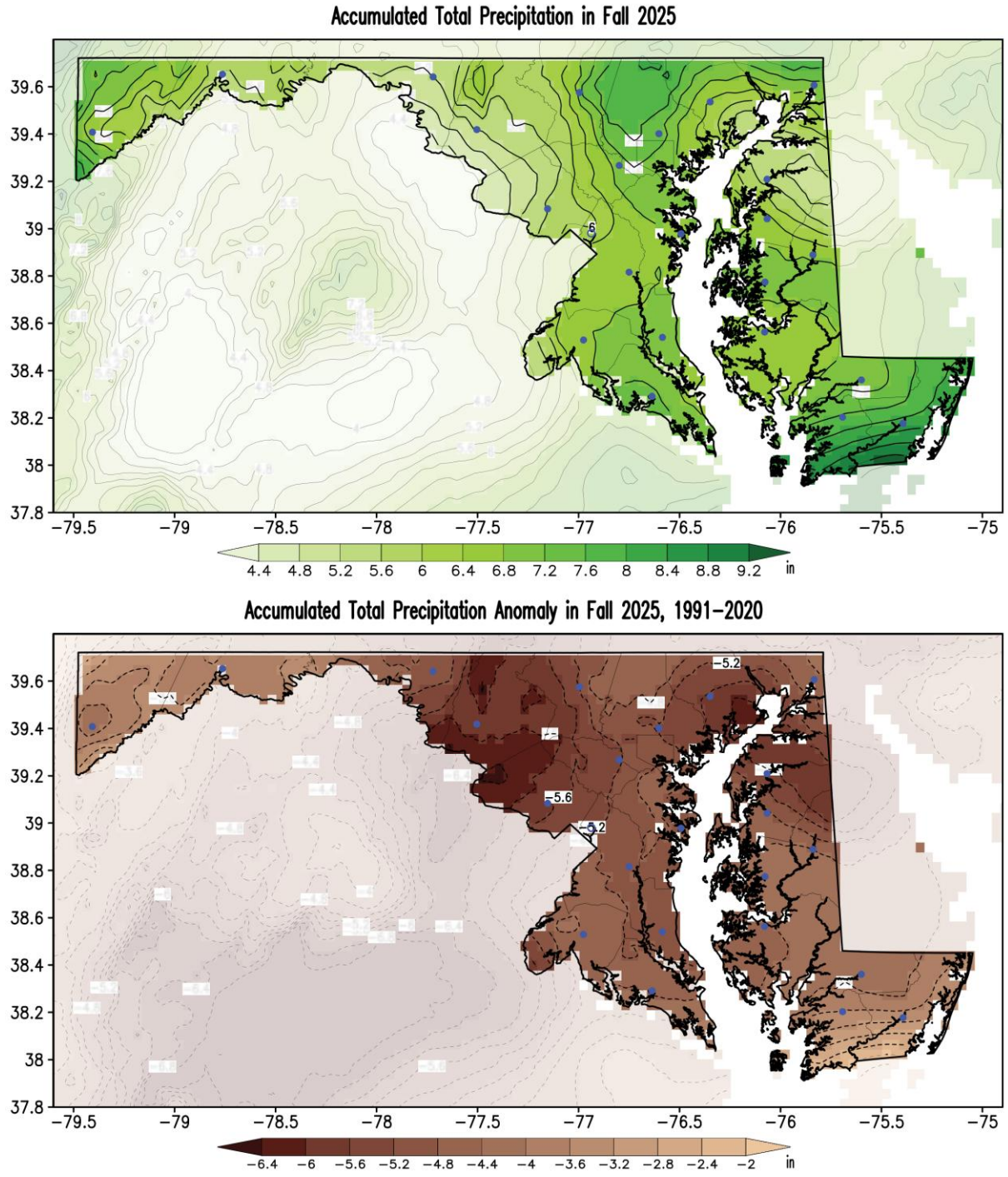

Figure 4. Seasonal accumulated total precipitation (top panel) and its anomaly with respect to the 1991-2020 climatology (bottom panel) for fall 2025. Precipitation is in inches following the color bar. Brown shading on the anomaly map indicates drier-than-normal conditions. Note shading outside the state has been washed out to facilitate focus on Maryland. Filled blue circles mark the county seats.

E. Water Year (October 2024 – September 2025)

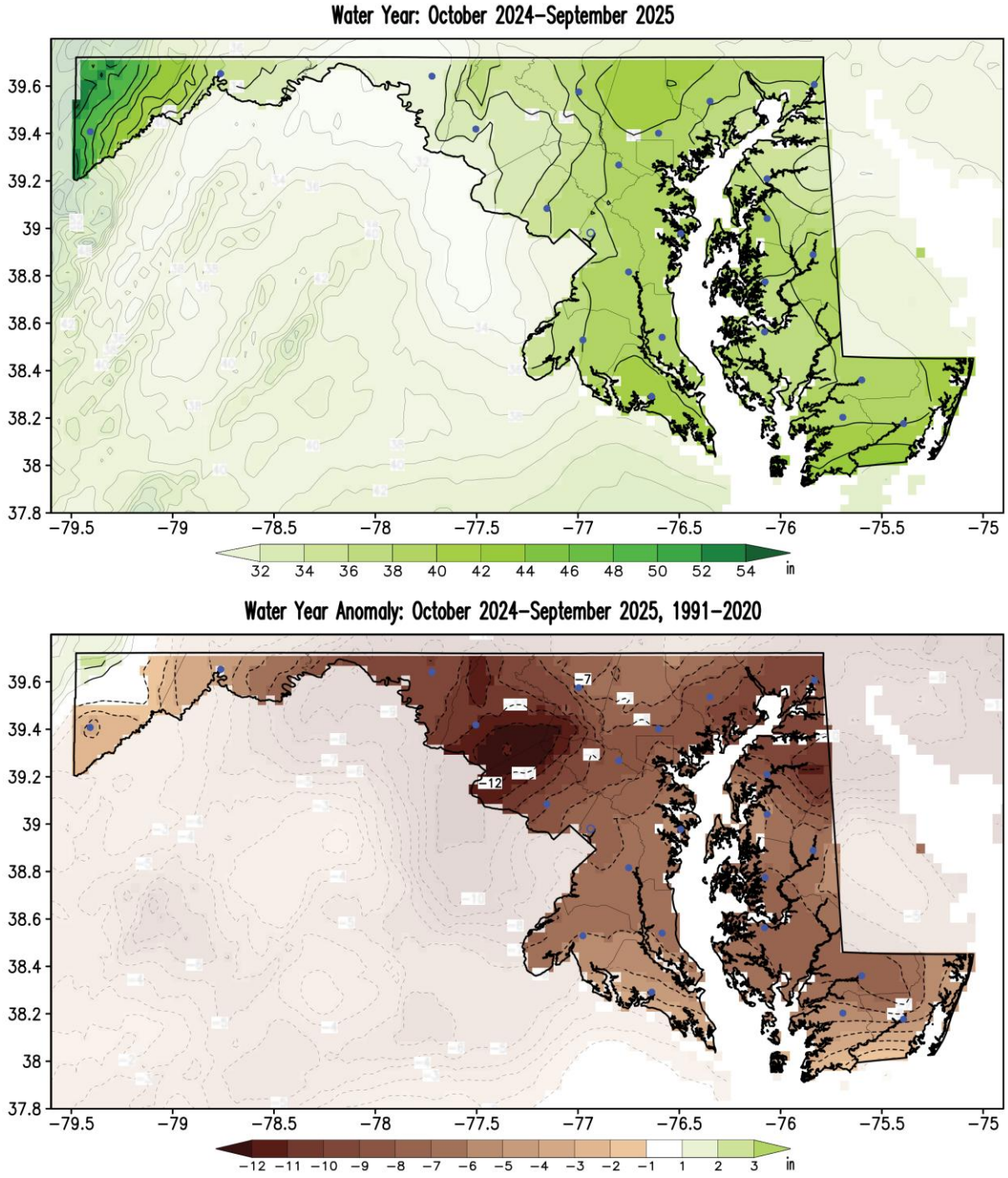

Figure 5. The water year 2025 (top panel), and its anomaly with respect to the 1991-2020 climatology (bottom panel). Water year is in inches following the color bar. Brown/green shading in the anomaly map marks drier/wetter-than-normal conditions. The current maps display the conditions from October 2024 to September 2025, that is, the complete water year of 2025. Note shading outside the state has been washed out to facilitate focus on Maryland. Filled blue circles mark the county seats.

4. Fall 2025 and Spring – Fall 2025 Climate Divisions Averages

A. Fall 2025 Scatter Plots

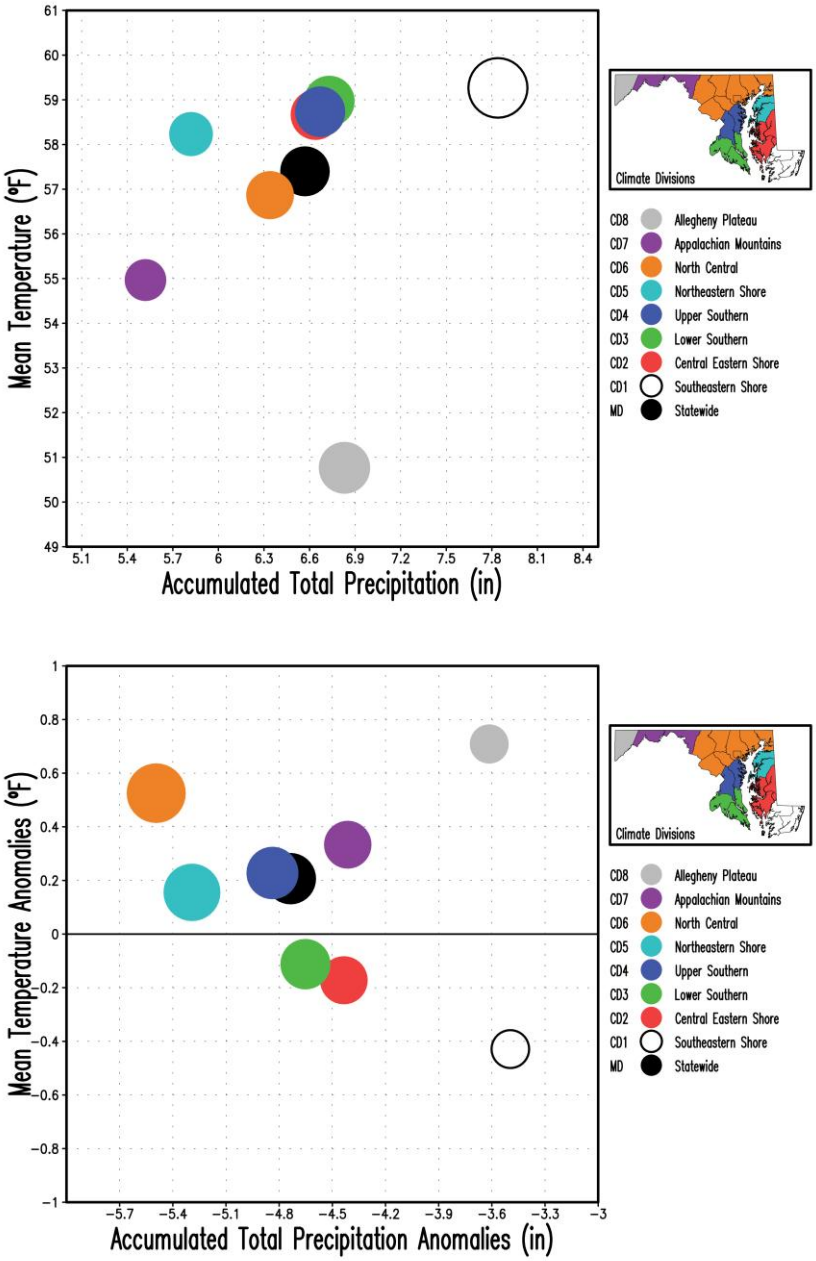

Figure 6. Scatter plots of Maryland (statewide) and Climate Divisions (CD#) seasonal mean surface air temperature vs. accumulated total precipitation for fall 2025. The upper panel shows the mean temperature and total precipitation, and the bottom panel displays their anomalies with respect to the 1991-2020 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 (7.84 inches in CD1, top panel) and by the maximum precipitation anomaly (|−5.49| inches in CD6, bottom panel) among the nine regions. Note that the color of the filled circles corresponds to the color of the Climate Divisions on the inset map.

B. Spring to Fall 2025 Scatter Plots

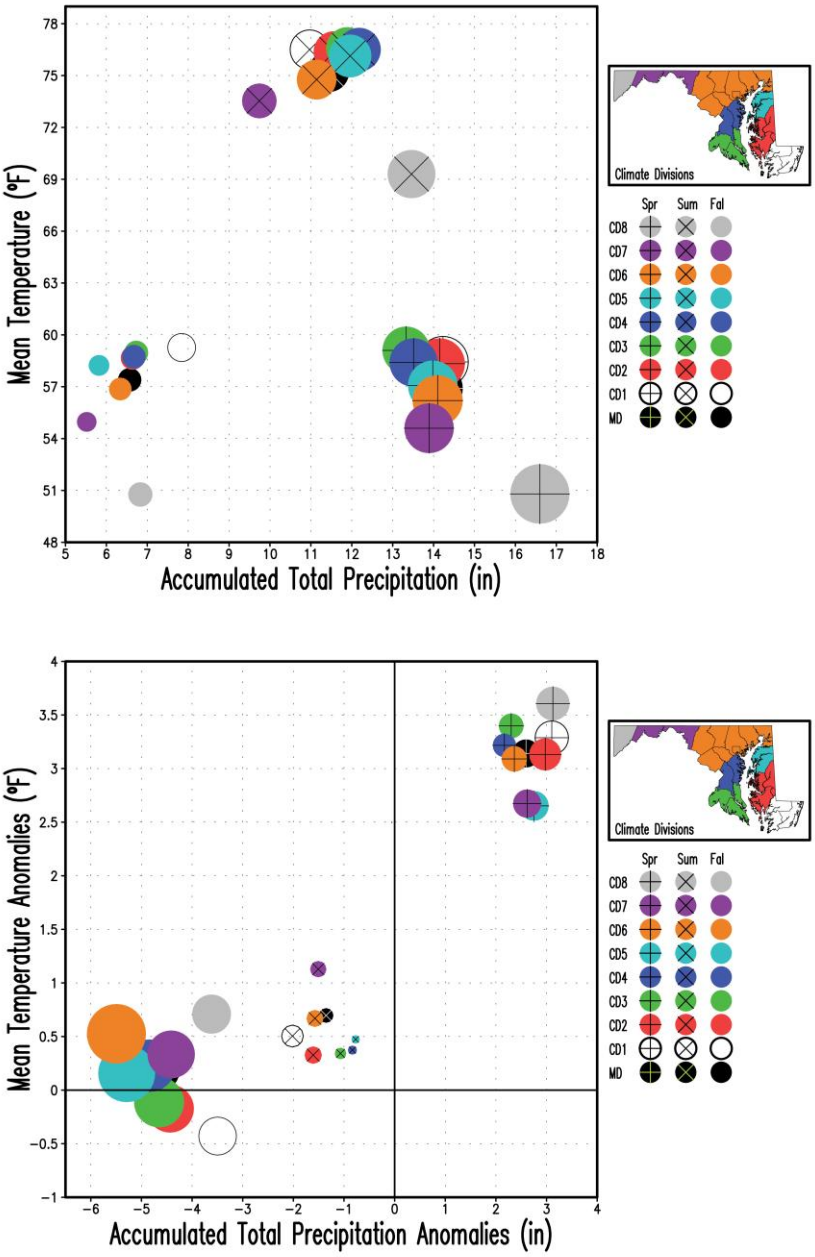

Figure 7. Scatter plots of Maryland (statewide) and Climate Divisions (CD#) seasonal mean surface air temperature vs. accumulated total precipitation for spring, summer and fall 2025. The upper panel shows the mean temperature and total precipitation, and the bottom panel displays their anomalies with respect 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 (16.60 inches in CD8 in spring, top panel) and by the maximum precipitation anomaly (|–5.49| inches in CD6 in fall, bottom panel) among the nine regions and three months. Fall 2025 is displayed with filled circles only, while summer and spring are displayed with superposed multiplication and addition signs, respectively.

5. Fall 2025 Statewide Averages in the Historical Record

A. Box and Whisker Plots

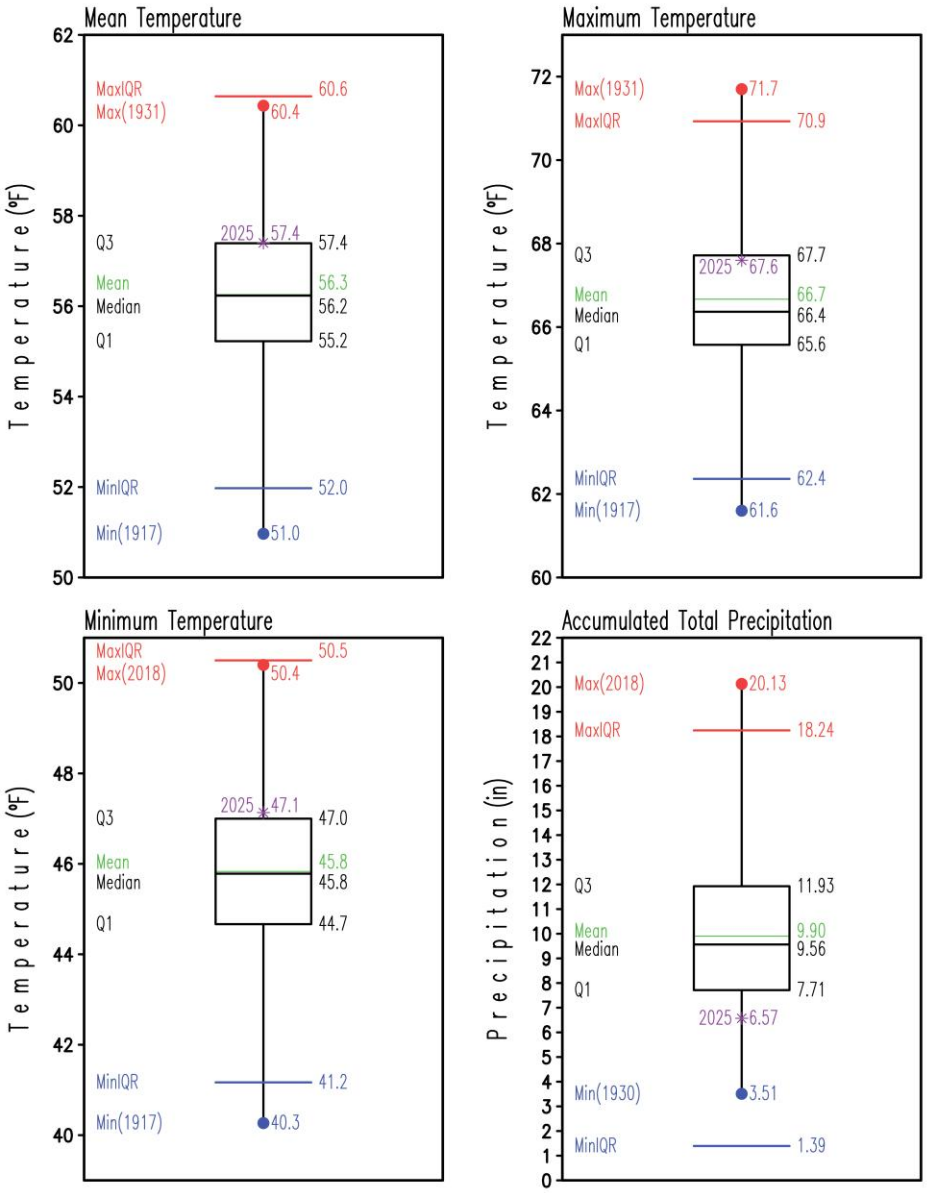

Figure 8. Box and Whisker plots of Maryland (statewide) seasonal mean (upper left), maximum (upper right), minimum (lower left) surface air temperatures, and accumulated total precipitation (lower right) for fall for the period 1895-2024. Conditions for fall 2025 are represented by the label and asterisk in purple. 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 smaller and larger values are the lower and upper horizontal black lines of the box, respectively. 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×(Q3-Q1) and Q3+1.5×(Q3-Q1), respectively.

6. 1895-2025 Trends

A. Statewide Mean Temperature, Heating Degree-Days, Accumulated Total Precipitation, and Water Year

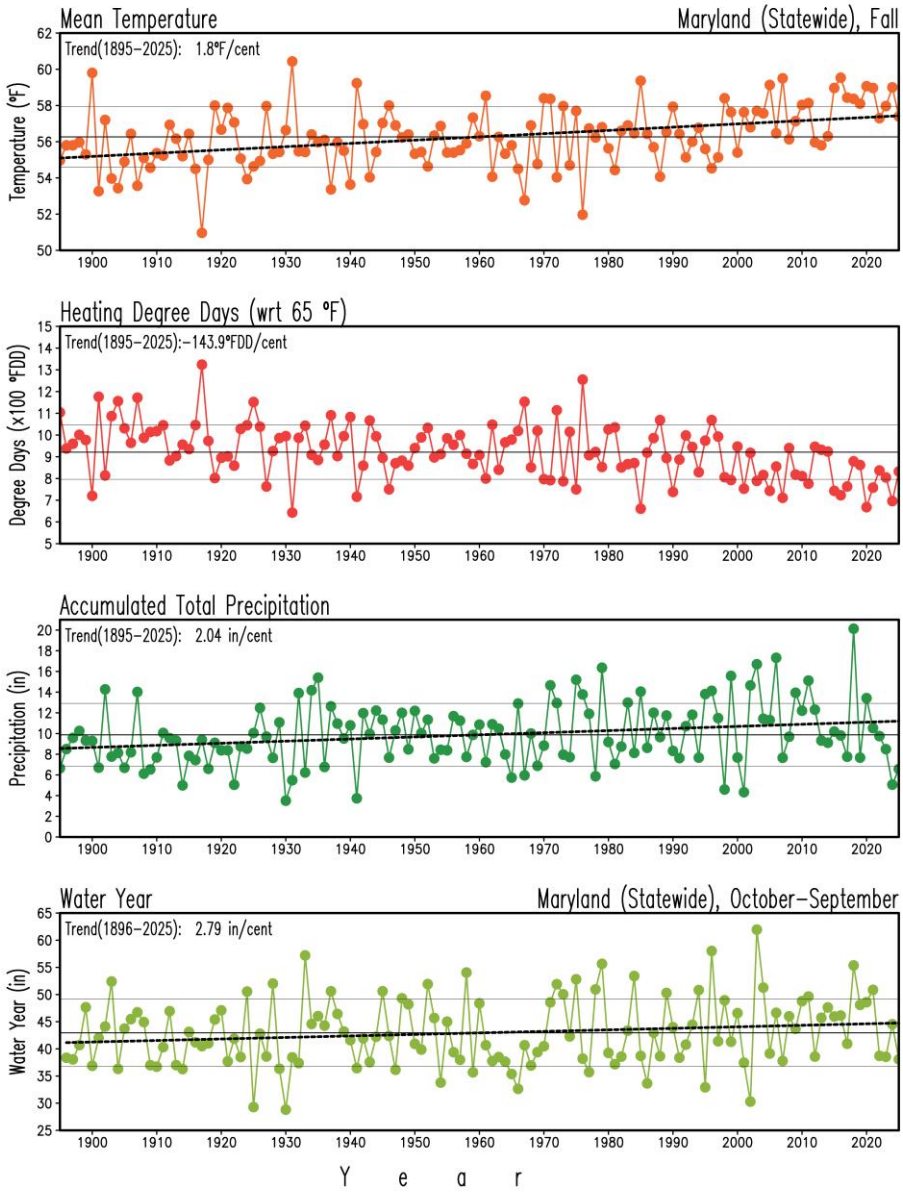

Figure 9. Maryland (statewide) mean surface air temperature, heating degree-days, accumulated total precipitation in fall, and complete water year (i.e., October – September) for the period 1895-2025. Temperature is in °F, heating degree-days is in °F degree-days (°FDD), and precipitation and water year are in inches. The thin, continuous black lines in each panel display the long-term means (56.3°F, 921.3°FDD, 9.88 in, and 42.95 in, 1895-2025), and the double thin, continuous gray lines indicate the standard deviation (1.7°F, 125.0°FDD, 3.04 in, and 6.20 in) above/below the long-term mean. The thick dashed black lines show the long-term linear trends. The warming temperature trend (1.8°F/century), the decreasing heating degree-days trend (−143.9°FDD/century), the wetting precipitation trend (2.04 in/century) and the increasing water year trend (2.79 in/century) are all statistically significant at the 95% level (*Student's t-test* −Santer et al. 2000).

B. Temperature and Precipitation Maps

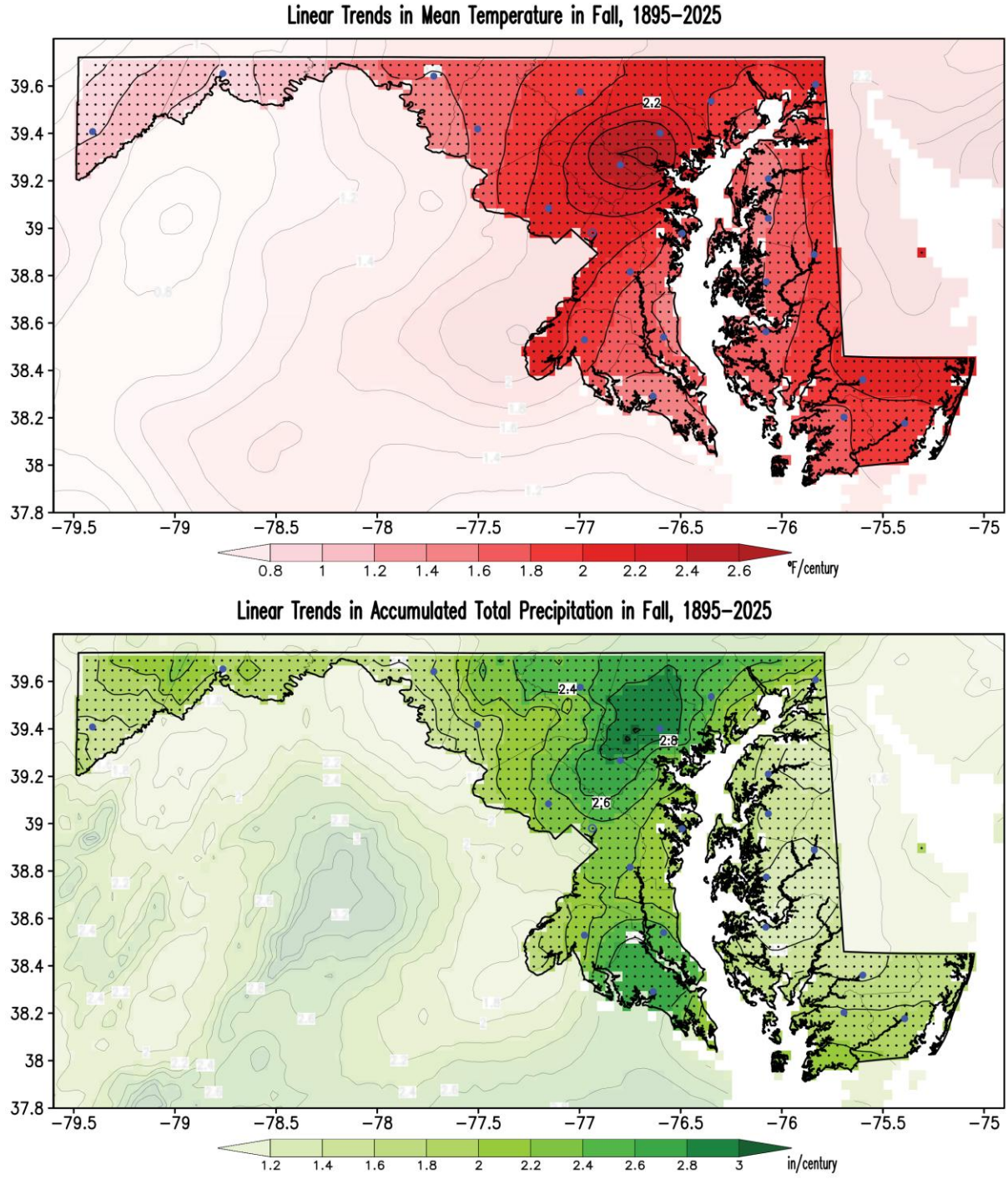

Figure 10. Linear trends in fall surface air mean temperature and accumulated total precipitation for the period 1895-2025. Temperatures are in °F/century, and precipitation is in inches/century following the color bars. Red shading in the temperature map marks warming trends. Green shading in the precipitation map shows wetting trends. Stippling in the maps shows 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.

7. Chesapeake Bay's Satellite Sea Surface Temperatures

A. Maps

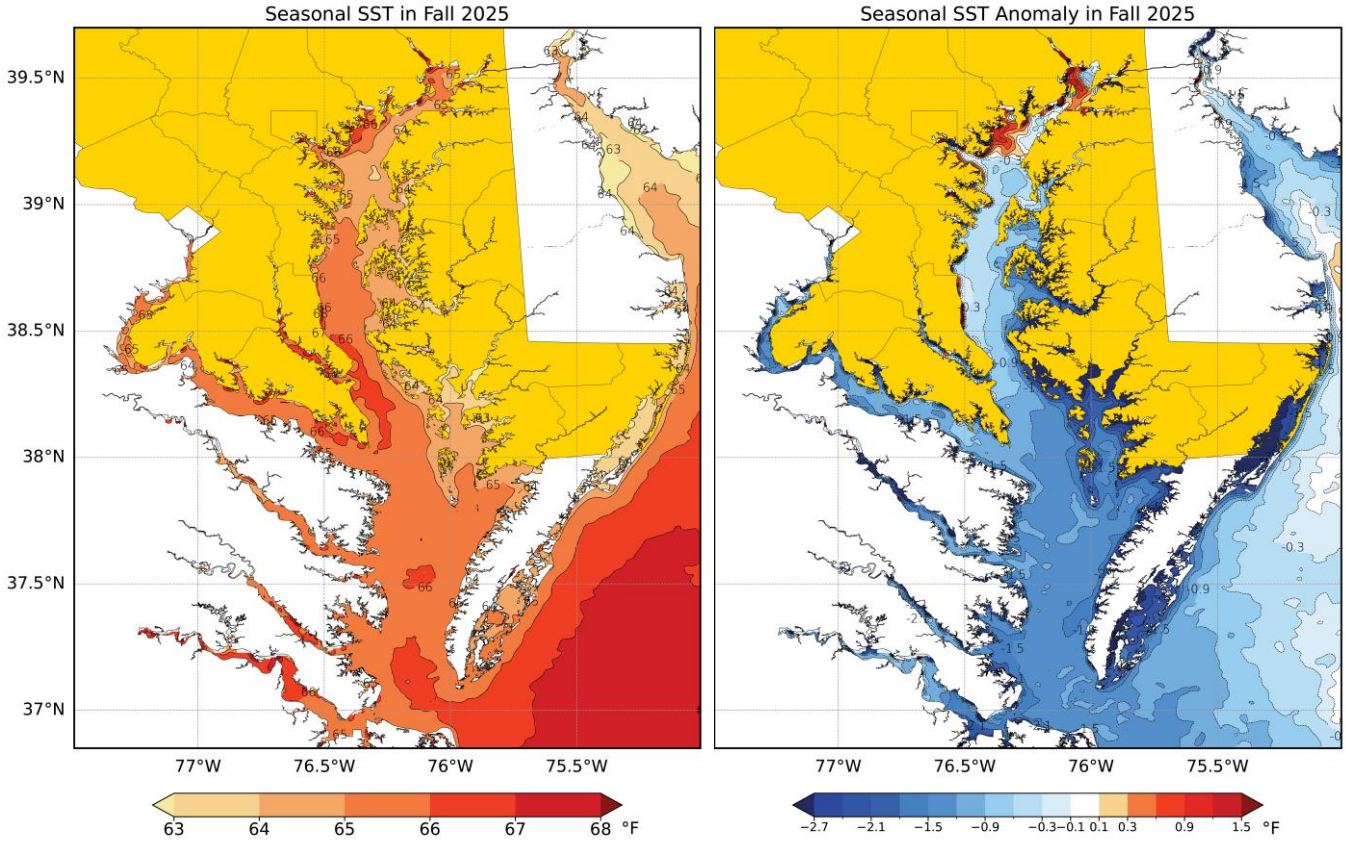

Figure 11. Seasonal sea surface temperature (left panel) and its anomaly (right panel) in the Chesapeake Bay and surrounding coastal areas in fall 2025. Temperatures are in °F following the color bar. Blue/orange shading in the anomaly map marks colder/warmer temperatures than the 2007-2020 mean. For 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. Be aware that the NOAA Chesapeake Bay Office (NCBO) develops seasonal summaries of water quality parameters in the Chesapeake Bay, and that a map of seasonal sea surface temperature anomalies using the same multi-sensor satellite set is also included. Differences with the NCBO's map arise due to differences in the units (°F here vs. °C there), in the mean to be subtracted from the temperatures of the season (2007-2020 here vs. 2007-2024 there), the spatial smoothing here (and none there), and the way the seasonal temperatures are obtained (from monthly temperature here vs. daily temperatures there).

B. Upper, Middle, Lower, and Entire Basins Averages

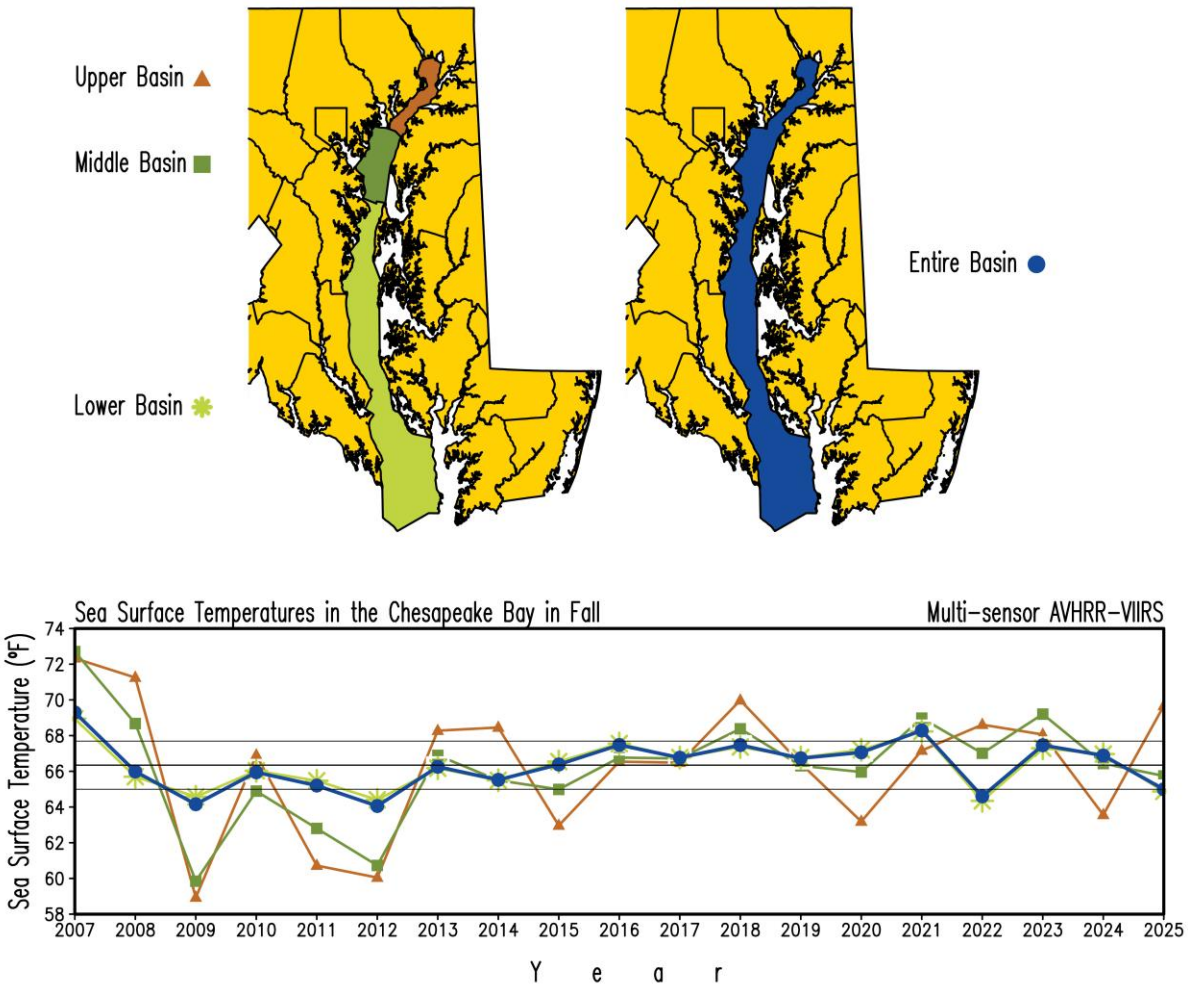

Figure 12. Watersheds in the Chesapeake Bay (top panel) and their area-averaged sea surface temperatures in fall for the period 2007-2025 (bottom panel). Temperatures are in °F. The color of the lines corresponds to the color of the watersheds in the Bay, as indicated on the maps: Brown for the Upper 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 fall 2025 was 65.0°F, while for the Upper, Middle, and Lower basins was 69.7, 65.7, and 64.9°F, respectively. The thin, continuous black line in the lower panel displays the 2007-2025 mean for the Entire Basin (66.3°F), and the double thin, continuous gray lines indicate the standard deviation (1.3°F) above/below the long-term mean. The 2007-2025 mean temperatures for the Upper, Middle, and Lower basins in fall were 66.3, 66.2, and 66.4°F, respectively, while their standard deviations were 3.7, 2.9, and 1.3°F, respectively. For consistency with the analysis of the atmospheric variables, the seasonal time series are obtained from the monthly time series.

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

A. Mean Temperature and Precipitation

Region	Mean Air Temperature (°F)	Rank (#)
Statewide	57.4	99
Climate Division 1	59.3	84
Climate Division 2	58.7	89
Climate Division 3	59.0	95
Climate Division 4	58.7	101
Climate Division 5	58.2	97
Climate Division 6	56.9	104
Climate Division 7	55.0	98
Climate Division 8	50.8	101
Allegany	54.5	97
Anne Arundel	59.1	100
Baltimore	56.9	103
Baltimore City	58.7	104
Calvert	58.9	93
Caroline	58.0	91
Carroll	55.9	108
Cecil	57.5	105
Charles	58.9	97
Dorchester	59.0	87
Fredrick	56.4	110
Garrett	50.8	98
Harford	57.1	98
Howard	56.9	105
Kent	58.3	98
Montgomery	57.4	106
Prince George's	58.4	100
Queen Anne's	58.3	95
Saint Mary's	59.0	82
Somerset	59.4	75
Talbot	58.9	91
Washington	55.4	100
Wicomico	58.8	88
Worcester	59.5	88

Region	Acc. Total Precipitation (in)	Rank (#)
Statewide	2.19	15
Climate Division 1	2.61	40
Climate Division 2	2.21	19
Climate Division 3	2.24	26
Climate Division 4	2.22	23
Climate Division 5	1.94	12
Climate Division 6	2.11	14
Climate Division 7	1.84	13
Climate Division 8	2.28	17
Allegany	1.95	21
Anne Arundel	2.27	24
Baltimore	2.47	27
Baltimore City	2.39	28
Calvert	2.28	27
Caroline	2.17	19
Carroll	2.20	18
Cecil	2.24	20
Charles	2.14	24
Dorchester	2.21	21
Fredrick	1.83	8
Garrett	2.27	17
Harford	2.18	16
Howard	2.13	21
Kent	1.89	12
Montgomery	1.78	7
Prince George's	2.19	24
Queen Anne's	2.00	13
Saint Mary's	2.38	31
Somerset	2.69	45
Talbot	2.29	21
Washington	1.72	10
Wicomico	2.36	30
Worcester	2.73	43

Table A1. Seasonal mean surface air temperature (left) and accumulated total precipitation (right) in Maryland (statewide), climate division, and county levels for fall 2025. Temperatures are in °F, and precipitation is in inches. The rank is the order that the variable for fall 2025 occupies among the 131 falls since 1895 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., 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	67.6	94
Climate Division 1	68.5	64
Climate Division 2	68.5	80
Climate Division 3	68.9	88
Climate Division 4	68.9	102
Climate Division 5	68.1	88
Climate Division 6	67.2	101
Climate Division 7	66.8	100
Climate Division 8	61.8	100
Allegany	66.5	96
Anne Arundel	68.9	102
Baltimore	67.4	102
Baltimore City	68.6	105
Calvert	68.6	85
Caroline	68.3	81
Carroll	66.7	106
Cecil	67.3	103
Charles	69.4	91
Dorchester	68.6	79
Fredrick	66.9	104
Garrett	61.8	101
Harford	67.0	95
Howard	67.6	104
Kent	68.0	91
Montgomery	67.7	102
Prince George's	69.0	101
Queen Anne's	68.1	85
Saint Mary's	68.6	78
Somerset	68.5	62
Talbot	68.3	80
Washington	67.2	105
Wicomico	68.7	70
Worcester	68.3	66

Region	Minimum Air Temperature (°F)	Rank (#)
Statewide	47.1	102
Climate Division 1	50.0	101
Climate Division 2	48.8	101
Climate Division 3	49.0	93
Climate Division 4	48.6	98
Climate Division 5	48.4	106
Climate Division 6	46.5	109
Climate Division 7	43.0	88
Climate Division 8	39.8	93
Allegany	42.5	93
Anne Arundel	49.2	95
Baltimore	46.4	103
Baltimore City	48.9	98
Calvert	49.2	91
Caroline	47.6	102
Carroll	45.1	110
Cecil	47.8	108
Charles	48.5	95
Dorchester	49.3	99
Fredrick	45.8	104
Garrett	39.8	93
Harford	47.1	105
Howard	46.2	103
Kent	48.7	105
Montgomery	47.0	106
Prince George's	47.9	98
Queen Anne's	48.4	105
Saint Mary's	49.4	86
Somerset	50.4	90
Talbot	49.5	98
Washington	43.6	85
Wicomico	48.9	101
Worcester	50.6	107

Table A2. Seasonal maximum (left) and minimum (right) surface air temperatures in Maryland (statewide), climate division, and county levels for fall 2025. Temperatures are in °F. The rank is the order that the variable for fall 2025 occupies among the 131 falls since 1895 after the 131 values have been arranged from the lowest to the 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. Fall 2025 Bar Graphs: Statewide, Climate Divisions, and Counties

A. Temperatures and Precipitation

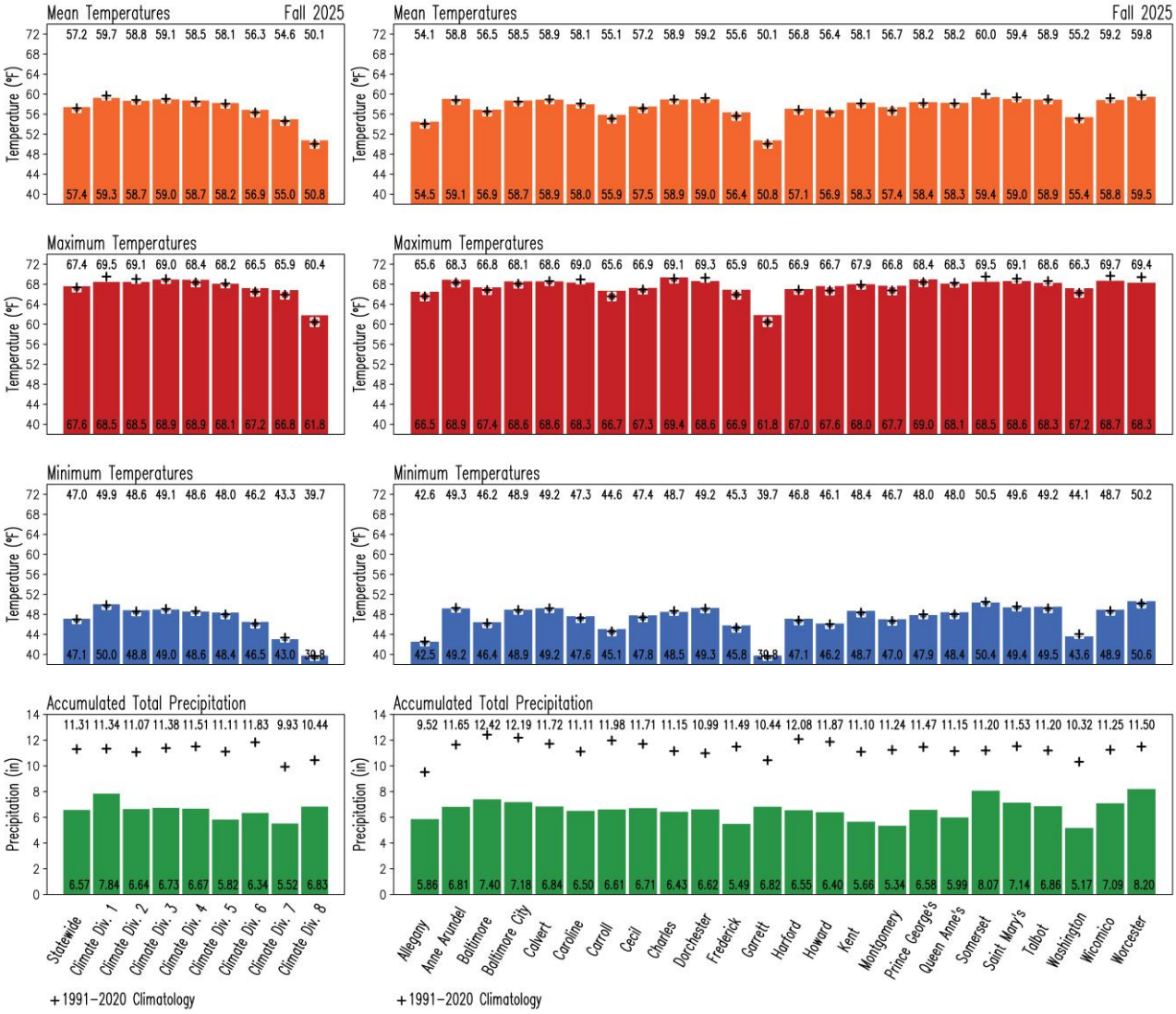

Figure B1. Seasonal surface variables in Maryland for fall 2025. Color bars represent the variables as follows: mean surface air temperature (orange), maximum surface air temperature (red), minimum surface air temperature (blue), and accumulated total precipitation (green) at statewide and climate division (left column), and at 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 fall 2025. For comparison, the corresponding 1991-2020 climatological values for fall are displayed as black addition signs, and their magnitudes are shown at the top of the panels.

B. Temperature and Precipitation Anomalies

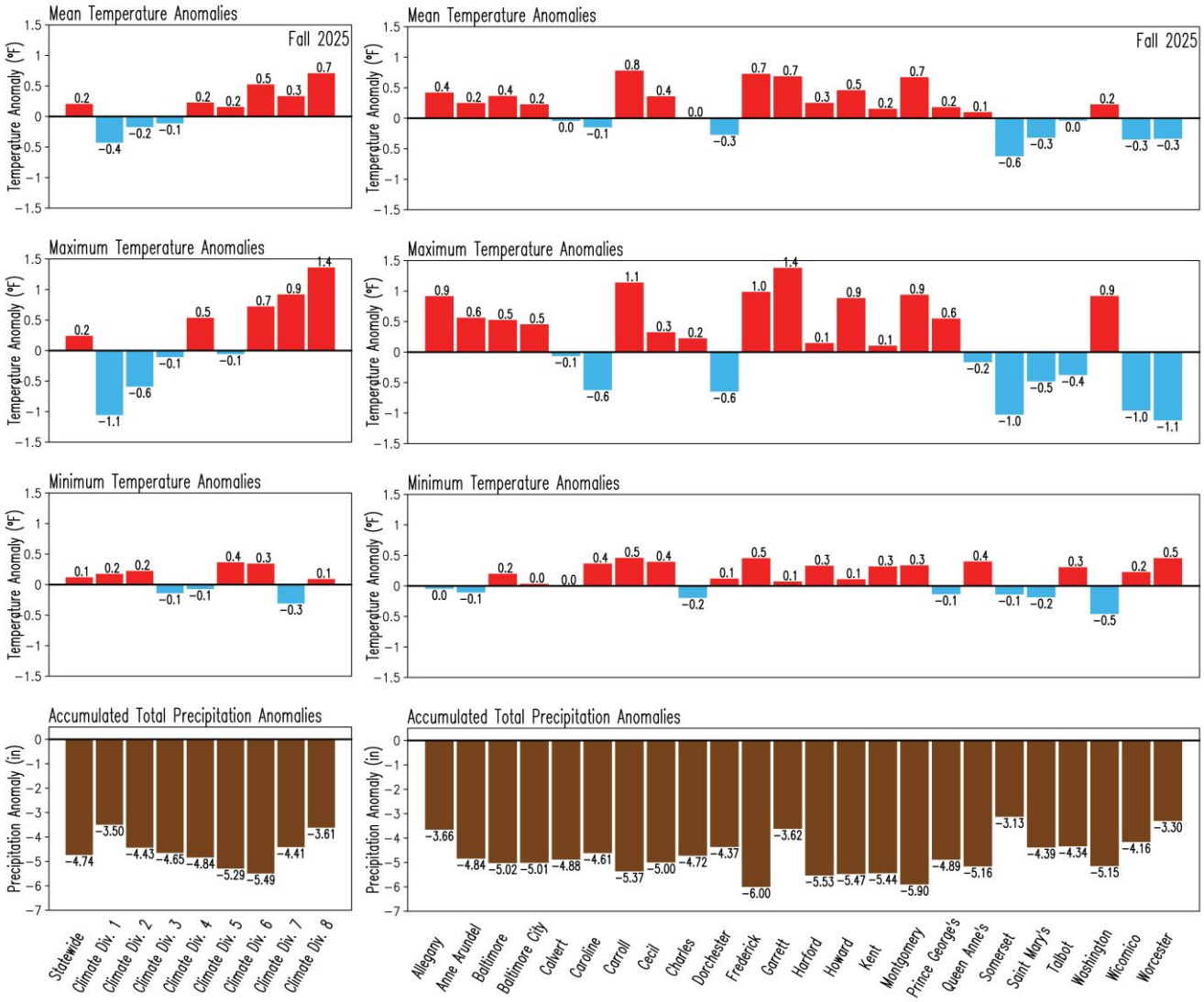

Figure B2. Anomalies of the seasonal surface variables in Maryland for fall 2025. Anomalies are with respect to the 1991-2020 climatology. The red/blue color represents warmer/colder than normal anomalies for mean surface air temperature (upper row), maximum surface air temperature (second row from top), and minimum surface air temperature (third row from top), while the brown color indicates drier than normal anomalies in accumulated total precipitation (bottom row) at statewide and climate division (left column), and at 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 fall 2025.

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

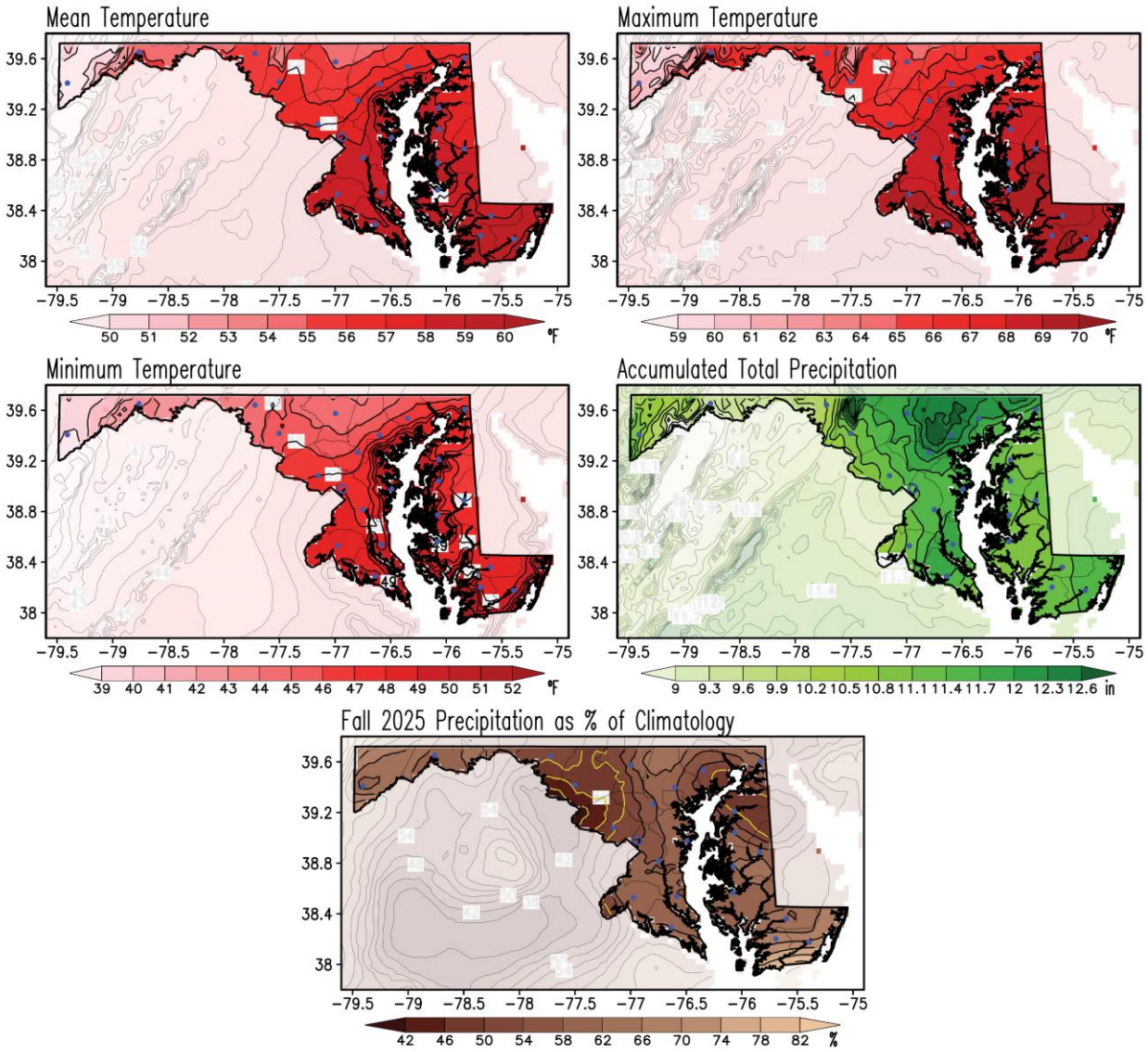

Figure C1. Fall climatology of the seasonal mean, maximum, and minimum surface air temperatures, and accumulated total precipitation for the period 1991-2020 (upper and middle rows), and precipitation in fall 2025 as a percentage of climatology (bottom row). Temperatures are in °F and precipitation in inches, as indicated by the color bars. This is the current climate normal against which the fall 2025 conditions are compared to obtain the fall anomalies (from Figures 1 to 4). The precipitation as a percentage is obtained by dividing the total precipitation (from Figure 4) by the climatology (from the middle-right panel) and multiplying that ratio by 100, so units are in percent of climatology (%); brown shading in this map shows drier-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: The Water Year 1991-2020 Climatology, and October 2024 – September 2025 as Percentage of Climatology

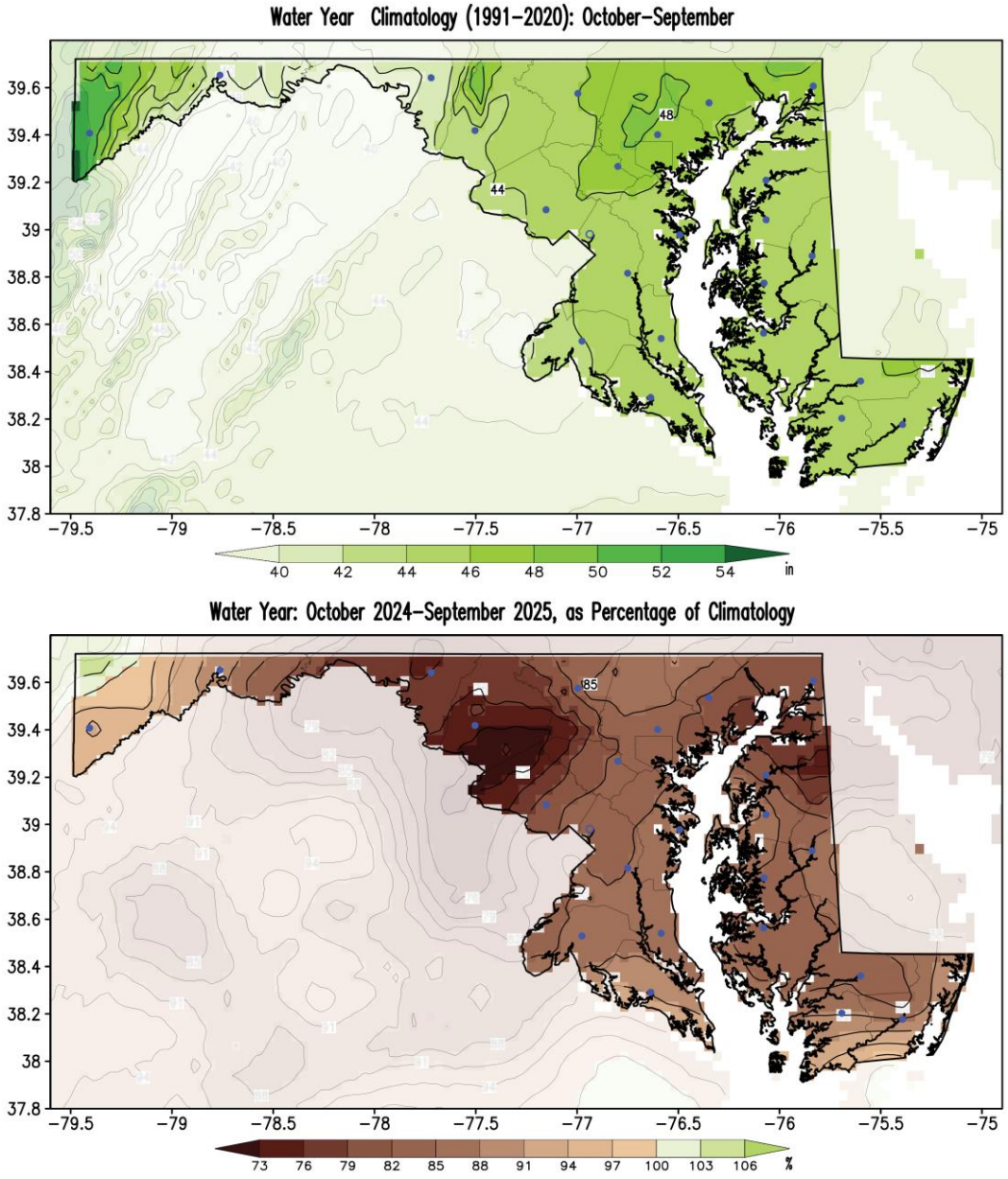

Figure D1. Climatology of the water year (October – September, top panel), and the 2025 water year (October 2024 – September 2025) as a percentage of the climatology (bottom panel). Climatology is for the period 1991-2020. The climatology for the water year is in inches, following the color bar. The 2025 water year as a percentage of climatology is obtained by dividing the 2025 water year (Figure 5, upper panel) by the climatology (upper panel) and multiplying the ratio by 100; hence, units are in percent (%). Brown/green shading in the percentage map highlights regions where the 2025 water year is drier/wetter than normal. Note that shading outside the state has been washed out to facilitate focus on Maryland. Filled blue circles mark the county seats.

Appendix E. Fall Standard Deviation and Fall 2025 Standardized Anomalies Maps

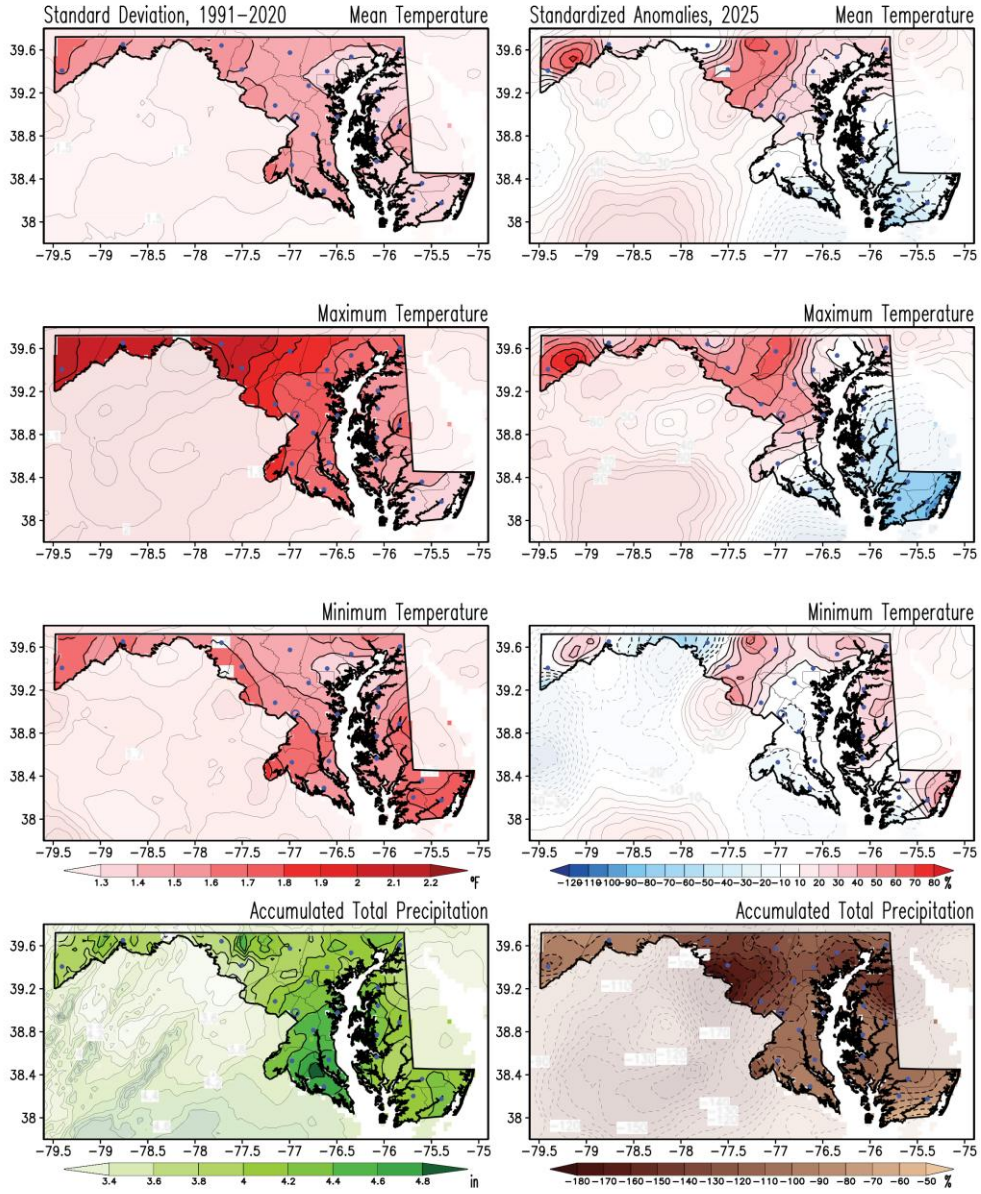

Figure E1. Standard deviation for fall and standardized anomalies of temperatures and precipitation for fall 2025. Standard deviations for seasonal mean, maximum, and minimum surface air temperatures and accumulated total precipitation were obtained for the 1991-2020 period (left column). Anomalies for fall 2025 (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 shading in the anomaly precipitation map marks drier-than-normal conditions. The standardized anomalies are obtained by dividing the raw anomalies (from Figures 1 to 4) by the standard deviation (from the left column panels) and multiplying the result by 100; hence, the units are in percent (%). Note that shading outside the state has been washed out to facilitate focus on Maryland. Filled blue circles mark the county seats.

Appendix F. 2007-2020 Mean and Standard Deviation of Sea Surface Temperatures in Fall

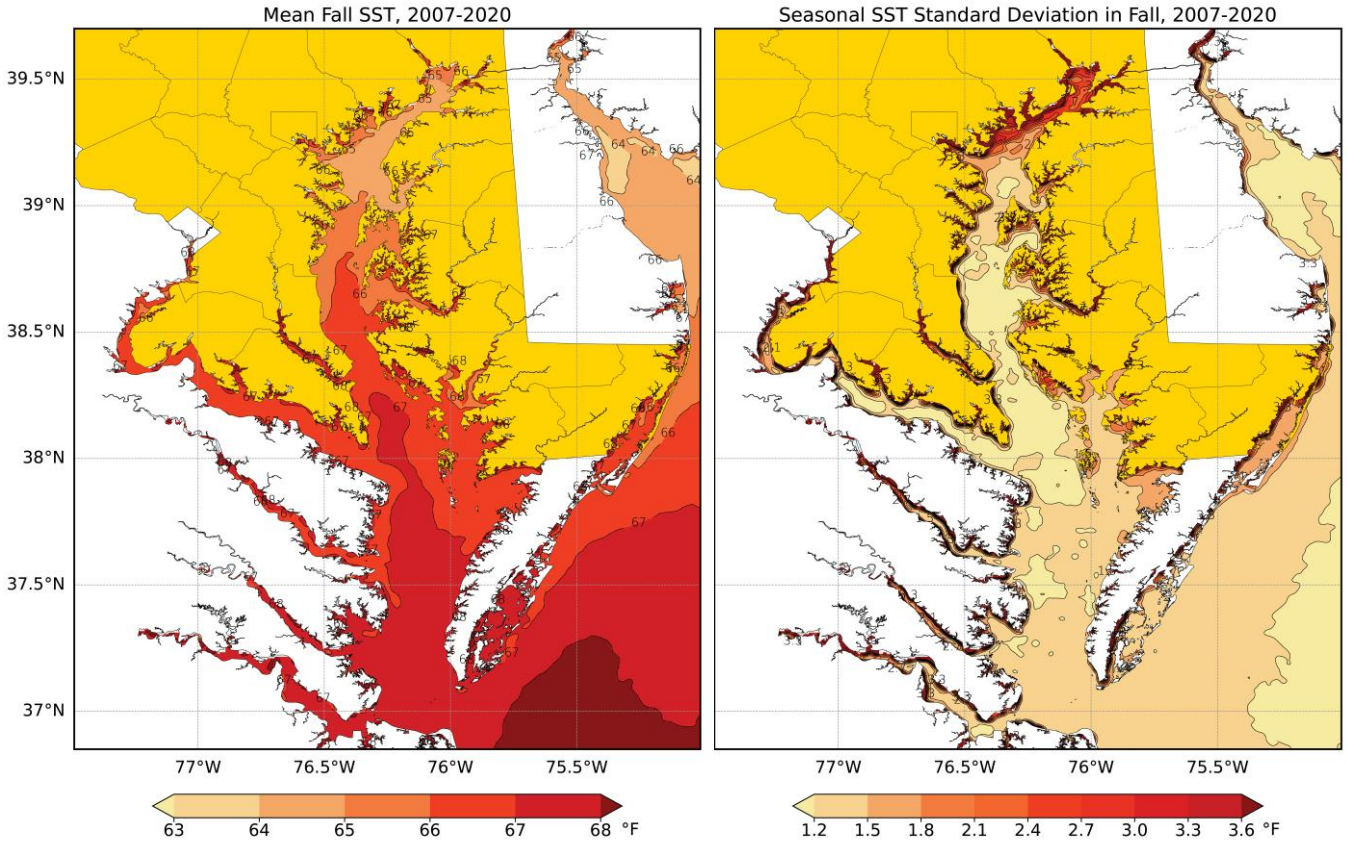

Figure F1. Mean (left panel) and standard deviation (right panel) of seasonal sea surface temperatures in the Chesapeake Bay and surrounding coastal areas in fall for the period 2007-2020. The mean and standard deviation of the temperatures are in °F as indicated by the color bars. The mean temperature map is the current mean against which the fall 2025 conditions are compared to obtain the fall 2025 anomalies (from Figure 11). For clarity, the mean and standard deviation of the temperature 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.

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