MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

Climate Change Implementation Plan

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Gov. Whitmer Urges Small Businesses Impacted by Lack of Snow to Apply for Available Federal Funding

March 04, 2024

Record-Breaking Winter

- The UP200 was cancelled for the second year in a row because of warm weather.
- 16% of the Great Lakes froze over this winter, compared to 53% normally.
- Marquette has seen 72.6 inches of snow this season, compared to 127 inches on average.
- The Copper Dog 150 in the Keweenaw Peninsula was cancelled due to weather.
- The Tahquamenon Country Sled Dog Race in Newberry was cancelled due to weather.
- Detroit reached 73 degrees on February 27, the hottest February day in recorded history—dating back to 1874.
- Snowfall in Grand Rapids is more than three feet—36 inches—below the seasonal average.

WEATHER

Beryl brought record-breaking rainfall to some Michigan cities

Updated: Jul. 11, 2024, 2:10 p.m. | Published: Jul. 11, 2024, 10:04 a.m.

Widespread rainfall totals of 2 to 6 inches were reported across lower Michigan with localized totals in excess of 7 inches.

Flint received 3.27 inches of rain on Wednesday, breaking the previous daily record of 1.63 inches of rain that was set in 1970.

Areas of the City of East Lansing received over 5 inches of rain within a period of less than two hours on Tuesday, July 9, resulting in flooded streets and properties across the City.

MICHIGAN

Dry September leaves parts of Michigan in moderate drought or abnormally dry: See the map

Kylie Martin
Detroit Free Press

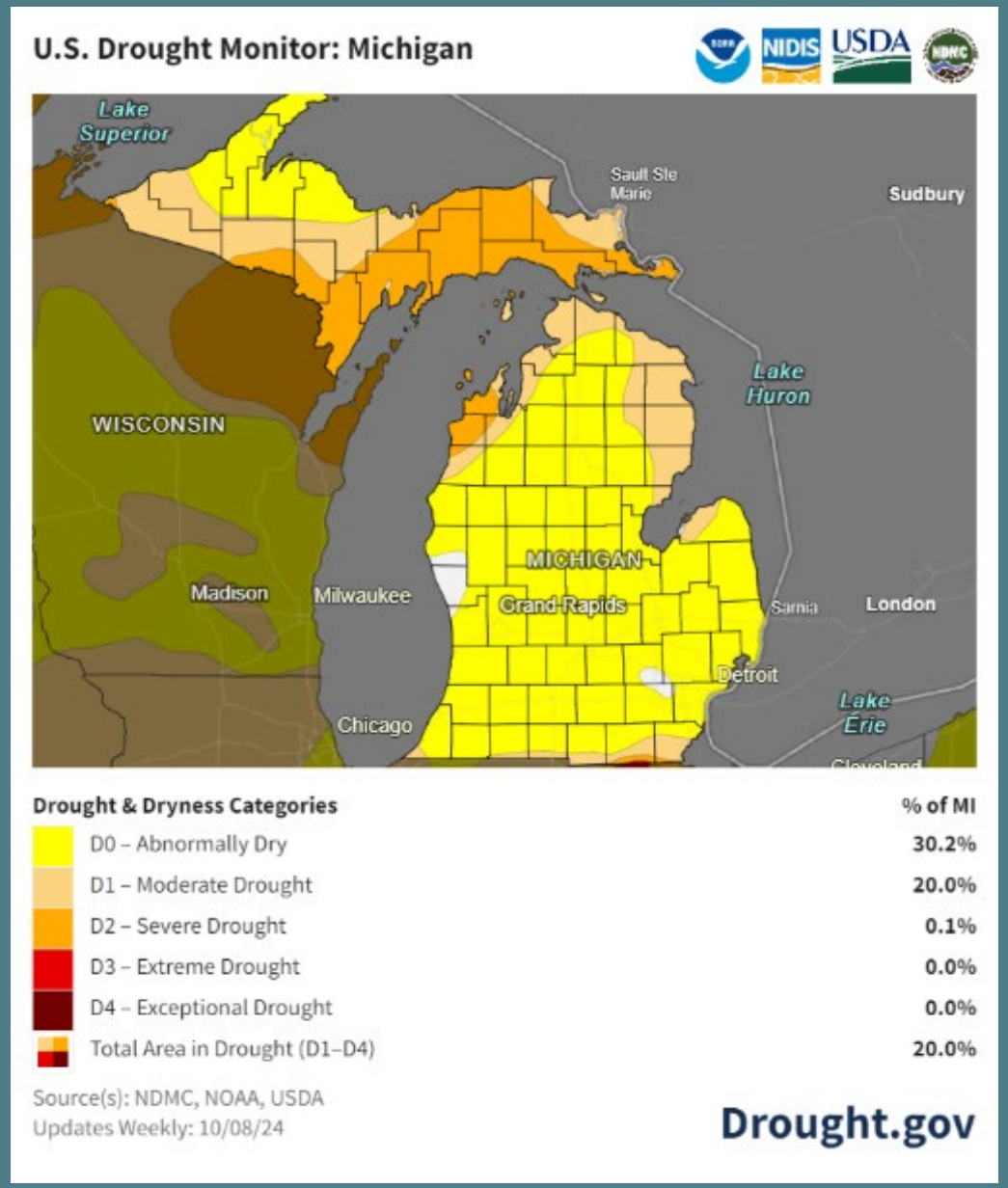
Published 12:00 p.m. ET Sept. 19, 2024 | **Updated 2:20 p.m. ET Sept. 19, 2024**

Drought expansion explodes over Michigan in the last week

Updated: Oct. 08, 2024, 7:23 a.m. | Published: Oct. 08, 2024, 7:16 a.m.

Be careful out there! Fire danger is expected to remain high through the weekend

October 10, 2024



EGLE

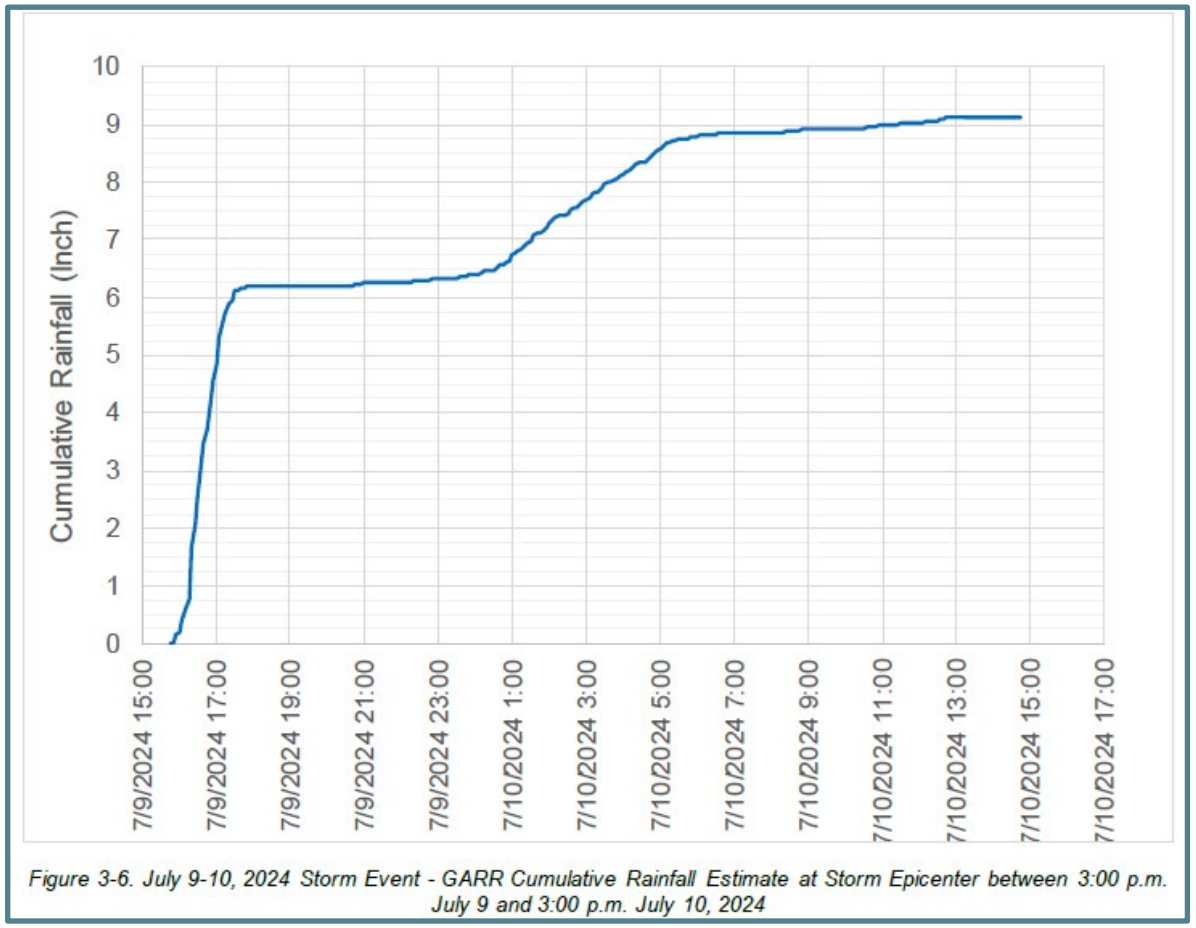


Figure 3-6. July 9-10, 2024 Storm Event - GARR Cumulative Rainfall Estimate at Storm Epicenter between 3:00 p.m. July 9 and 3:00 p.m. July 10, 2024

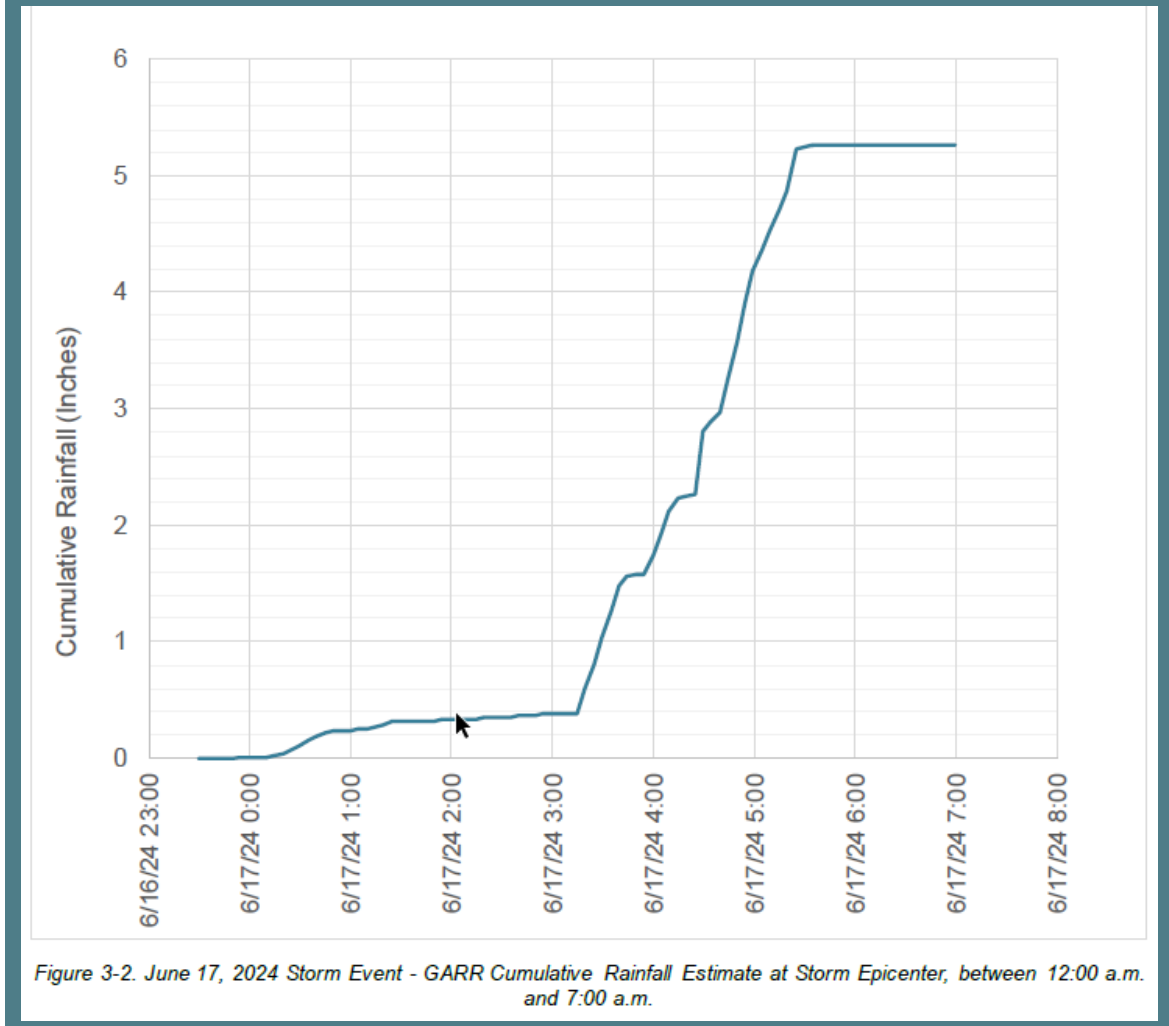
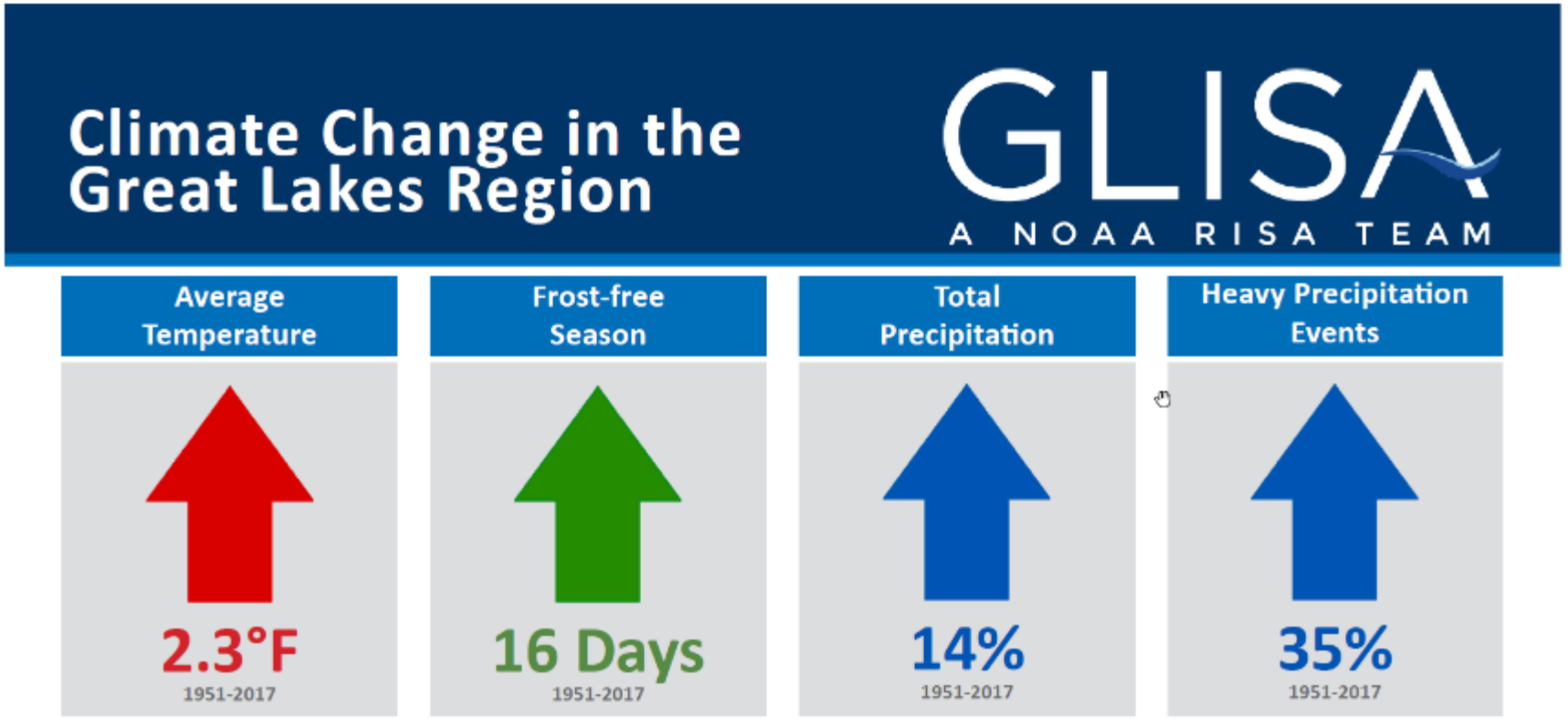


Figure 3-2. June 17, 2024 Storm Event - GARR Cumulative Rainfall Estimate at Storm Epicenter, between 12:00 a.m. and 7:00 a.m.

Increased Precipitation and Intensity



Great Lakes Integrated Sciences and Assessments

DoD/EPA/DOE: Strategic Environment Research Development Program (SERDP)

Atlas 14, Volume 8 (2013)

Lansing, Michigan

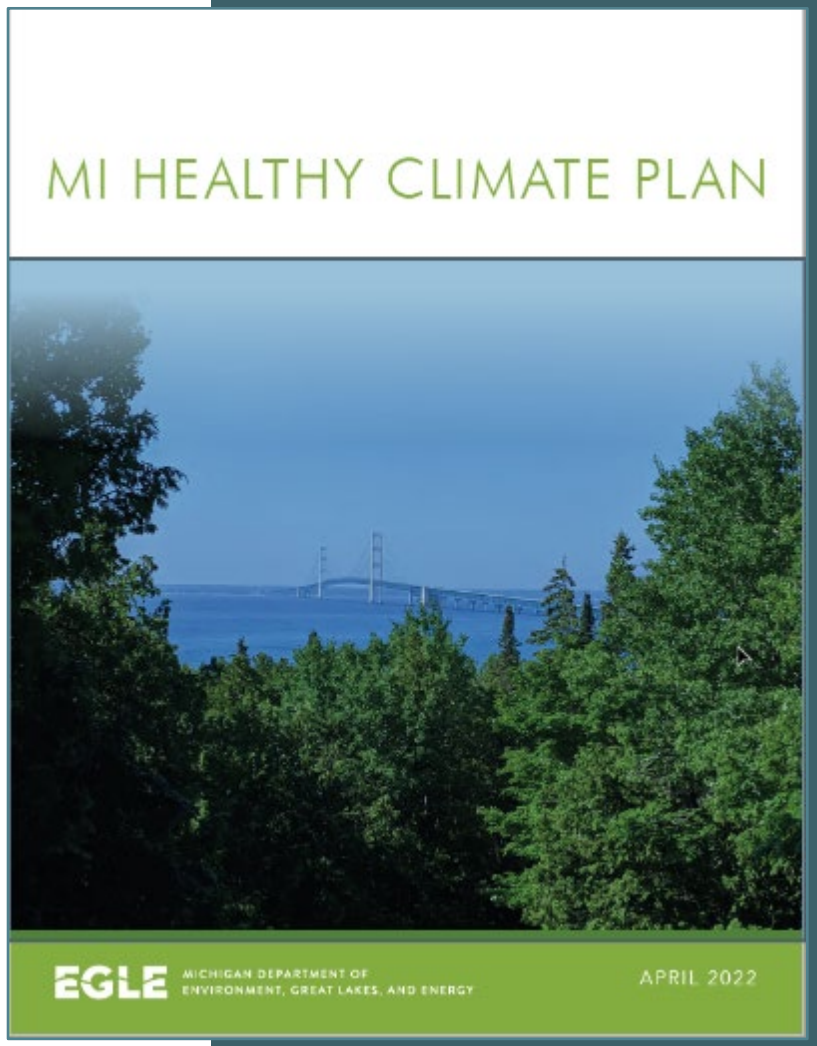
- 2yr/24hr – 2.41
- 25yr/24hr – 4.12

Decade	RCP4.5 2yr/24hr	RCP8.5 2yr/24hr	RCP4.5 25yr/24hr	RCP8.5 25yr/24hr
2025	2.53	2.55	4.38	4.42
2035	2.57	2.61	4.44	4.52
2045	2.6	2.68	4.5	4.64
2055	2.64	2.72	4.56	4.73
2065	2.65	2.8	4.6	4.87
2075	2.67	2.88	4.63	5.03
2085	2.67	2.97	4.65	5.21

Guiding Information

- Areas of Michigan have already experienced the costly impacts from climate change in the form of flooding, damaged infrastructure, property loss, and degraded water quality.
- GLISA climate models project the Great Lakes region will experience a greater increase in total precipitation in the future than most other regions of North America.
- The increased frequency and intensity of extreme events is expected to continue.

Plan Objectives



Frequent and intense storms

Michigan is experiencing historic levels of rain and intense storms. A continuation of extreme rain will lead to more property loss and infrastructure failures…

WRD Policy: Considering Climate Change in Water Resources Division Programs (2016)

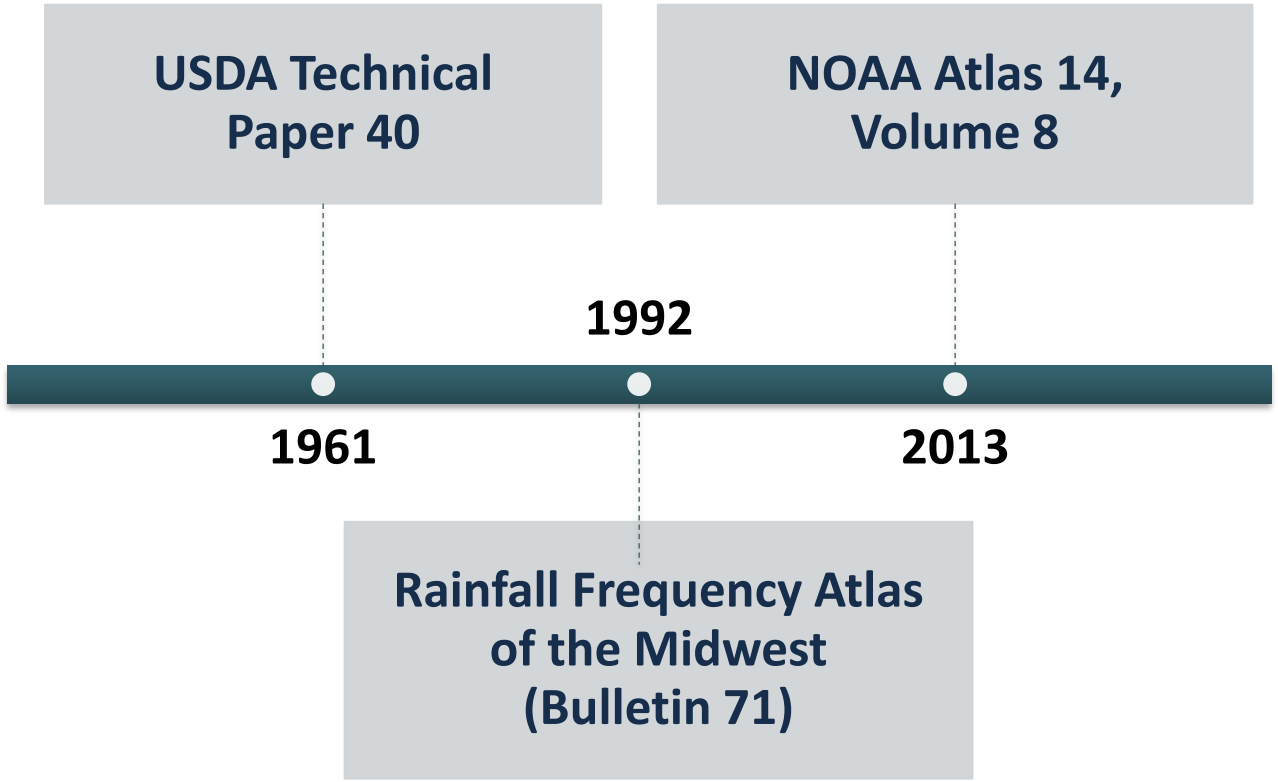
Groundwater, Surface Water, and Water Resources Programs

Because the effects of climate change could lead to significant impairment and destruction of the state's water resources, the WRD needs to incorporate climate change adaptation and mitigation considerations into these programs.

Each program within the WRD should develop steps to incorporate climate change adaptation and mitigation considerations that are practical and reasonable to perform by program staff in order to accomplish the goal of minimizing the detrimental effects of climate change on Michigan's water resources.

Program	Storm Event
MS4	The post-construction runoff rate and volume of discharge shall not exceed the predevelopment rate and volume for all storms up to the 2-year, 24-hour storm event at the project site.
CSO	Retention, for transportation and treatment at the wastewater treatment plant, of flows generated during storms up to the 1-year, 1-hour storm event. Primary treatment of flows generated during storms up to the 10-year, 1-hour storm event. Demonstration approach allowed with verification that WQS are met at time of discharge.
SSO	Remedial design standard for the 25-year, 24-hour storm event defined as a 3.9-inch, 24-hour storm event with use of the SCS Type II rainfall distribution.

Precipitation Data Sources



Climate Change Implementation Plan

- Consistent use of NOAA Atlas 14 across all wet weather programs for the design storms.
- NOAA Atlas 14 represents a greater period of recorded precipitation and denser data networks.
- Support NOAA updating atlases every 10 years (Atlas 15 expected in 2027).

Review of Updated Approaches

- Illinois State Water Survey released the Precipitation Frequency Study for Illinois, Bulletin 75 in 2020.
- Precipitation frequencies updated for 10 regions
- The study does not cover Michigan, but the approach and results are an indicator for future rainfall statistics.
- Study identified an 11% increase in average annual precipitation over the past century.
- Adjustment applied to account for nonstationary climate.
- **Estimates were higher than previous bulletins and NOAA Atlas 14.**

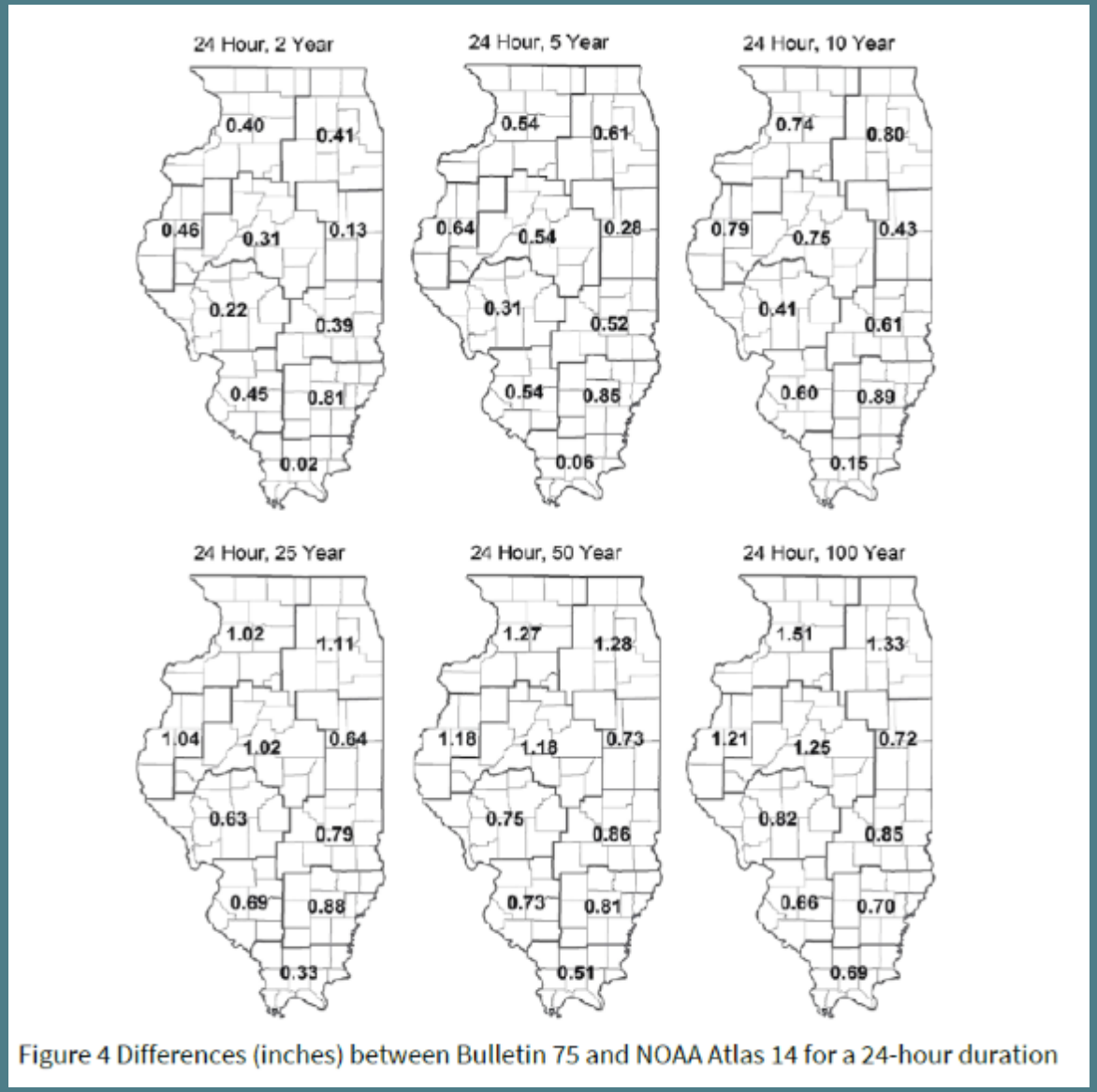


Figure 4 Differences (inches) between Bulletin 75 and NOAA Atlas 14 for a 24-hour duration

Review of Updated Approaches

- Incorporate the use of historical storm events in the design process: Lexington-Fayette Urban County Government.
- Change in level of service: City of Madison increased the detention basin design standard from a 100-year event to a 200-year event.
- Consider cloudbursts: NYC completed a Cloudburst Resiliency Planning Study that recommended green infrastructure to buffer extreme rain events.

Review of Updated Approaches

Focus on NOAA Atlas 14

- Use of the Atlas 14 upper confidence interval.
- Flat Rate Increase: City of Virginia Beach updated standards to increase design rainfall by 20% over Atlas 14 values.

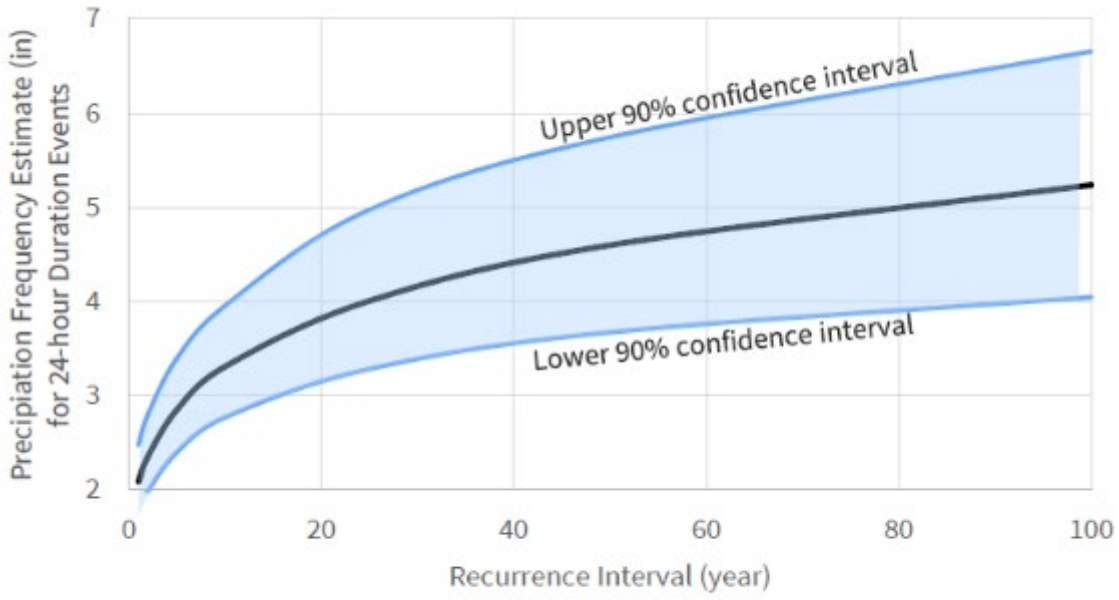


Figure 8 Precipitation Frequency Estimates 90% Confidence Intervals

Proposed Resiliency Factor by Program

CSO: 10% increase in storage volume for Retention Treatment Basins (RTB)

SSO: 10% increase in storage volume for design values using the Remedial Design Standard (25-year, 24-hour)

MS4: 10% increase in stormwater runoff volume above the Channel Protection Performance Standard (2 year, 24-hour storm)

Goal: *Incremental progress to address the impacts and potential risks associated with climate change consistent with WRD policy*

Other Plan Recommendations

Concentrated Animal Feeding Operations Program

- Use of NOAA Atlas 14 to design storage structures
- Waste Management: Identify opportunities to withstand increased precipitation and optimize handling during dry conditions

Resources Programs (Michigan Administers Section 404)

- Use of NOAA Atlas 14 for design of stormwater BMPs
- Consider the MS4 Resiliency Factor as part of design

Why 10%

- The flat rate increase approach best satisfied WRD's goal of incremental progress toward addressing climate change and increasing infrastructure resiliency.
- Maintains simplicity of current models and methods by adding 10% to the calculated runoff volume.
- Consultants shared that upsizing or oversizing storm sewers did not have a significant impact on costs, especially considering much of the development subject to the requirement is privately owned and may already be required to oversize as part of regular planning.
- MS4 permittees are still able to assess each site in accordance with approved ordinances to determine when managing the stormwater runoff volume is technically infeasible.
- Commitment to stakeholder group to better understand implementation challenges.

Public Comments

Comments were not extensive. Detroit area CSO/SSO/MS4 permittees and MDOT represented most of the comments. EPA also provided comment.

Themes:

- Cost to implement
- Regulatory authority
- Request for stakeholder involvement
- Request to delay until Atlas 15 is published
- Request to ‘grandfather’ all existing CSO and SSO projects and recognize current systems as meeting past permit requirements
- Concern that the resiliency factors for CSO and SSO requirements will not result in meaningful improvement in untreated discharges
- Request to focus on future rainfall data and/or a selected storm event

Implementation Schedule

The plan will be implemented once final. Each program is expected to implement in accordance with normal permitting activity. The resiliency factor will be applied as followed:

- When escalated enforcement is necessary to address future SSOs.
- When future CSO outfalls require correction as part of an approved Long-Term Control Plan.
- At the time of MS4 individual permit reissuance with a compliance schedule for updating ordinances.

NOAA Atlas 15

2022/2023

- **Feb. - Aug 2022** - Published methodology and briefed stakeholders.
- **Sept. 2022** - Distributed Public Notification Statement (PNS) and collect public feedback.
- **Jan. 2023** - Hosted technical workshop with federal partners.
- **Apr. 2023** - Award contracts and grants and initiate product development.

2024

- **Development** - Evolve framework. Create Quality Controlled National Precipitation Database. Evaluate Climate Model Projections.
- **Pilot** - Deliver Atlas 15 Vol. 1 and Vol. 2 pilot over Montana.

  Collect and adjudicate feedback on preliminary estimates and Web dissemination strategies.

2025

- **CONUS** - Distribute preliminary CONUS estimates for Atlas 15 Vol. 1 and Vol. 2 (lower 48 states).

  Initiate 60-day peer review for Atlas 15 Vol. 1 and Vol. 2.

  Collect feedback and adjudicate comments on product.

2026

- **CONUS** - Complete Atlas 15 Vol. 1 and Vol. 2 and deliver estimates, documentation and supplementary products to stakeholders.
- **oCONUS** - Initiate peer review for oCONUS (e.g. Hawaii, Alaska, Puerto Rico, U.S. Virgin Islands, Guam).

  Collect feedback and adjudicate comments on product.

2027

- **oCONUS** - Complete Atlas 15 Vol. 1 and Vol. 2 and deliver estimates, documentation and supplementary products to stakeholders.