

2024-2025 Winter Outlook for Southeast Michigan

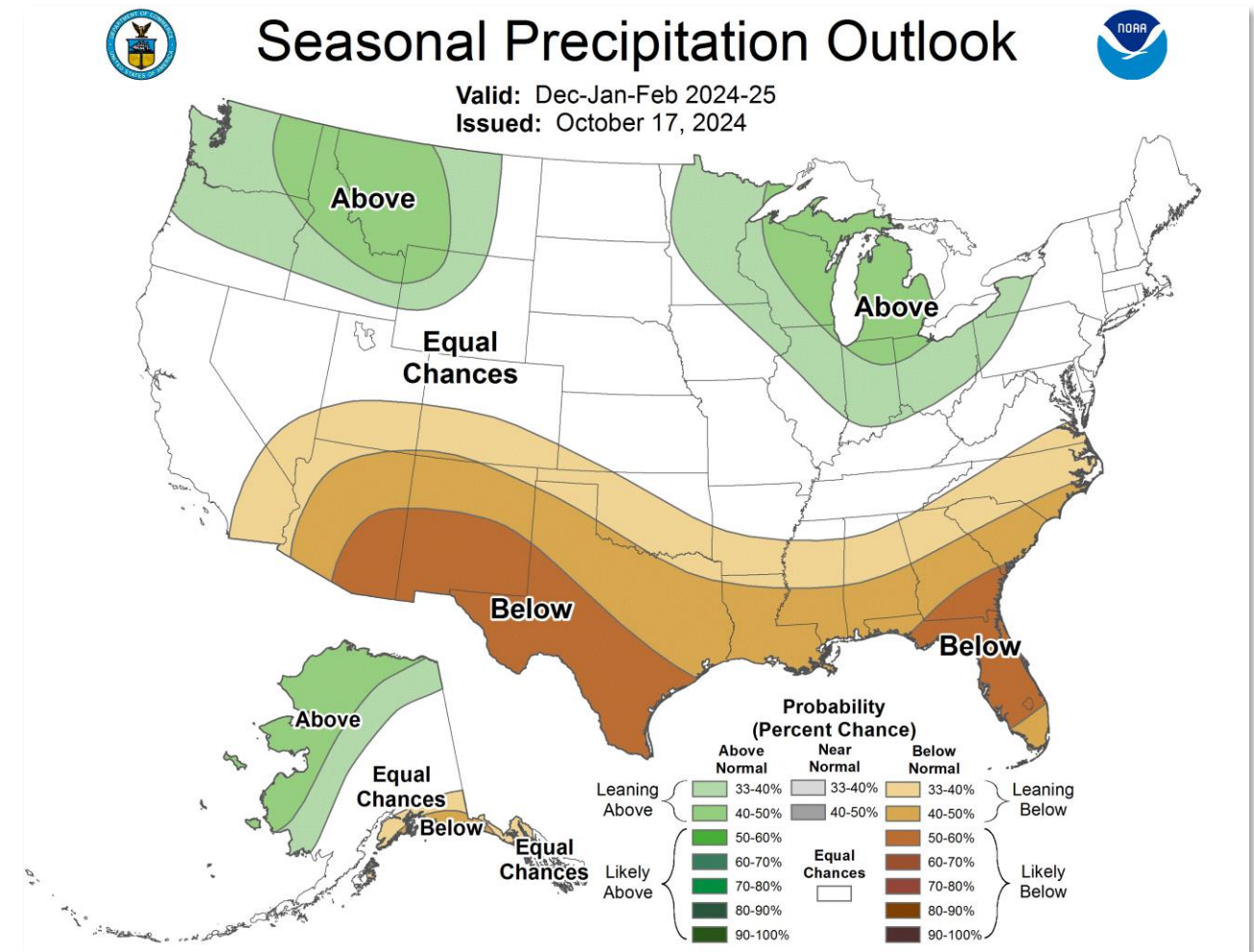
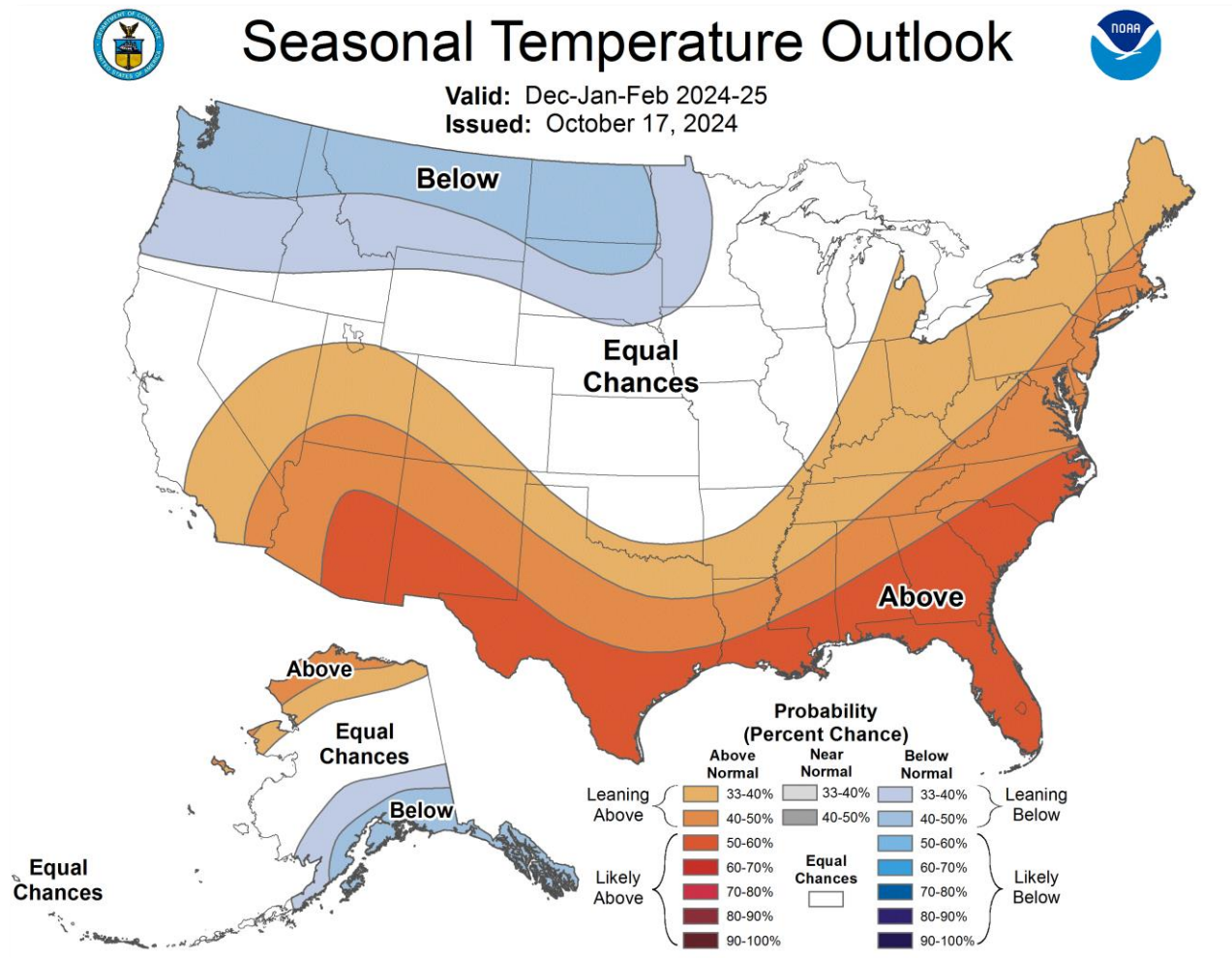
90 Day Outlook Valid December 1, 2024 to February 28, 2025





Official CPC Winter Outlook

2024-2025 Winter Outlook for SE MI



In the official winter outlook from the Climate Prediction Center, probabilities lean toward **above normal temperatures** and **above normal precipitation** for Southeast Michigan. This outlook factors in ENSO, trends in recent winters, dynamical model guidance such as the NMME, and statistical tools. The NOAA press release can be found [here](#).

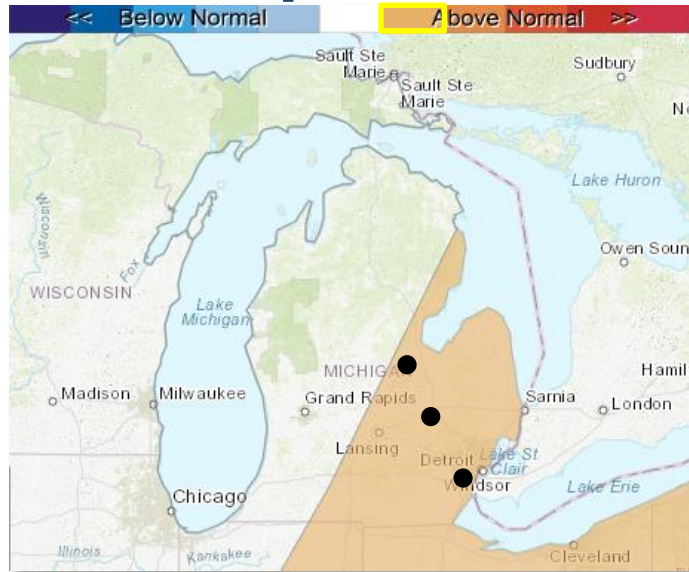




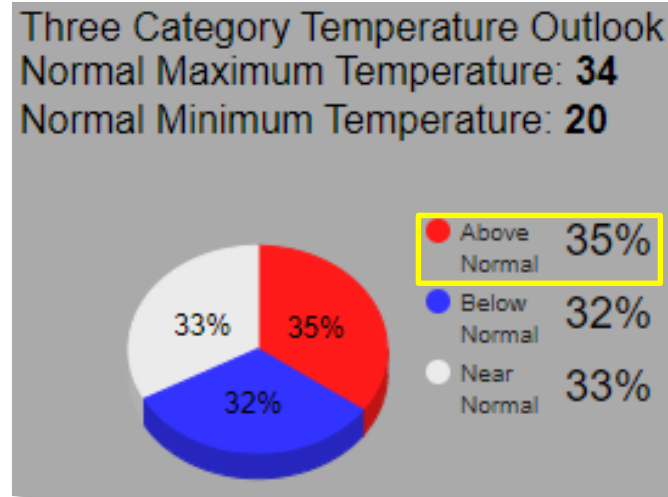
Official CPC Winter Outlook Probabilities

2024-2025 Winter Outlook for SE MI

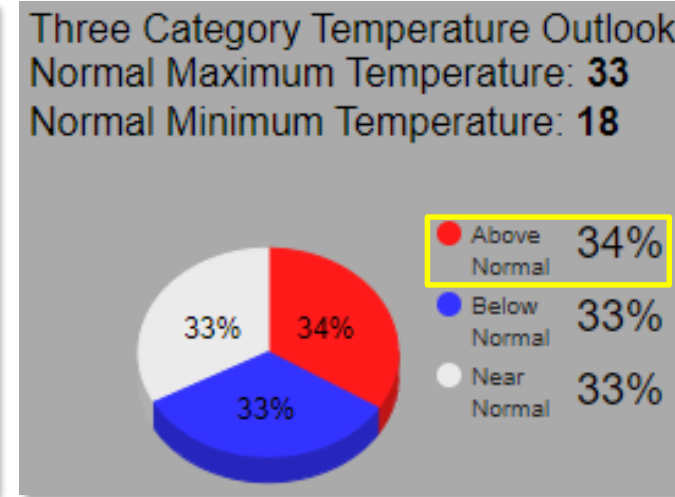
Temperature



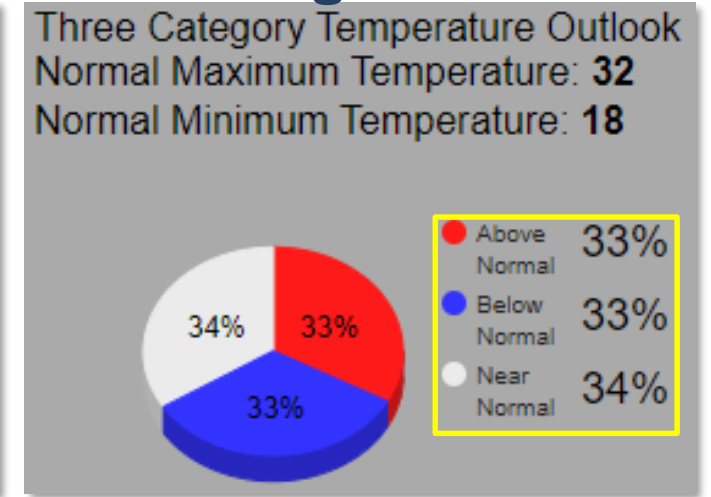
Detroit



Flint



Saginaw

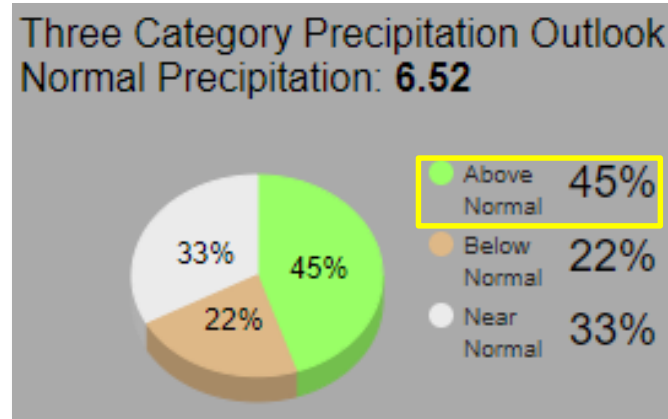


Leaning Toward Above Normal Temperatures

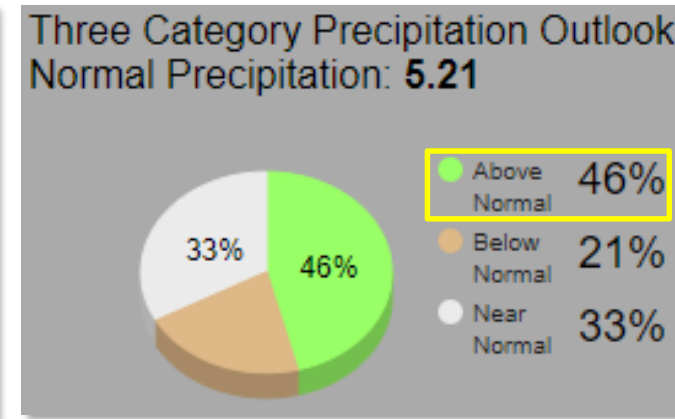
Precipitation



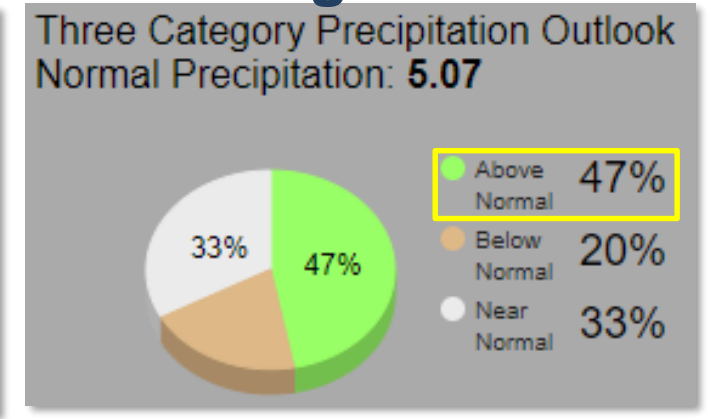
Detroit



Flint



Saginaw



Leaning Toward Above Normal Precipitation

https://www.cpc.ncep.noaa.gov/products/predictions/long_range/interactive/index.php



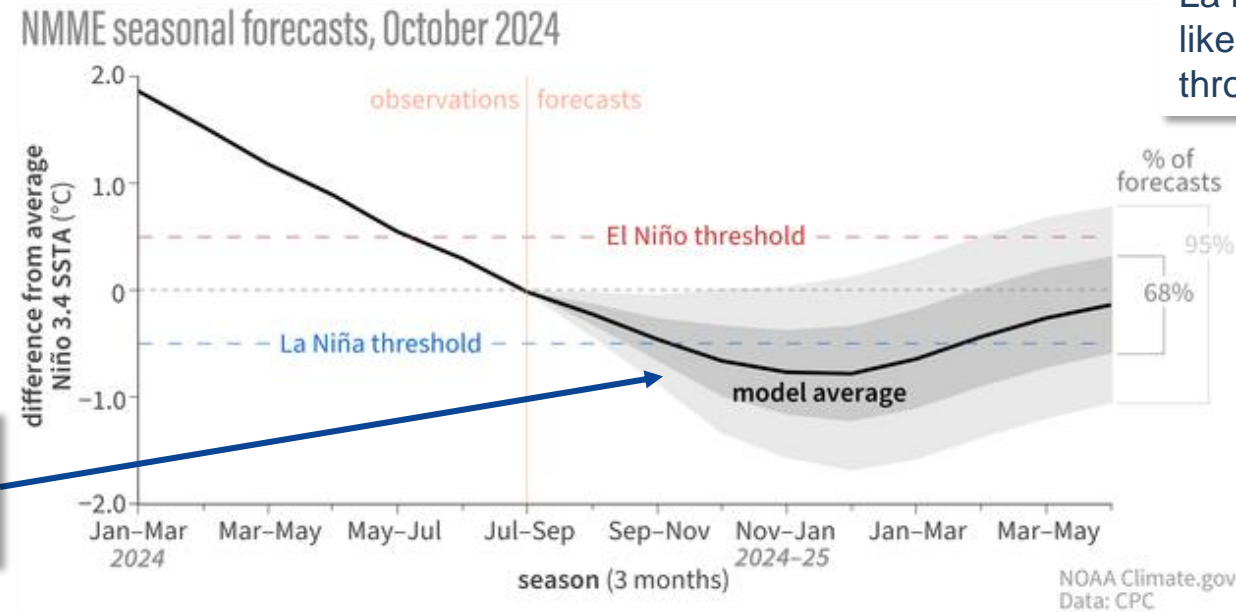
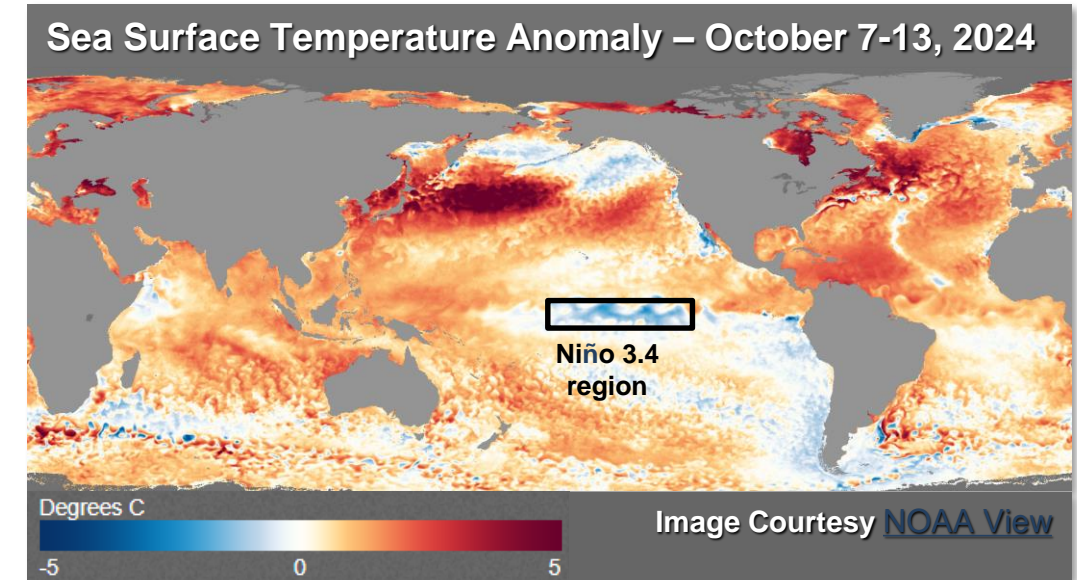


State of ENSO

After a strong El Niño last winter, its counterpart **La Niña** is forecast to return this winter. Cool sea surface temperature anomalies are noted in the central and eastern equatorial Pacific (see black box in image to right), but have yet to fall below the threshold (-0.5°C) needed to declare La Niña (see below). La Niña has a 60% probability to develop during the September-November season and is expected to persist through the January-March 2025 season once it does emerge.

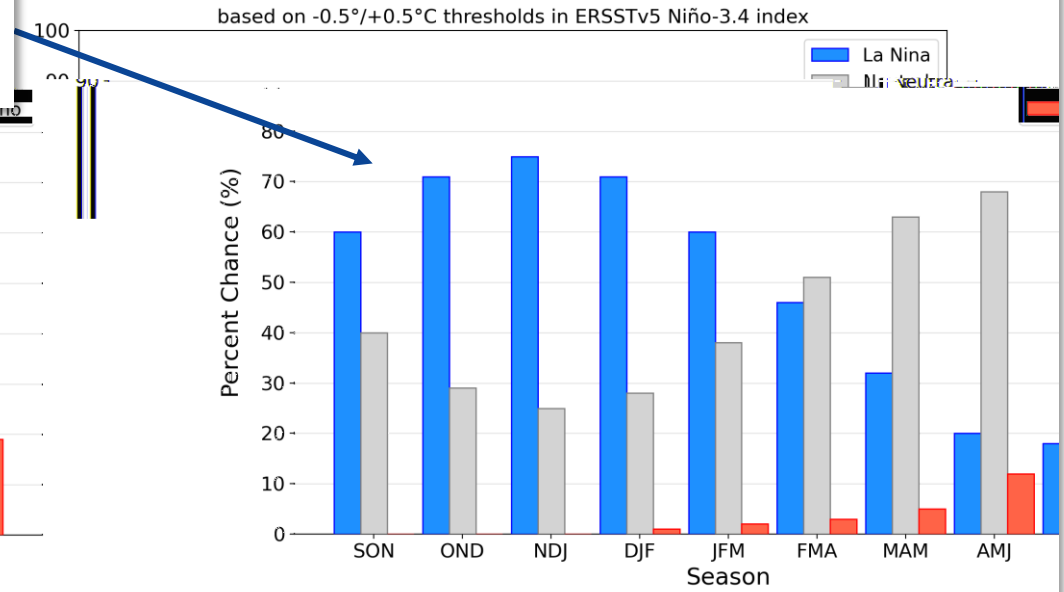
Only four La Niña episodes since 1950 have formed this late in the year, and all of those were either weak or on the border of weak and moderate. This La Niña is also forecast to be a weak event – this means that the typical impacts of La Niña may be dominated by other weather and climate phenomena that aren't predictable at this time range. Still, the presence of La Niña does offer some forecast skill at the seasonal scale. Read more about the La Niña Watch and the latest forecast from CPC [here](#) (updated weekly).

2024-2025 Winter Outlook for SE MI

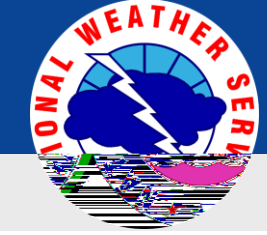


La Niña is most likely to persist through winter.

Official NOAA CPC ENSO Probabilities (issued October 2024)



Anomaly values between -0.5 and -0.9°C are considered a weak event.



Typical La Niña Impacts

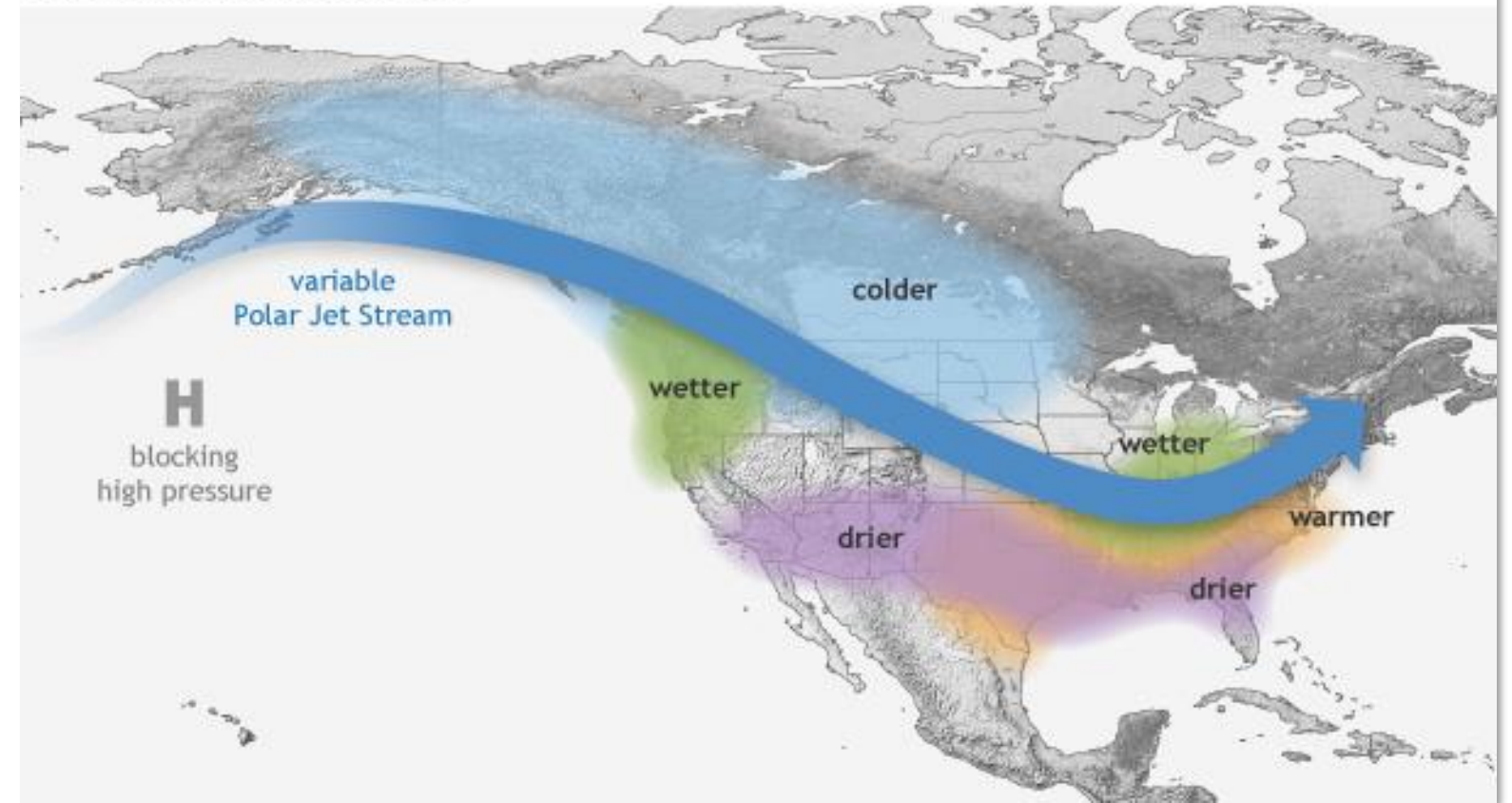
2024-2025 Winter Outlook for SE MI

La Niña will likely influence the atmospheric circulation pattern this winter, with implications on the local conditions for the Great Lakes.

What this can mean:

- An active jet stream pattern across the northern/eastern tier of the US that directs storm systems across the local area. More often than not, La Niña winters are wetter than normal for Southeast MI.
- High sub-seasonal variability in temperatures (alternating cold outbreaks and mild streaks) dependent on the placement of the jet stream.

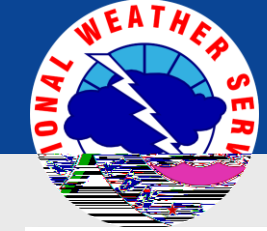
WINTER LA NIÑA PATTERN



What we don't know:

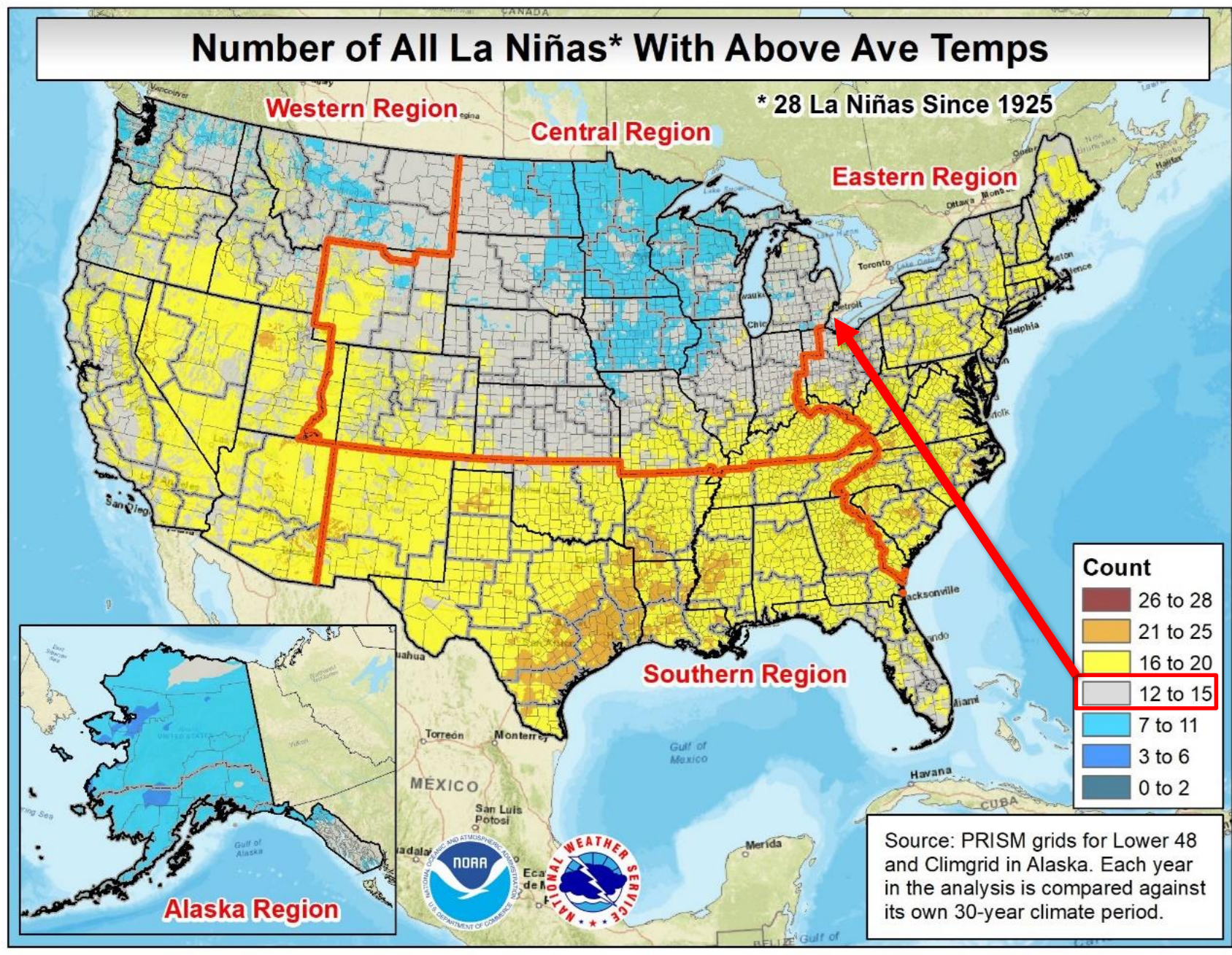
- How other climate signals such as the Arctic Oscillation, North Atlantic Oscillation, and stratospheric warming events may influence local temperature and precipitation patterns on shorter (weekly-to-monthly) time scales. These influences are not predictable at the seasonal time scale.





Historical La Niña Impacts – Temperature

2024-2025 Winter Outlook for SE MI



The graphic shows that in roughly half of La Niña winters since 1925, our area has observed above normal temperatures. This tells us La Niña doesn't have a strong relationship with wintertime temperatures. Higher sub-seasonal temperature variability is common in La Niña, but there has been no consistent lean toward above or below normal temps overall.

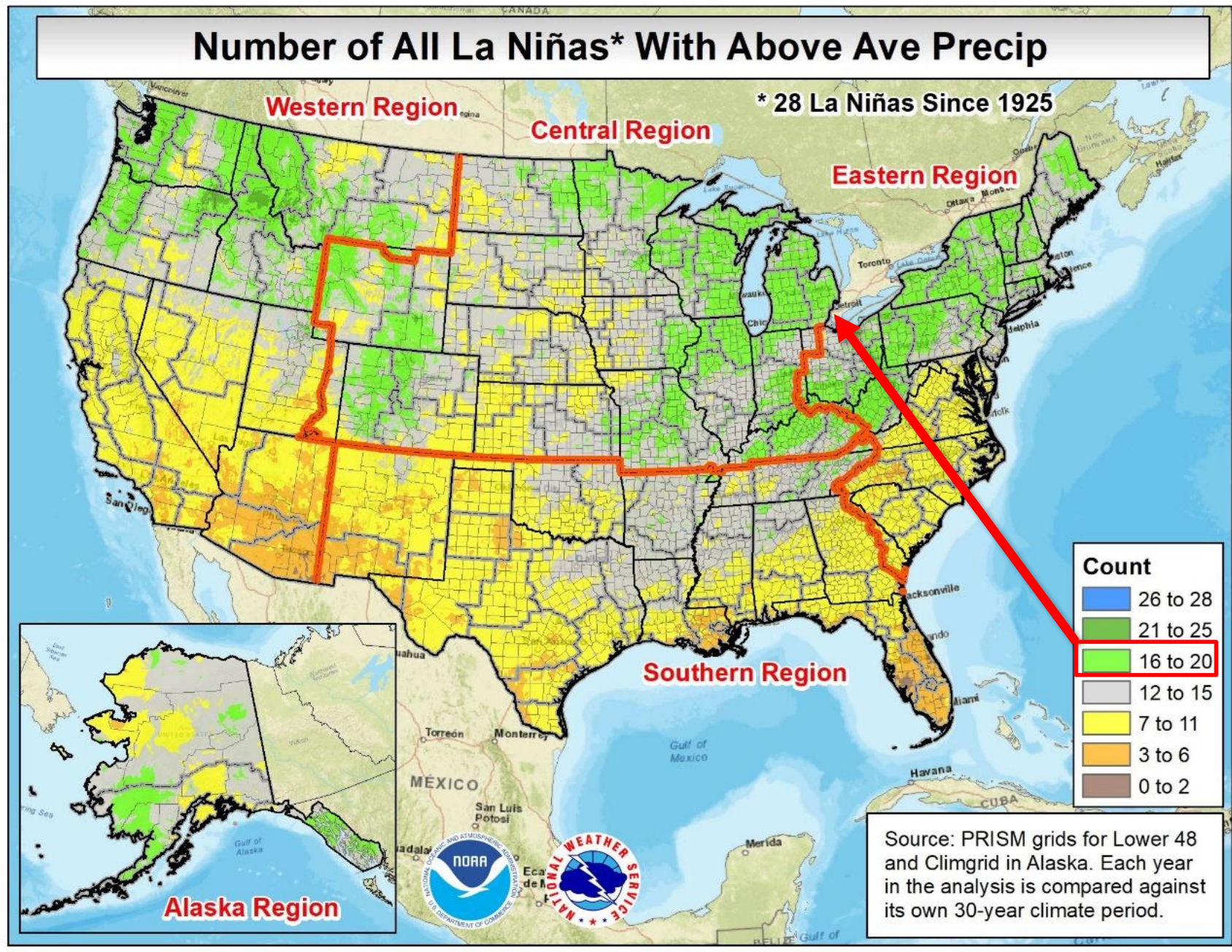
This graphic accounts for trends in average winter temperatures over the years.





Historical La Niña Impacts – Precipitation

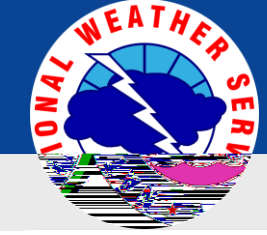
2024-2025 Winter Outlook for SE MI



The graphic shows that our area has observed above normal precipitation in more than half of the La Niña winters since 1925. This tells us that more often than not, La Niña winters have been wetter than normal for the region.

This graphic accounts for trends in average winter precipitation over the years.

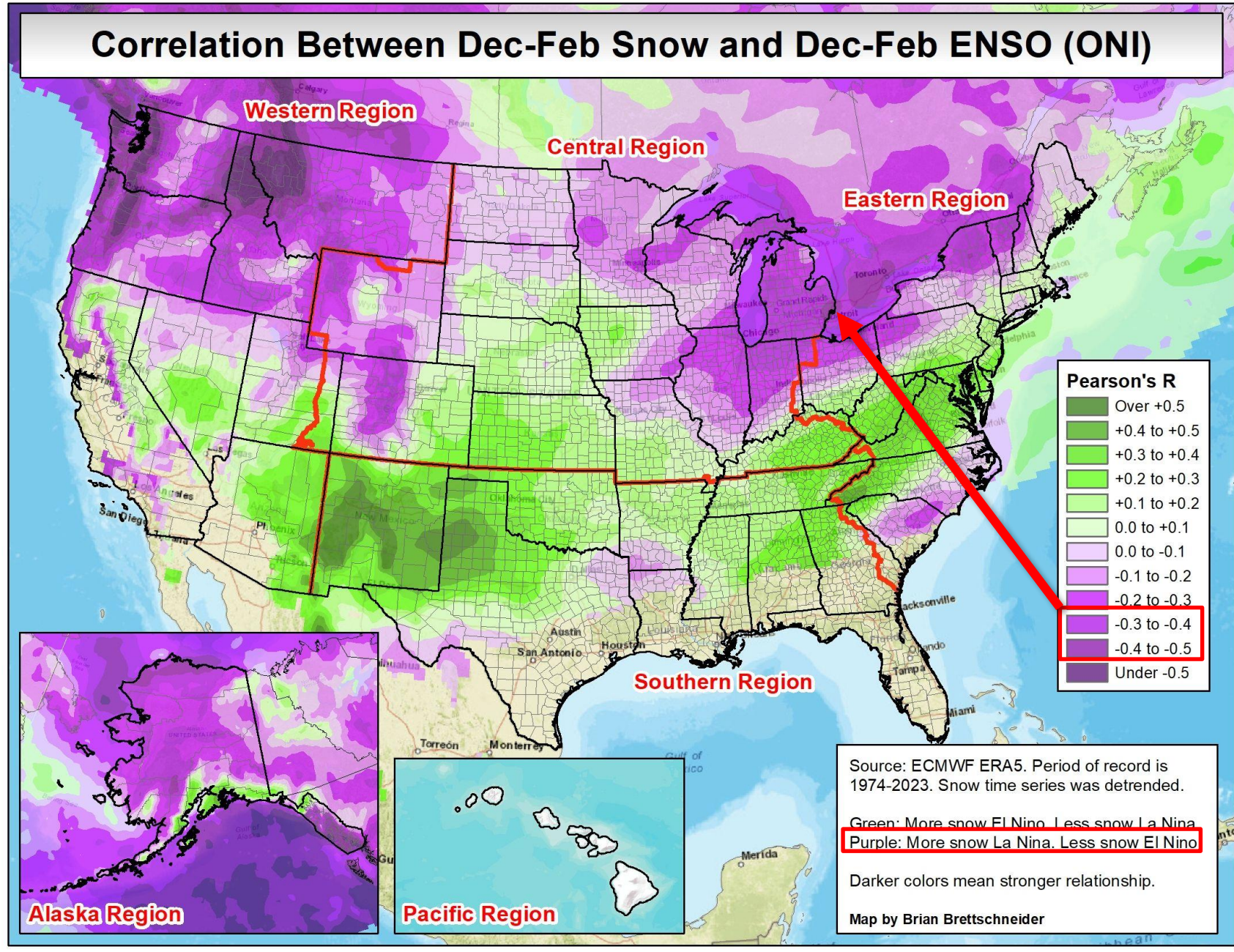




ENSO and Snowfall

2024-2025 Winter Outlook for SE MI

Correlation Between Dec-Feb Snow and Dec-Feb ENSO (ONI)



The graphic shows that there is a negative correlation between the [Oceanic Niño Index](#) and snowfall across the Great Lakes. This means that during La Niña winters, we have generally seen more snow than we have during El Niño winters.

This graphic accounts for trends in average winter snowfall over the years.



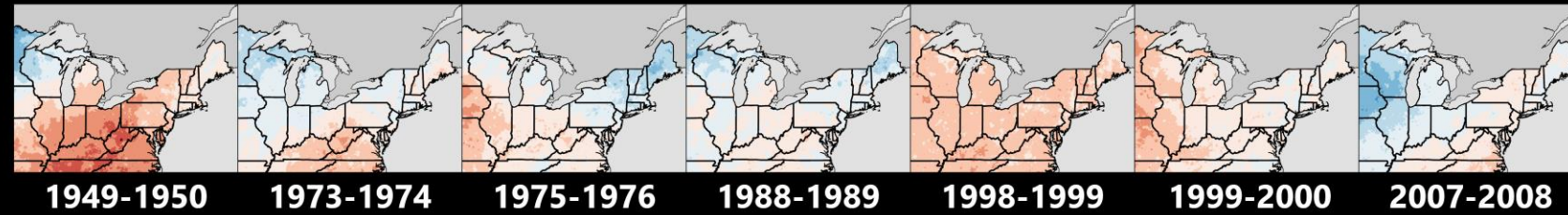


No Two La Niñas Are The Same

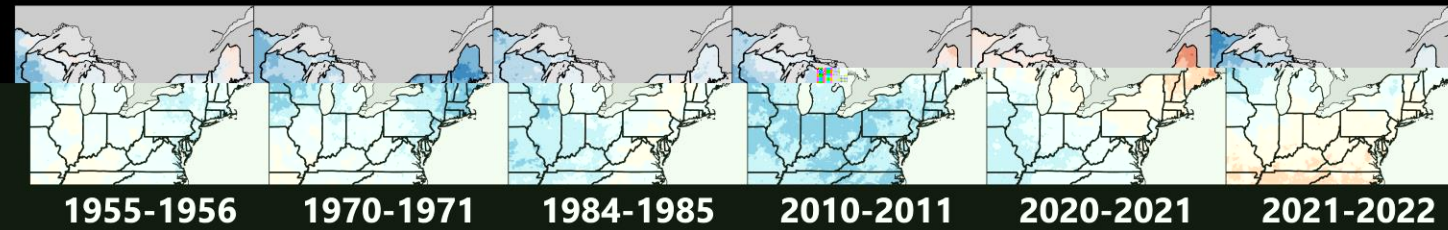
2024-2025 Winter Outlook for SE MI

LA NIÑA EVENTS: TEMPERATURE

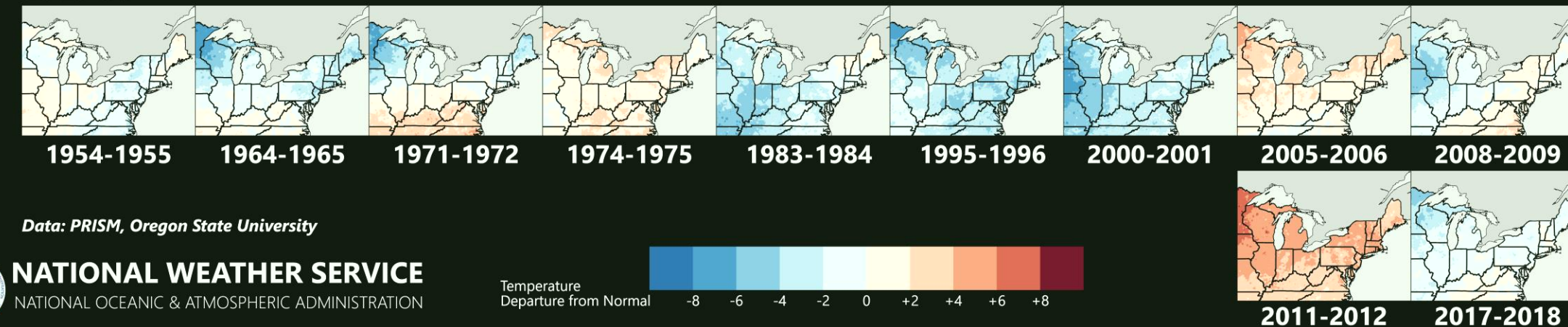
STRONG



MODERATE



WEAK



Data: PRISM, Oregon State University



NATIONAL WEATHER SERVICE
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION

Temperature
Departure from Normal



La Niña's effect on winter temperatures across the Great Lakes generally offers little forecast skill. These maps show how each La Niña winter played out across the region.

A weak La Niña is forecast this year.



National Oceanic and
Atmospheric Administration
U.S. Department of Commerce

National Weather Service
Detroit, MI

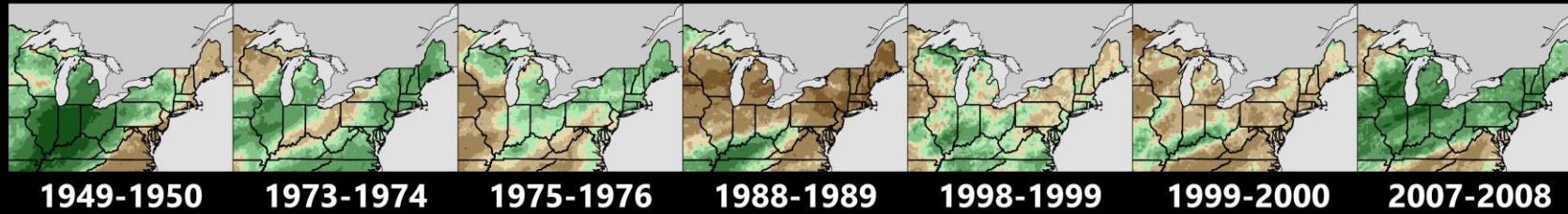


No Two La Niñas Are The Same

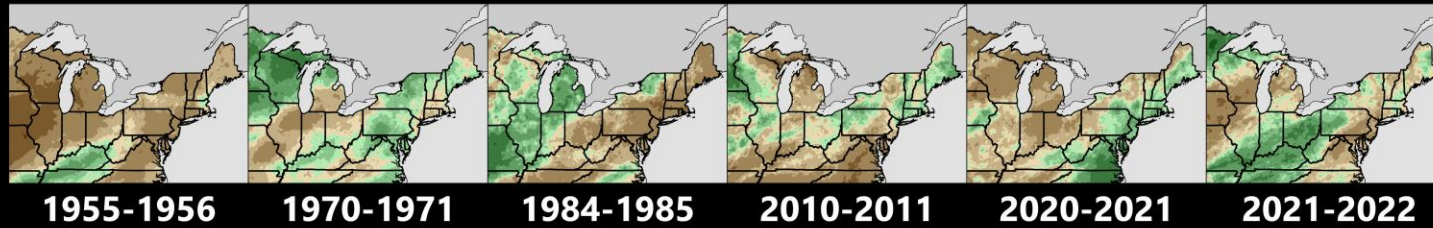
2024-2025 Winter Outlook for SE MI

LA NIÑA EVENTS: PRECIPITATION

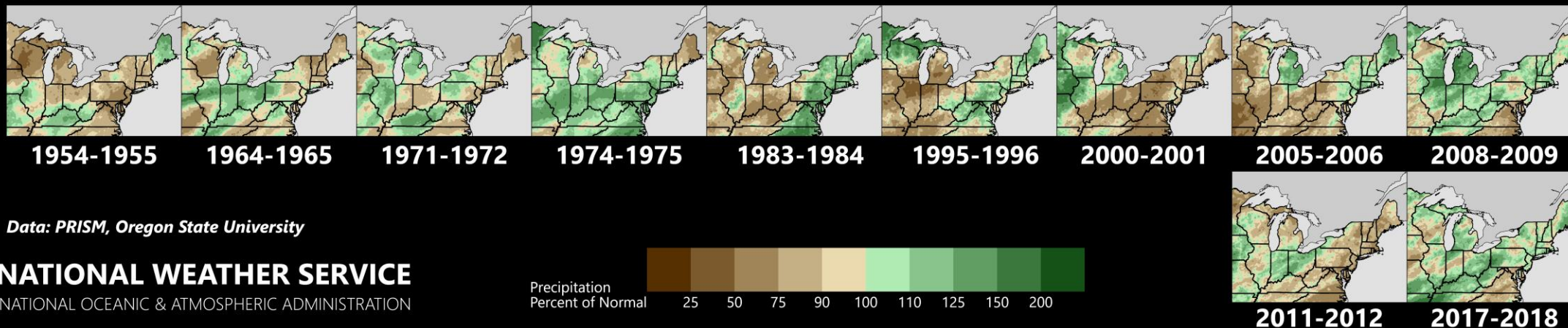
STRONG



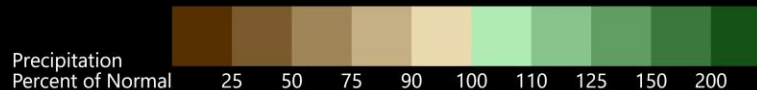
MODERATE



WEAK



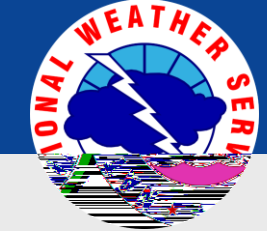
Data: PRISM, Oregon State University



La Niña's effect on winter precipitation has some predictability in the Great Lakes, but no two La Niñas are the same. These maps show how each La Niña winter played out across the region.


A weak La Niña is forecast this year.






Previous Weak La Niña Winter Stats

2024-2025 Winter Outlook for SE MI

	Normal Winter Avg Temp
Detroit	28.4
Flint	25.5
Saginaw	25.5


Observed Winter Avg Temp During Weak La Niñas (°F)												
1954-1955	1964-1965	1971-1972*	1974-1975	1983-1984*	1995-1996*	2000-2001	2005-2006	2008-2009	2011-2012*	2016-2017	2017-2018*	2022-2023
28.1	27.5	27.2	28.1	24.0	25.3	25.0	30.3	24.4	32.9	33.0	27.4	33.4
24.2	24.8	25.6	28.1	21.9	22.9	22.8	27.4	21.8	31.1	30.3	24.3	31.1
23.3	23.0	24.1	27.7	22.2	22.5	22.3	26.6	21.4	30.6	29.5	24.6	30.3

Below Normal
Near Normal
Above Normal

	Normal Winter Precipitation
Detroit	6.56
Flint	5.56
Saginaw	5.54

Observed Winter Precipitation During Weak La Niñas (inches)												
1954-1955	1964-1965	1971-1972*	1974-1975	1983-1984*	1995-1996*	2000-2001	2005-2006	2008-2009	2011-2012*	2016-2017	2017-2018*	2022-2023
5.90	8.42	6.07	9.55	5.87	4.46	6.20	8.47	7.29	7.70	6.89	7.11	8.38
5.45	6.18	6.68	7.25	2.93	4.42	7.96	7.19	6.32	5.85	7.14	7.26	5.14
5.17	8.41	7.09	5.91	3.15	5.58	6.58	6.17	7.57	4.55	5.88	4.96	6.13

Below Normal
Near Normal
Above Normal

	Normal Winter Snowfall
Detroit	35.4
Flint	39.5
Saginaw	37.1

Observed Winter Snowfall During Weak La Niñas (inches)												
1954-1955	1964-1965	1971-1972*	1974-1975	1983-1984*	1995-1996*	2000-2001	2005-2006	2008-2009	2011-2012*	2016-2017	2017-2018*	2022-2023
20.4	31.3	19.8	47.3	38.5	14.4	31.4	28.6	55.1	25.2	30.8	52.7	18.7
26.8	43.0	34.7	40.4	32.6	17.4	45.4	47.5	56.4	28.6	32.5	65.3	28.4
37.2	42.2	33.3	22.2	19.2	32.5	55.0	36.5	66.5	34.9	28.3	31.1	30.9

Below Normal
Near Normal
Above Normal

Years marked with a * indicate a La Niña event that reached moderate strength at some point in its evolution, but were weak during the winter (DJF) season.

These charts use the [NOAA NCEI 1991-2020 U.S. Climate Normals](https://www.noaa.gov/data/monitoring-assessments/analyses/seasonal-climate-normal).



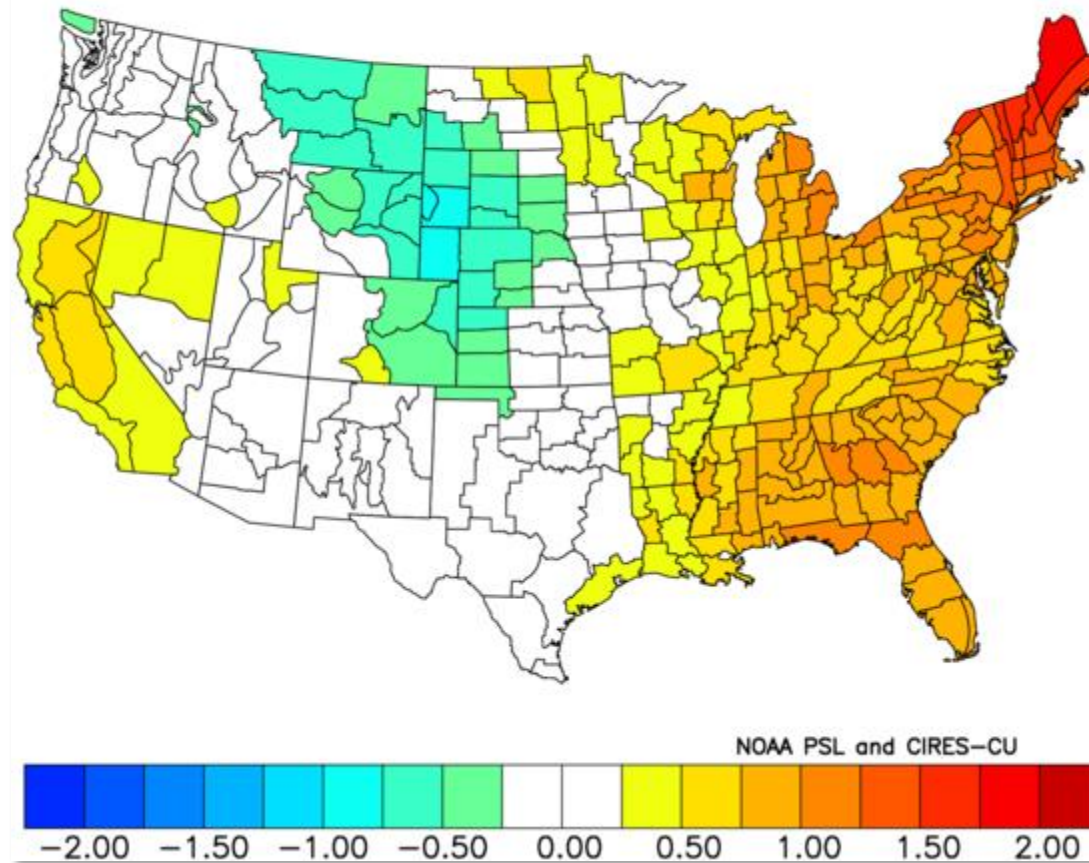
Trends in Recent Winters

2024-2025 Winter Outlook for SE MI

Beyond ENSO, a skillful predictor at the seasonal time scale is to account for how trends have evolved over the past 10 to 15 years. Composite anomalies of the past 15 years show that winters have trended warmer across Lower MI. Meanwhile, there is no strong signal for precipitation trends.

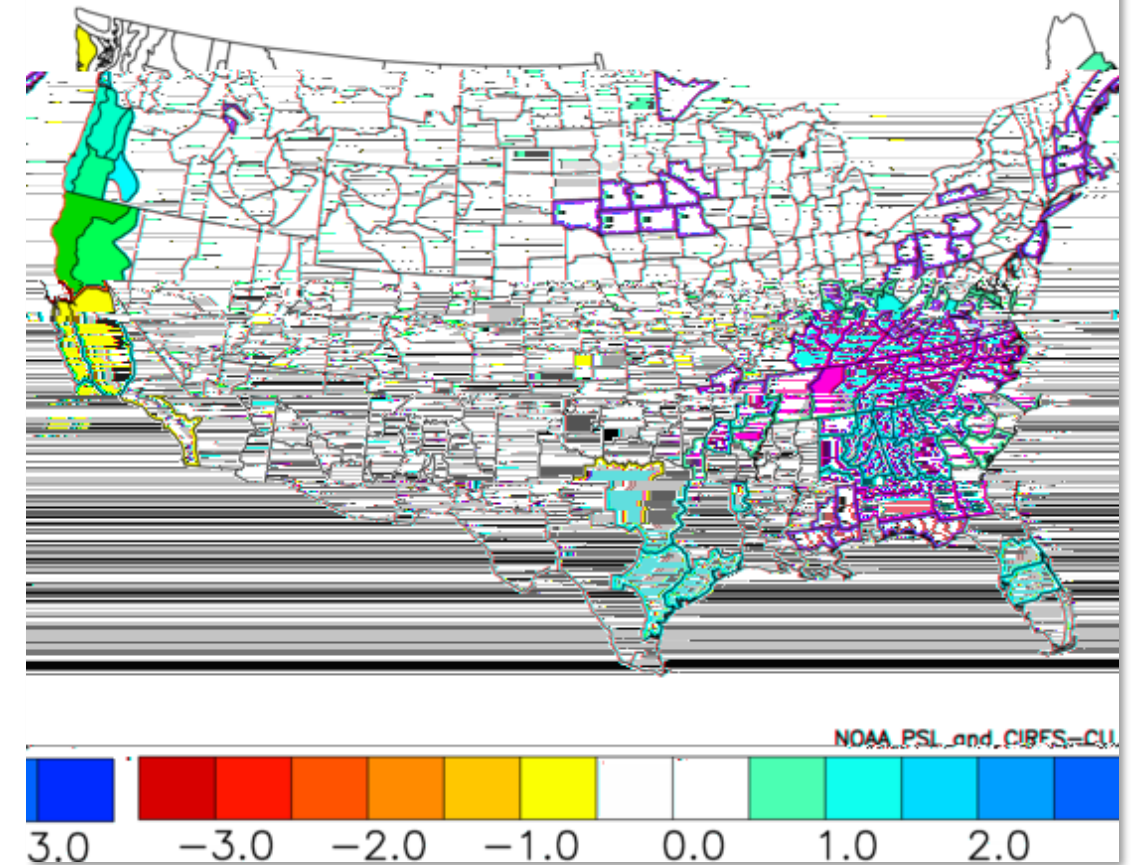
Temperature

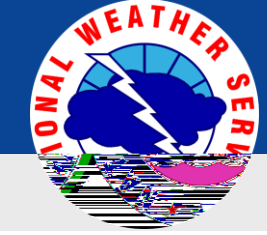
NOAA/NCEI Climate Division Composite Temperature Anomalies (F)
Dec to Feb 2009–10 to 2023–24
Versus 1991–2020 Longterm Average



Precipitation

NOAA/NCEI Climate Division Composite Precipitation Anomalies (in)
Dec to Feb 2009–10 to 2023–24
Versus 1991–2020 Longterm Average



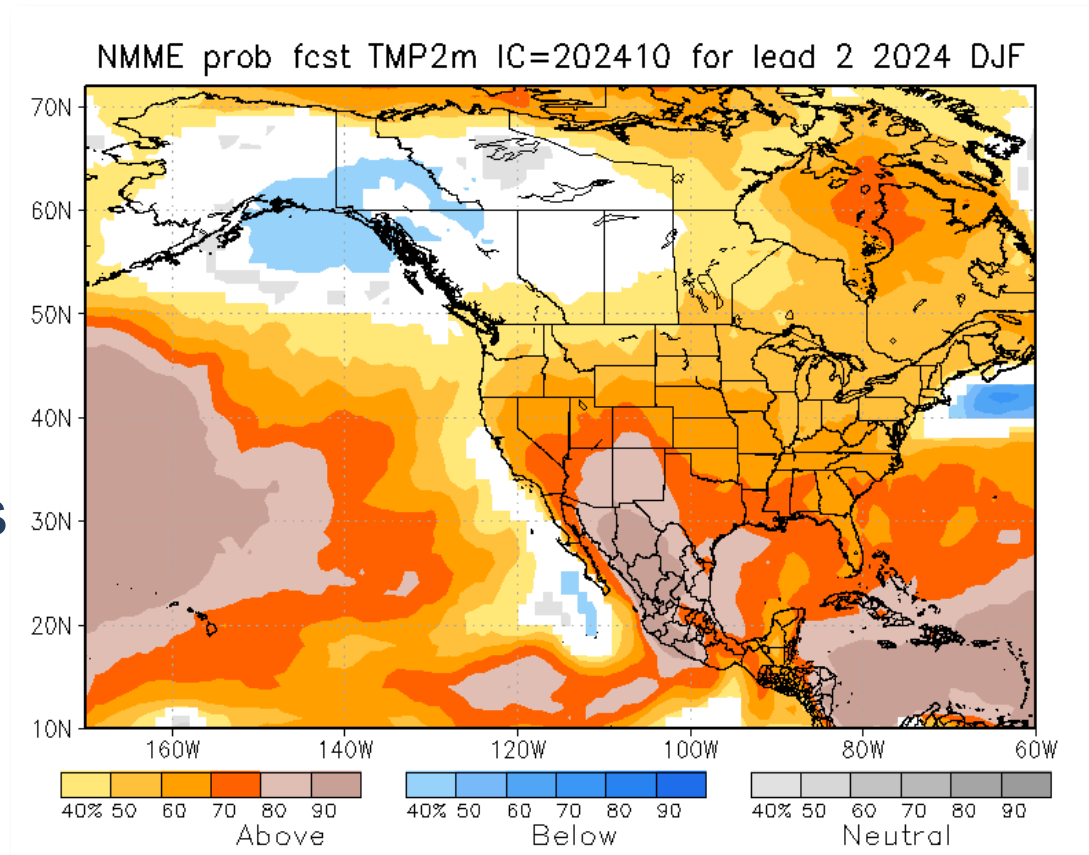


Model Ensemble Guidance

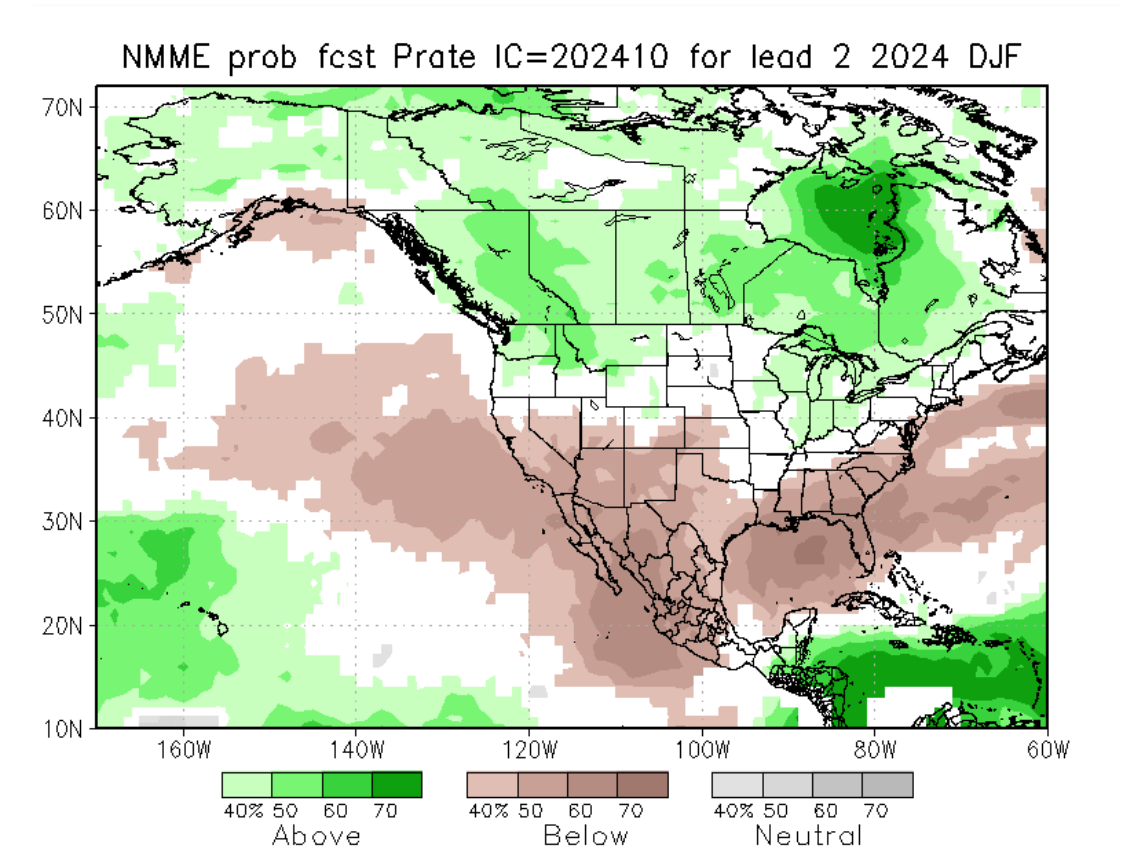
2024-2025 Winter Outlook for SE MI

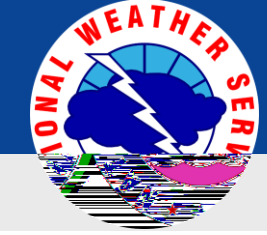
The North American Multi-Model Ensemble ([NMME](#)), a seasonal forecasting system featuring coupled models from US and Canadian modeling centers, is another tool that provides additional guidance to inform seasonal forecasts. The latest output offers increased probabilities for above normal temperatures and precipitation across the Great Lakes.

Temperature



Precipitation

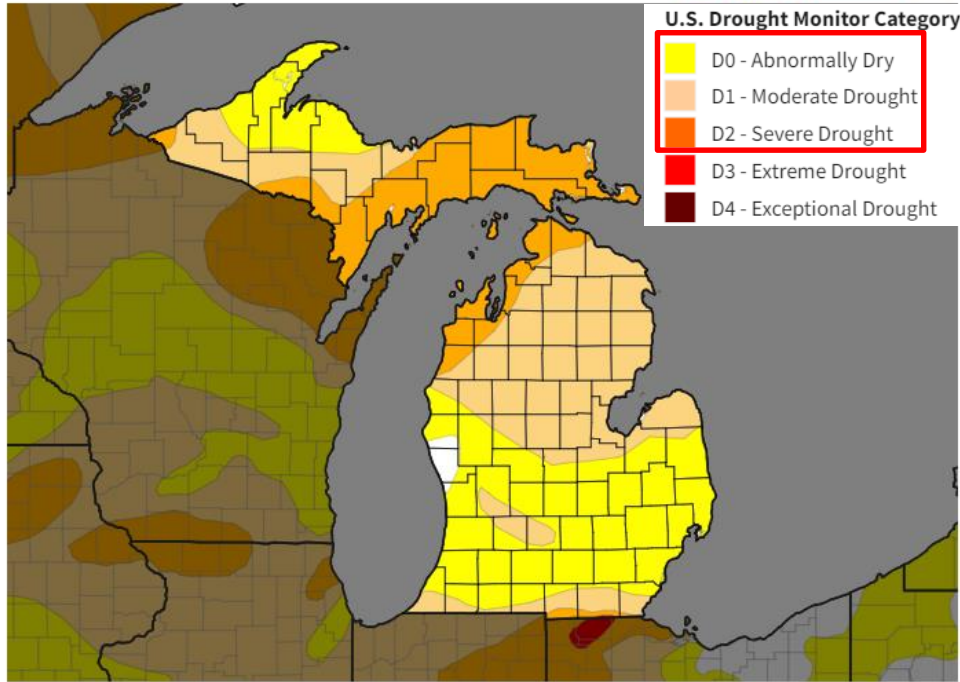




Current Drought Status and Seasonal Drought Outlook

2024-2025 Winter Outlook for SE MI

U.S. Drought Monitor: Michigan



Source(s): NDMC, NOAA, USDA
Updates Weekly: 10/15/24

Drought.gov

Abnormally dry to moderate drought conditions have developed for most of Southeast Michigan over the past month. Rainfall deficits over the past month range from around 0.50" to 1.50" below normal. Larger deficits exist for most of the area when looking farther back, with the exception of Flint which had its 10th wettest summer on record.

Recent Rainfall

Rainfall (Departure)	Detroit	Flint	Saginaw
1 Month Sep 16 to Oct 16	2.56" (-0.30")	1.81" (-1.19")	1.48" (-1.47")
3 Months Jul 16 to Oct 16	7.77" (-1.91")	8.52" (-0.93")	5.70" (-3.96")
6 Months Apr 16 to Oct 16	17.70" (-2.33")	20.44" (+1.01")	13.77" (-5.60")
9 Months Jan 16 to Oct 16	25.06" (-2.08")	26.70" (+1.19")	19.52" (-6.08")
1 Year Oct 16, 2023 to Oct 16, 2024	31.50" (-2.90")	33.93" (+1.87")	25.49" (-6.72")

U.S. Seasonal (3-Month) Drought Outlook



Valid for October 17, 2024 - January 31, 2025
Released October 17, 2024

Drought.gov

Due to higher probabilities for a wet winter, drought is forecast to improve through January.



National Oceanic and Atmospheric Administration
U.S. Department of Commerce

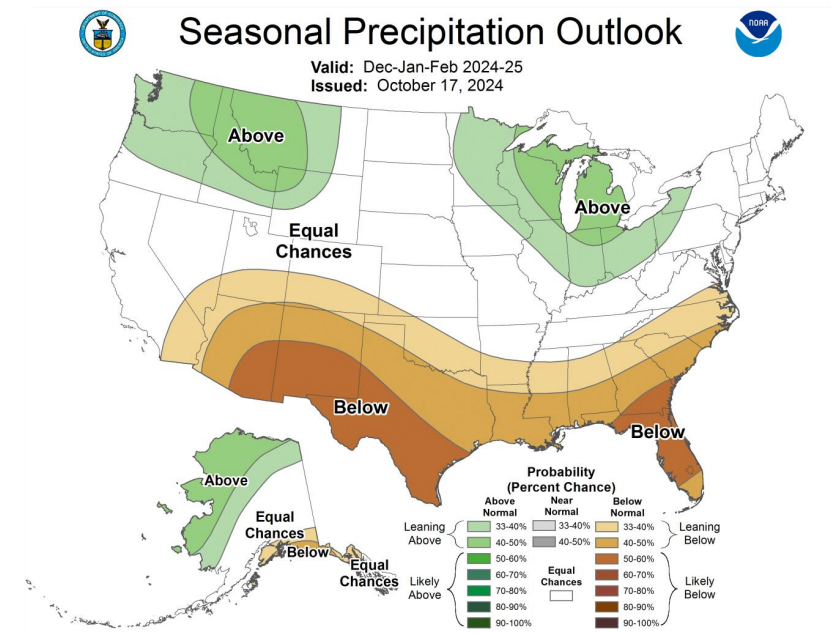
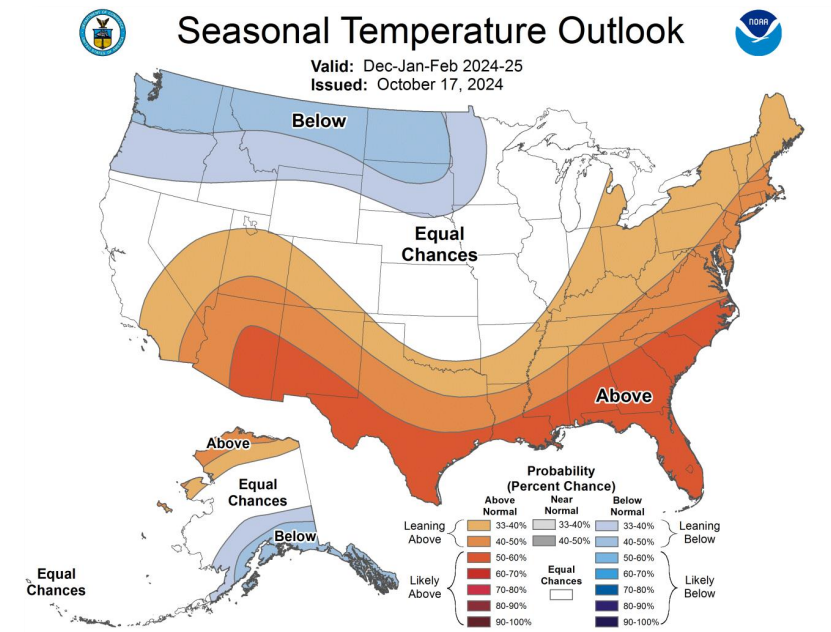
National Weather Service
Detroit, MI

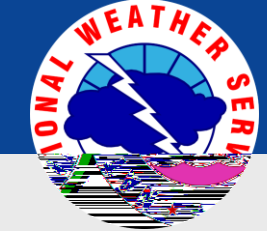


Outlook Summary

2024-2025 Winter Outlook for SE MI

- La Niña is expected to be a primary driver of the upper air pattern this winter and the outlook is based heavily upon the typical impacts.
- La Niña often (but not always) results in wetter than normal winters for Southeast Michigan. Thus, probabilities lean towards **above normal precipitation**.
 - Note: This is not a snowfall outlook, but above normal precip could favor above normal snowfall if the precip events occur during cooler episodes.
- Observed trends over recent years are also accounted for in these outlooks, which show Southeast Michigan winters have trended warmer. The outlook leans toward **above normal temperatures**.
- Ensemble model guidance advertises increased probability for above normal temperatures and precipitation, providing additional confidence.
- Despite odds favoring a warmer and wetter winter overall, that does not rule out cold outbreaks, dry streaks, and periods of heavy snow which remain a possibility like in any other winter.
- Drought conditions are forecast to improve over the winter.





Winter Records and Trivia – Temperature

2024-2025 Winter Outlook for SE MI

Normal High Temp	December	January	February	Winter (DJF)
Detroit	37.2	32.3	35.2	34.9
Flint	34.9	29.9	32.8	32.6
Saginaw	34.7	29.5	31.8	32.0

Normal Low Temp	December	January	February	Winter (DJF)
Detroit	25.3	19.2	20.8	21.8
Flint	22.5	16.0	16.7	18.4
Saginaw	23.1	16.4	17.3	18.9

Warmest...	Temperature	Month	Winter (DJF)
Detroit	73 (2/27/2024)	41.1 (Dec. 2015)	37.0 (1881 – 1882)
Flint	74 (2/27/2024)	41.0 (Dec. 2015)	34.0 (2023 – 2024)
Saginaw	74 (2/27/2024)	39.1 (Dec. 2015)	33.2 (2023 – 2024 & 1931 – 1932)

Coollest...	Temperature	Month	Winter (DJF)
Detroit	-21 (1/21/1984)	12.2 (Feb. 1875)	18.7 (1903 – 1904)
Flint	-25 (2/20/2015 & 1/18/1976)	10.9 (Jan. 1977)	16.9 (1976 – 1977)
Saginaw	-23 (2/5/1918)	9.4 (Jan. 1912)	15.7 (1962 – 1963)

Normal number of days per winter with a min temp at or below 0 degrees: Detroit: 3.4; Flint: 8.7; Saginaw: 6.5

All temps in °F; normals reflect 1991-2020 period



Winter Records and Trivia – Precipitation & Snowfall

2024-2025 Winter Outlook for SE MI

Normal Precipitation	December	January	February	Winter (DJF)
Detroit	2.25"	2.23"	2.08"	6.56"
Flint	1.89"	1.99"	1.68"	5.56"
Saginaw	1.85"	1.92"	1.77"	5.54"

Normal Snowfall	December	January	February	Winter (DJF)
Detroit	8.9"	14.0"	12.5"	35.4"
Flint	11.4"	15.1"	13.0"	39.5"
Saginaw	11.8"	13.9"	11.4"	37.1"

Wettest...	Month	Winter (DJF)
Detroit	6.41" (Feb. 1881)	12.74" (1949 – 1950)
Flint	5.28" (Feb. 1954)	10.48" (1949 – 1950)
Saginaw	6.10" (Feb. 1997)	11.95" (1996 – 1997)

Snowiest...	Month	Winter (DJF)
Detroit	39.1" (Jan. 2014)	78.0" (2013 – 2014)
Flint	35.3" (Dec. 2000)	71.6" (2013 – 2014)
Saginaw	40.2" (Dec. 2000)	75.7" (2007 – 2008)

Driest...	Month	Winter (DJF)
Detroit	0.04" (Feb. 1877)	2.24" (2002 – 2003)
Flint	0.07" (Jan. 1945)	1.51" (1962 – 1963)
Saginaw	0.21" (Feb. 1969)	1.86" (1941 – 1942)

Least Snowy...	Month	Winter (DJF)
Detroit	0.0" (Dec. 1889)	5.6" (1889 – 1890)
Flint	T (Jan. 1934)	5.8" (1936 – 1937)
Saginaw	T (Feb. 1987 & Dec. 1943)	5.6" (1941 – 1942)