



# Subseasonal Forecasts and Applications for West Michigan's Transportation Sector

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# Evolution of 8-14 Day IDSS for Transportation

At NWS Grand Rapids

**Pilot Project Period**  
**(Kent County)**

**Expansion**  
**(22 More Counties)**

?

**2022-2023 Winter**

**2023 Spring thru Fall**

**2023-2024 Winter**

**Beyond...**

**Weekly emailed outlook**

- > Three Slide Briefing
- > 8-14 Day Temp/Precip
- > 8-14 Day Hazards
- > Ensemble Forecasts
- > Bulleted Discussion

**Weekly emailed outlook**

- > Same Format
- > New Focus Areas
- > CPC Heat Index
- > Thunderstorm Risk
- > Heavy Rain Probability

**Weekly emailed outlook**

- > CPC Wind Chill
- > Snow Type Forecast
- > System vs. Lake Effect
- > Wind Information
- > Travel Impacts

**Periodically obtain stakeholder feedback**

**In person meetings with stakeholders (NWS goes to visit partners)**

**Add additional partners (agriculture, water resources, etc.)**



# Summarizing the Pilot Project

With Kent County Transportation Officials

## 2022-2023 Winter Highlights

- Three significant winter storms, with a forecast signal for each
- Two lake effect snow events totaling 24"-54"
- Ice storm and heavy snow with 800,000 customers losing power

## Diagnostic Tools

- CPC 8-14 Day Temperature, Precipitation, and Hazards Outlooks
- Ensemble forecasts (ECE, GEFS, CMC) via WeatherBell Analytics

## Partner Feedback

- Worker shifts adjusted over a week ahead of a winter storm
- Worker activities planned out
- Positive feedback on the utility and design of outlooks



Courtesy of Michigan State Police





# Summarizing the Pilot Project (Cont.)

With Kent County Transportation Officials

## 2022-2023 Winter: Point Verification at Grand Rapids (Kent County) (*Special thanks to Natalie Vernon, Pathways Intern*)

- CPC 8-14 Day Temperature: 19/20 outlooks verified in category or one category away
- CPC 8-14 Day Precipitation: 16/20 outlooks verified in category or one category away
- CPC 8-14 Day Hazard Outlook: 2/2 Much Below Normal Temperatures verified
- CPC 8-14 Day Hazard Outlook: 4/5 Heavy Snow outlooks verified

## 2023 Spring, Summer, and Fall

- Focus: Heat risk, heavy rain, thunderstorms
- Fall: Added probability of freezing/subfreezing temperatures

## Partner Applications (non-Winter)

- Outdoor work planning, sharing with Parks & Recreation Department
- CPC Heat Index information used to preplan bottle water distribution for workers



# **Current Outlook Format For Expansion Phase (23 Counties in Michigan)**

# Email Body Format (recent example, issued January 8, 2024 )

## **NWS Extended Outlook: January 16-22**

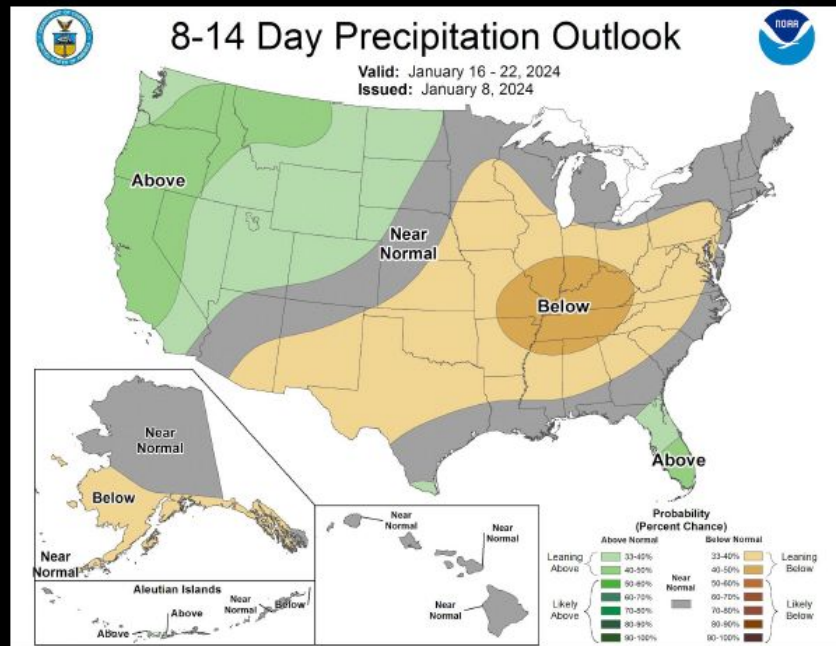
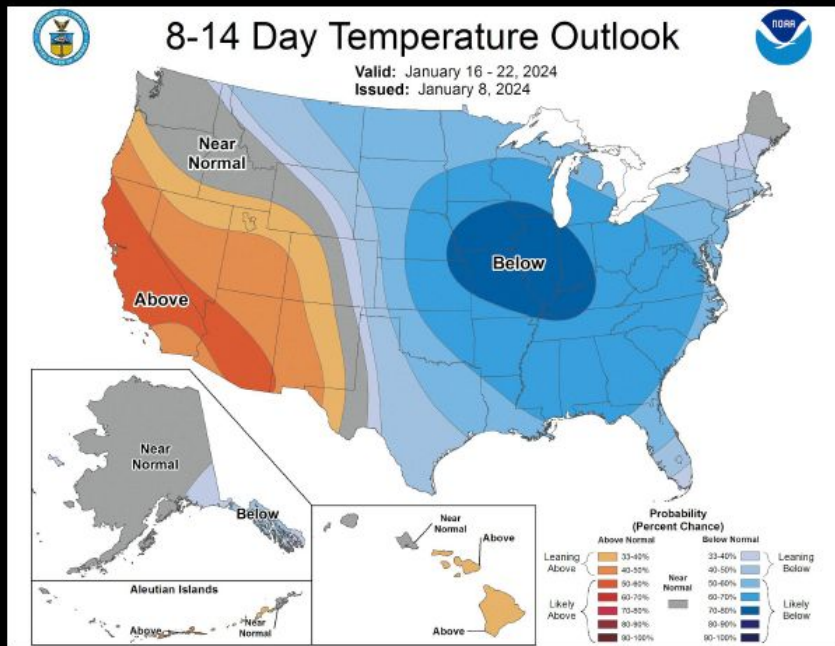
- Below normal temperatures are likely (normal highs: Upper 20s to Low 30s)
- Highs in the teens to low 20s will likely dominate most of this period
- Highs below 10 are possible around January 16 (away from Lake Michigan)
- Wind chill values down to -20F or colder are likely at times
- A prolonged, multi-day lake effect snow event is possible in this pattern
- Travel conditions near/west of US 131 will be most impacted
- Snow will be powdery given the cold temperatures



# Temperature & Precipitation Outlook

January 8, 2024  
4:05 PM

January 16-22, 2024



<u>Forecast</u>	<u>Normal Highs</u>	<u>Normal Lows</u>
Below Normal Temperatures are Likely	Upper 20s to Low 30s	10 to 15

<u>Forecast</u>	<u>Normal Precip</u>
Odds Favor Near Normal Precipitation	0.40" - 0.60"







# Temperature, Snowfall, & Travel Information

January 8, 2024

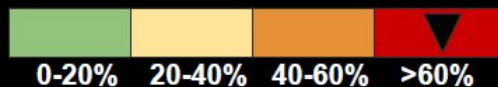
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January 16-22, 2024

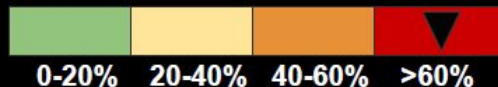


## Temperature Probabilities

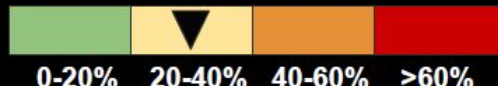
### Highs Below 32°F



### Highs Below 20°F



### Highs Below 10°F



## Weather Threats

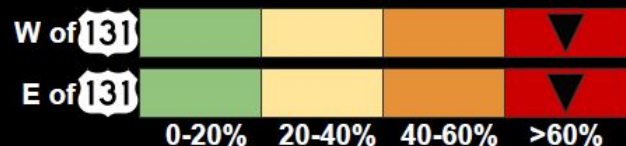
	Probability Category
Rain	Low
Mixed Precipitation	Low
Lake Effect Snow	High
Storm System Snow	Medium
Winds Over 30 MPH	Medium

## Travel Impacts

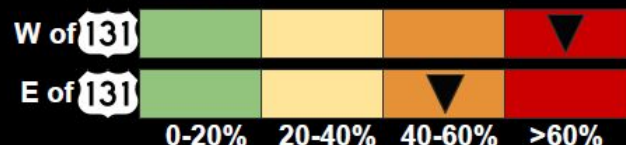
	Probability Category
Minor ( <i>Inconvenient</i> )	High
Moderate ( <i>Disruptive</i> )	Medium
Major ( <i>Very Disruptive</i> )	Low

## Snowfall Probabilities

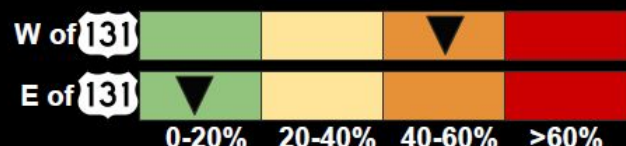
### Any Accumulating Snow



### At Least 4"



### At Least 8"







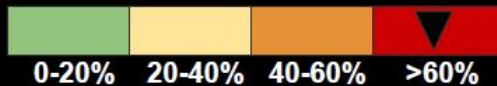
# Extreme Cold, Wind Chill, & Heavy Snow Risk

January 8, 2024  
4:05 PM

January 16-22, 2024

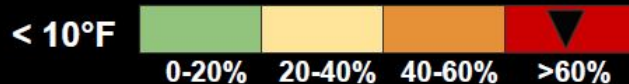
## Extreme Cold

The probability of experiencing temperatures cold enough to rank in the top 15% for this time of year



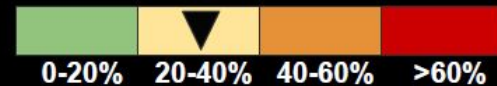
## Lowest Wind Chill

Combines the effects of temperature and wind



## Heavy Snow

The probability of receiving snow accumulations that rank in the top 15% for this time of year



## Timeframe

January 16-17

## Location

Central and Southern Lower Michigan

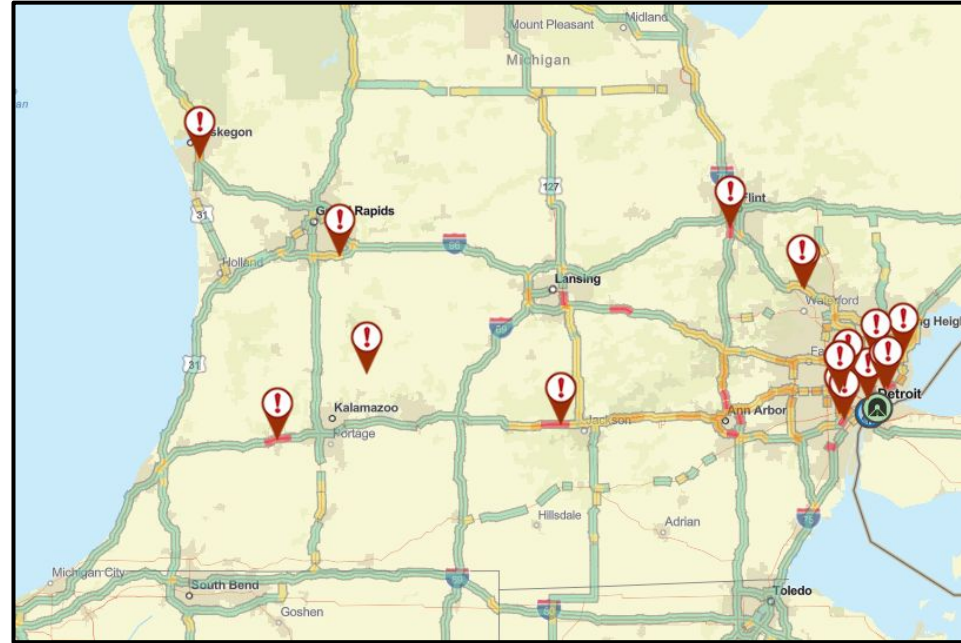




# Partner Application - 2023-2024 Winter

Examples Shared with the NWS

- Schedule and set up equipment for upcoming storms of any nature
- Copies of briefings printed out in break rooms
- Management teams discuss them weekly at staff meetings (plan snow plowing or project work)



MDOT Travel Speeds and Incidents

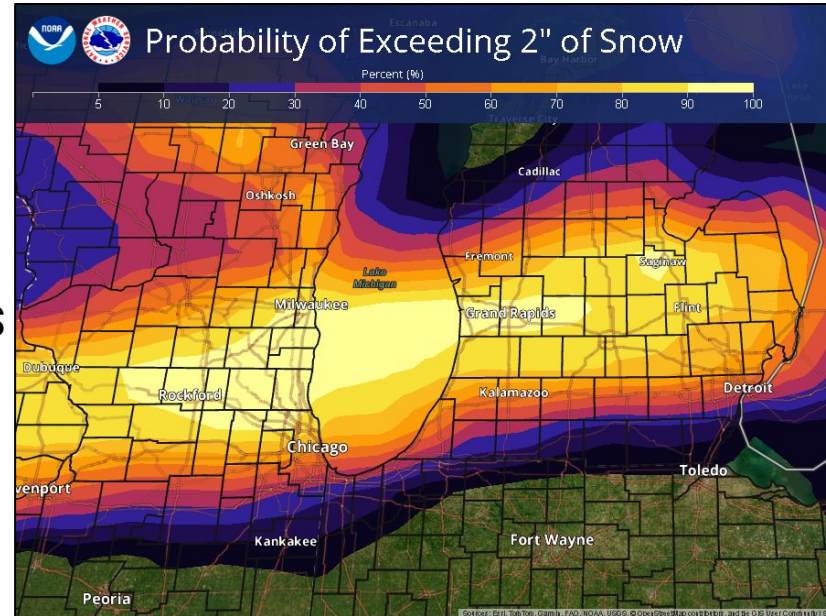




# Next Steps

## Partner Engagement & Science Development

- Visit with county transportation officials
- Revise outlook content based on meetings
- Consider additional partners to include
- Utilization of NWS DESI?
  - Dynamic Ensemble-based Scenarios for IDSS
  - <https://desi.noaa.gov/>
  - Potential utility in the 8-10 day timeframe (192-240 hours)
  - Excellent looking graphics for partner utility



NWS DESI Graphic





## Thank you for listening!

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