

# USACE: EMERGENCY MANAGEMENT

**John Osterhage, P.E.**  
**Chief, Emergency Management**  
**St. Louis District**

*"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."*



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# EMERGENCY MANAGEMENT CONTACTS

Chief, Readiness Branch

[John.L.Osterhage@usace.army.mil](mailto:John.L.Osterhage@usace.army.mil)

John Osterhage  
(314) 331-8569

ICW Program

[Jeremy.L.Eck@usace.army.mil](mailto:Jeremy.L.Eck@usace.army.mil)

Jeremy Eck  
(314) 331-8568

National Emergency Preparedness Program

[Matthew.P.Collins@usace.army.mil](mailto:Matthew.P.Collins@usace.army.mil)

Matt Collins  
(314) 331-8566

FCCE Program

[Cathy.VanArsdale@usace.army.mil](mailto:Cathy.VanArsdale@usace.army.mil)

[Jennifer.L.Wilson@usace.army.mil](mailto:Jennifer.L.Wilson@usace.army.mil)

Cathy Van Arsdale  
(314) 331-8570  
Jennifer Wilson

Emergency Management Specialist

[Jennifer.R.Moehlmann@usace.army.mil](mailto:Jennifer.R.Moehlmann@usace.army.mil)

Jennifer Moehlmann  
(314) 331-8567

**Emergency Operations Center**

<http://www.mvs.usace.army.mil/Missions/Emergency-Operations/>

**(314) 331-8605**

**USACE Water Control**

<http://www.mvs-wc.usace.army.mil/>

**(314) 331-8342**



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# Illinois Emergency Management Agency



Flood Preparedness Workshop

Name: Bob Flemming

Date: January 30, 2019



# IEMA

- Illinois Emergency Management Agency
  - Region 6
  - 2200 South Dirksen Parkway
  - Springfield, IL 62703
  - Office Phone Number 217-782-0922
  - After Hours Phone Number: 217-782-7860





# IEMA

- The Regional Offices work directly with:
  - County and Accredited Local EMA programs
    - Maintains contact with EMA prior to any flooding
    - May work from Local EOC during initial flooding
    - Coordinates information flow to either the State Unified Area Command or the State EOC



# IEMA

- Request for Resources
  - Any request for State resources must go through the County EMA to the Regional Office or the Agency Duty Officer then forwarded to the State EOC or State Unified Command if one is established
  - Resource being requested should be utilized for protecting Critical Infrastructure (hospital, major roadway, water treatment plant, etc.)



# IEMA

- Request for Resources (cont.)
  - Resource request should include what the Local EMA wants to accomplish (IEMA staff and partner agencies at the State EOC will be able to assist in determining the appropriate resource to address the problem)



# IEMA

- During and After the Flood – Document!
- Public Assistance Cost Tabulation Forms
  - Local EMA may forward a PA Cost Tabulation form to other units of Government to record the costs associated with the response activities related to the flooding event
  - Vital that units of Government complete this form (aids in determination to make a request for a Presidential Declaration)



# IEMA

- Public Assistance Cost Tabulation Forms (cont.)
  - While your specific County may not meet the PA dollar threshold, it may contribute to meeting the State dollar threshold
  - Hyperlink provided below to the PA Form

[https://www2.illinois.gov/iema/LocalEMA/Documents/PAforms/PA\\_DamageAssessment.pdf](https://www2.illinois.gov/iema/LocalEMA/Documents/PAforms/PA_DamageAssessment.pdf)





# IEMA

- Disaster Impact Assessment Form
  - Local EMA, partner organizations and impacted municipalities should also complete a Disaster Impact Assessment form
  - Along with the numbers the form helps to “Tell the Story” and provides an overview how the flood impacted the jurisdiction
  - Hyperlink provided below for the form

<https://www2.illinois.gov/iema/LocalEMA/Documents/PAforms/DisasterImpactForm.pdf>





# IEMA

- Know your County Emergency Manager and Staff
  - Do not let the time of disaster be the first time you meet your Emergency Management Agency
  - Know Mutual Aid organizations that can assist your community
  - Understand the Disaster Process and how resources are requested from the State if local resources are exhausted



# Contact Information

Bob Flemming  
Bureau of Operations  
Illinois Emergency Management Agency  
Office: 217-782-0922  
After Hours: 217-782-7860  
Email: Robert.L.Flemming3@Illinois.gov

[www.ready.illinois.gov](http://www.ready.illinois.gov)



# **BRIEFING TO USACE DRAINAGE AND LEVEE DISTRICTS OLD MONROE, MISSOURI**

## **February 19, 2019**

**Mark Fuchs  
Service Hydrologist  
National Weather Service  
WFO St. Louis, MO**



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# OUTLINE

Winter Precipitation

Soil Moisture

Current Streamflow

Current Drought Status

Forecast Rainfall

Spring Flood Outlook

Contingency Forecasts

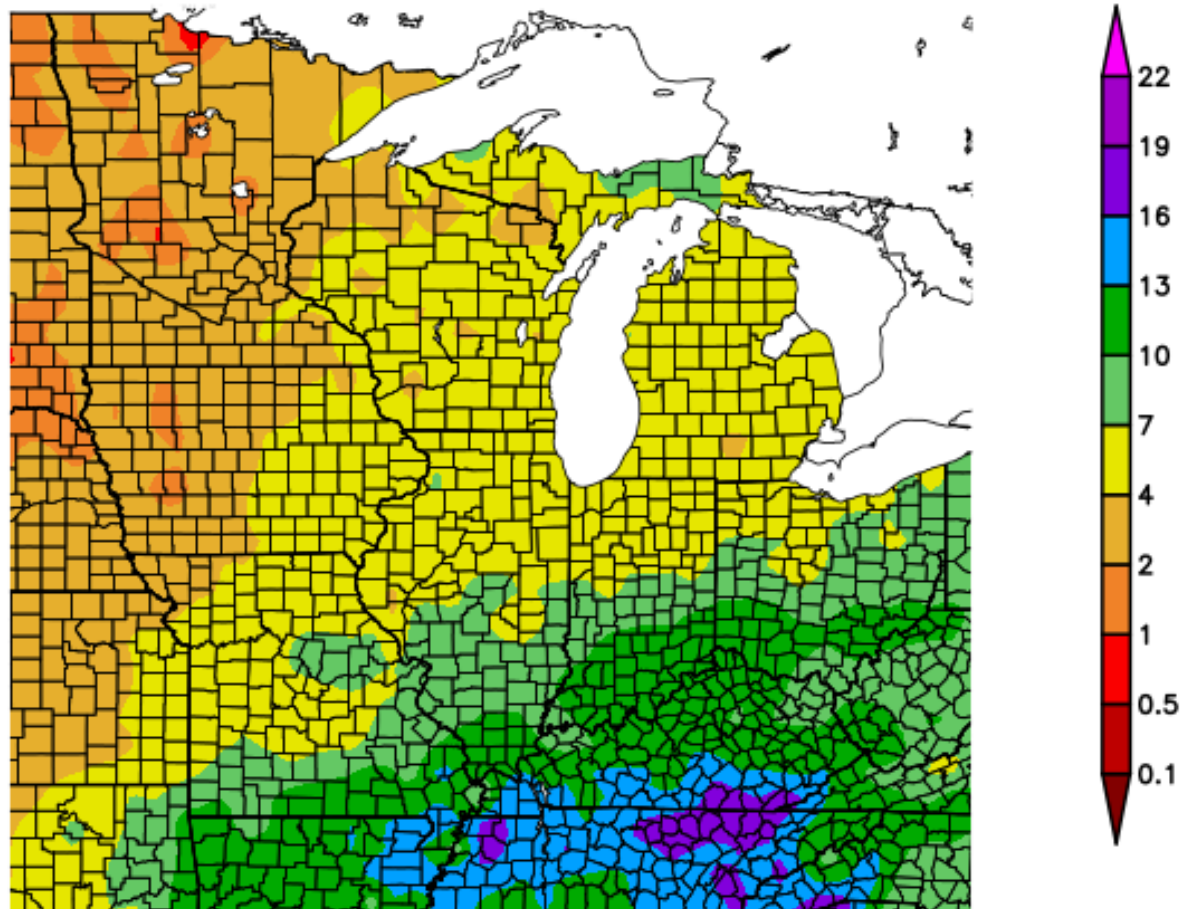


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# PRECIPITATION SINCE DECEMBER 21

Precipitation (in)  
12/21/2018 – 2/18/2019



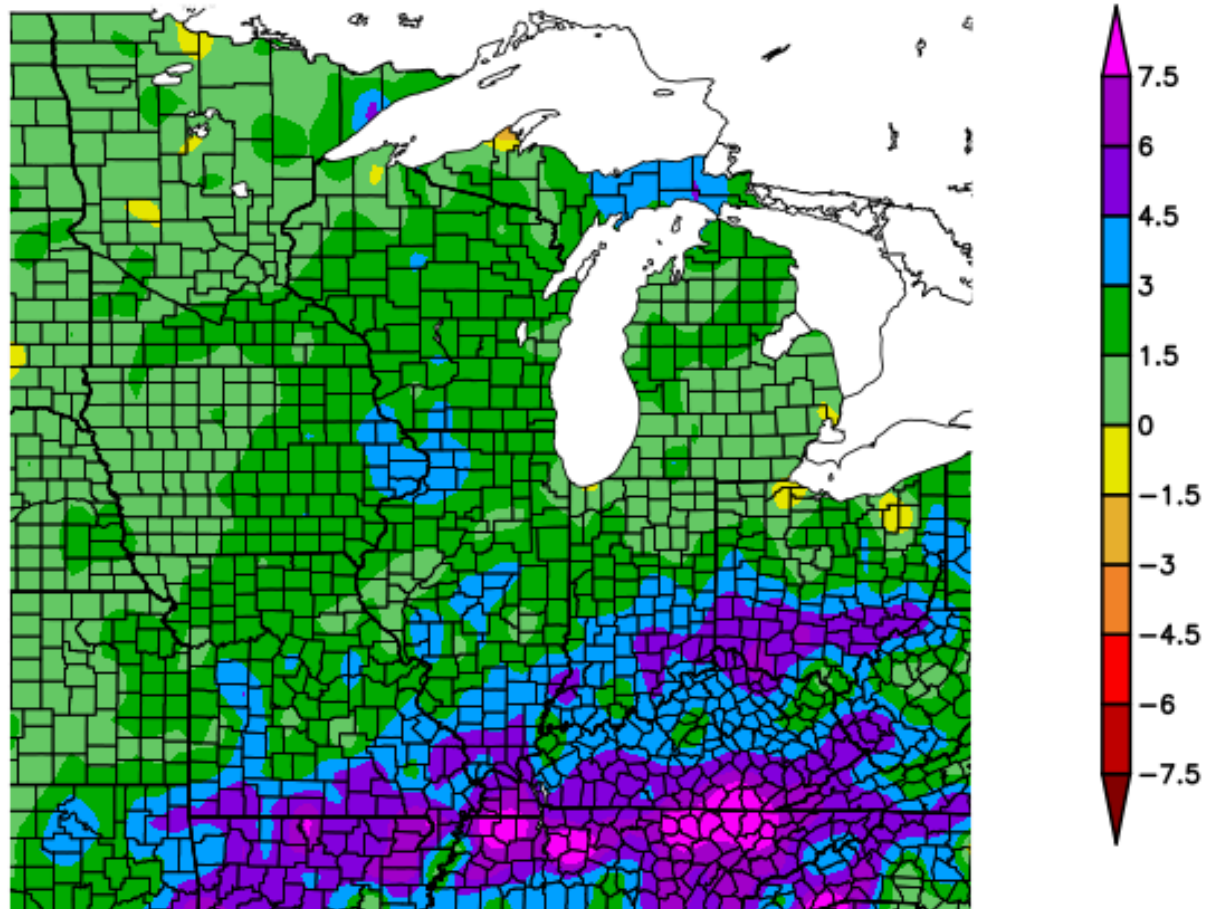
Generated 2/19/2019 at HPRCC using provisional data.

NOAA Regional Climate Centers  
of Engineers



# PRECIPITATION SINCE DECEMBER 21

Departure from Normal Precipitation (in)  
12/21/2018 – 2/18/2019



Generated 2/19/2019 at HPRCC using provisional data.

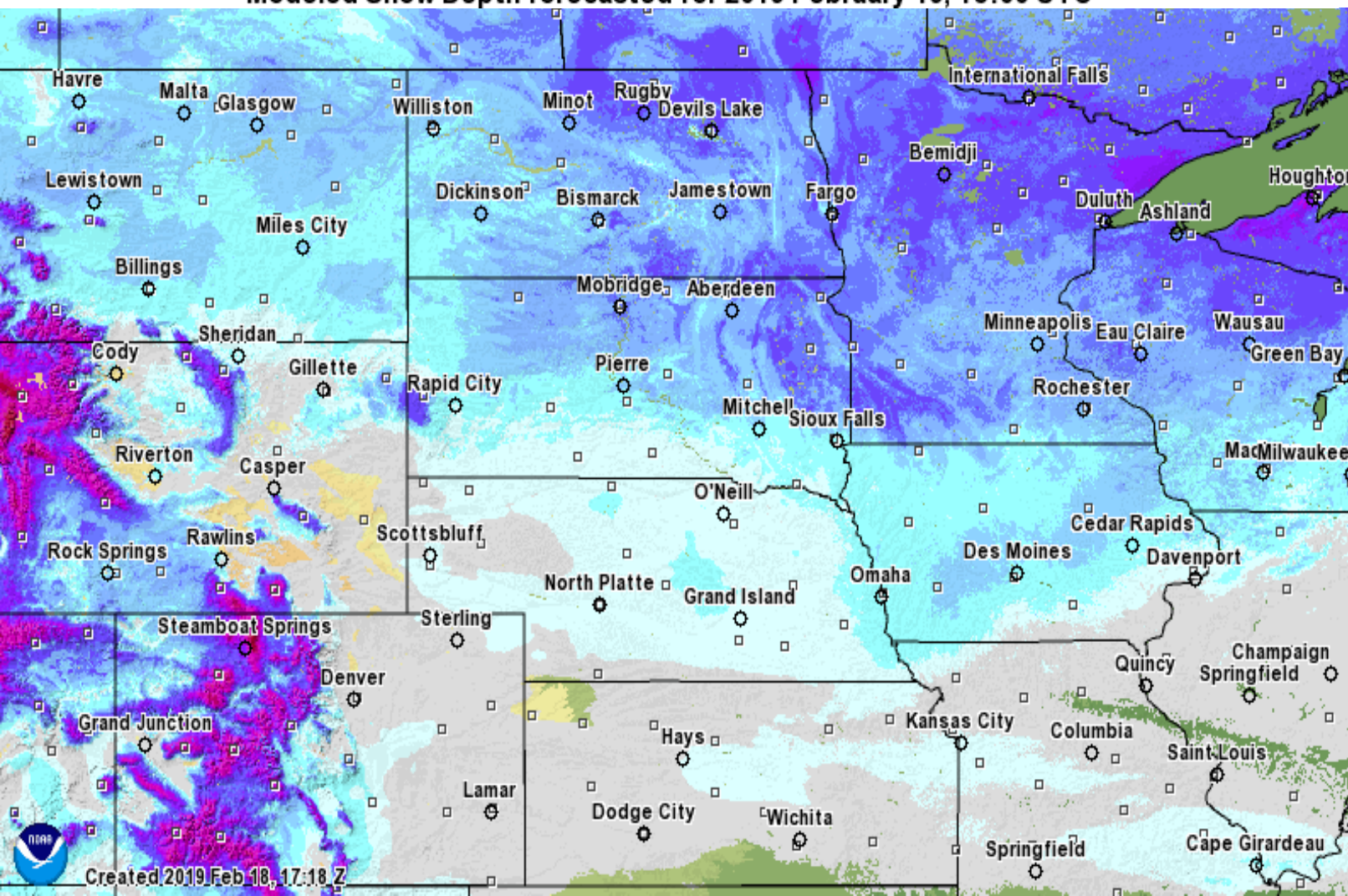
NOAA Regional Climate Centers  
of Engineers



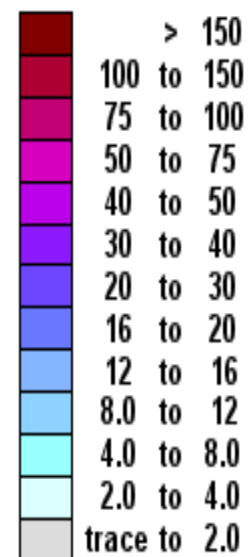


# SNOW DEPTH

Modeled Snow Depth forecasted for 2019 February 19, 16:00 UTC

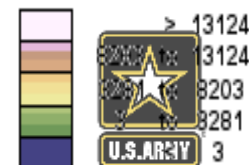


Inches of depth



Not Estimated

Elevation in feet

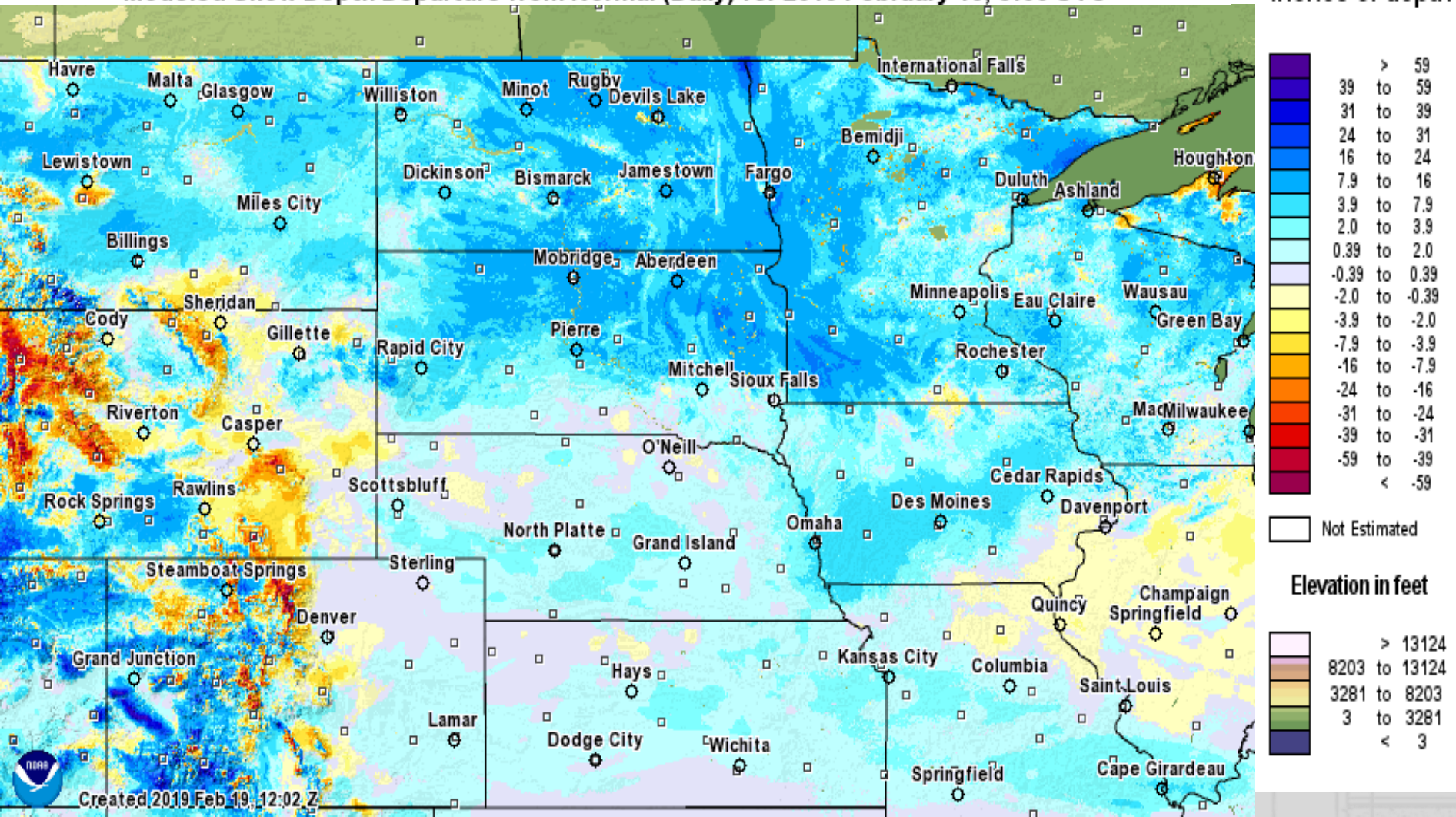


Created 2019 Feb 18, 17:18 Z



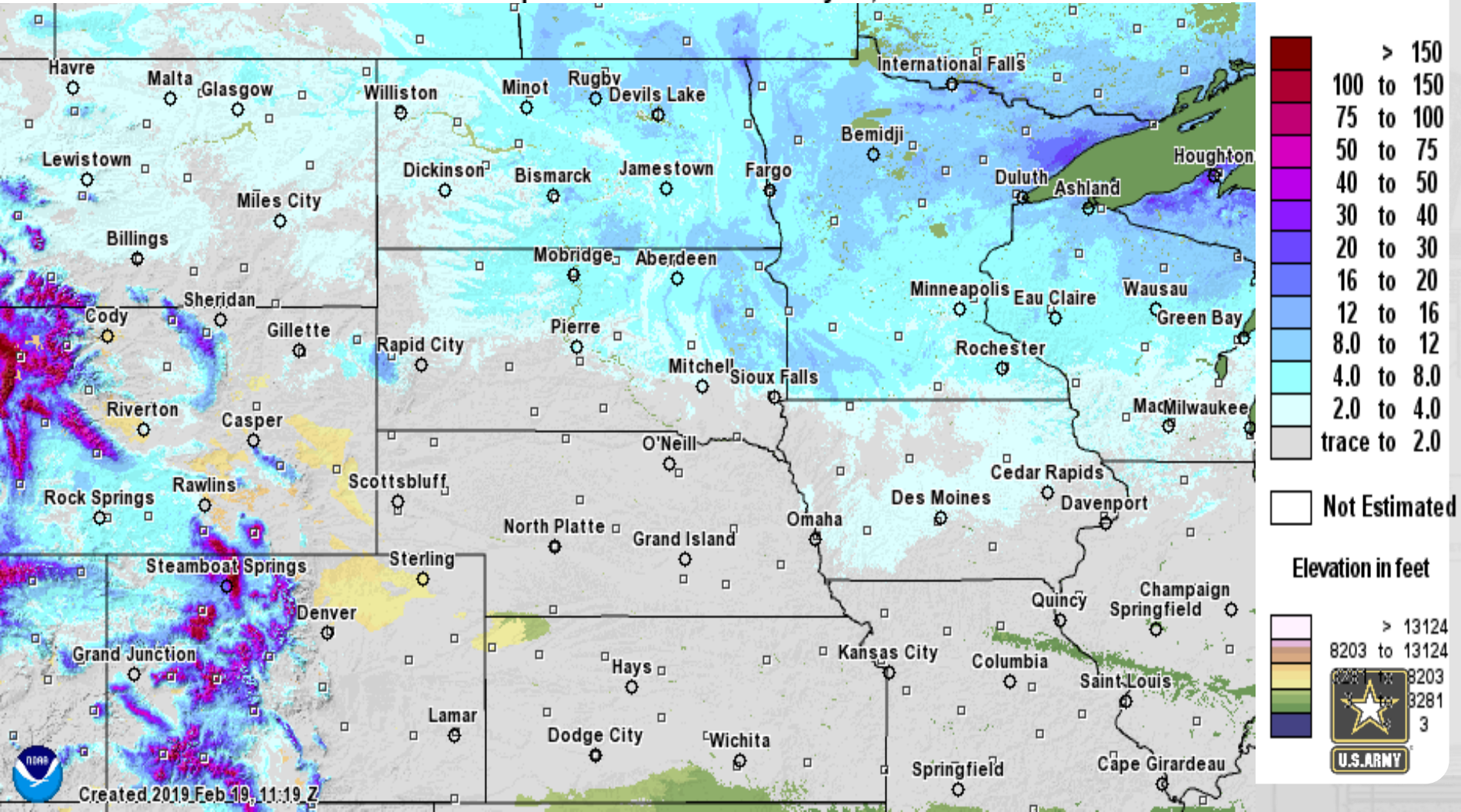
# SNOW DEPTH DEPARTURE

Modeled Snow Depth Departure from Normal (Daily) for 2019 February 19, 6:00 UTC



# SNOW WATER EQUIVALENT

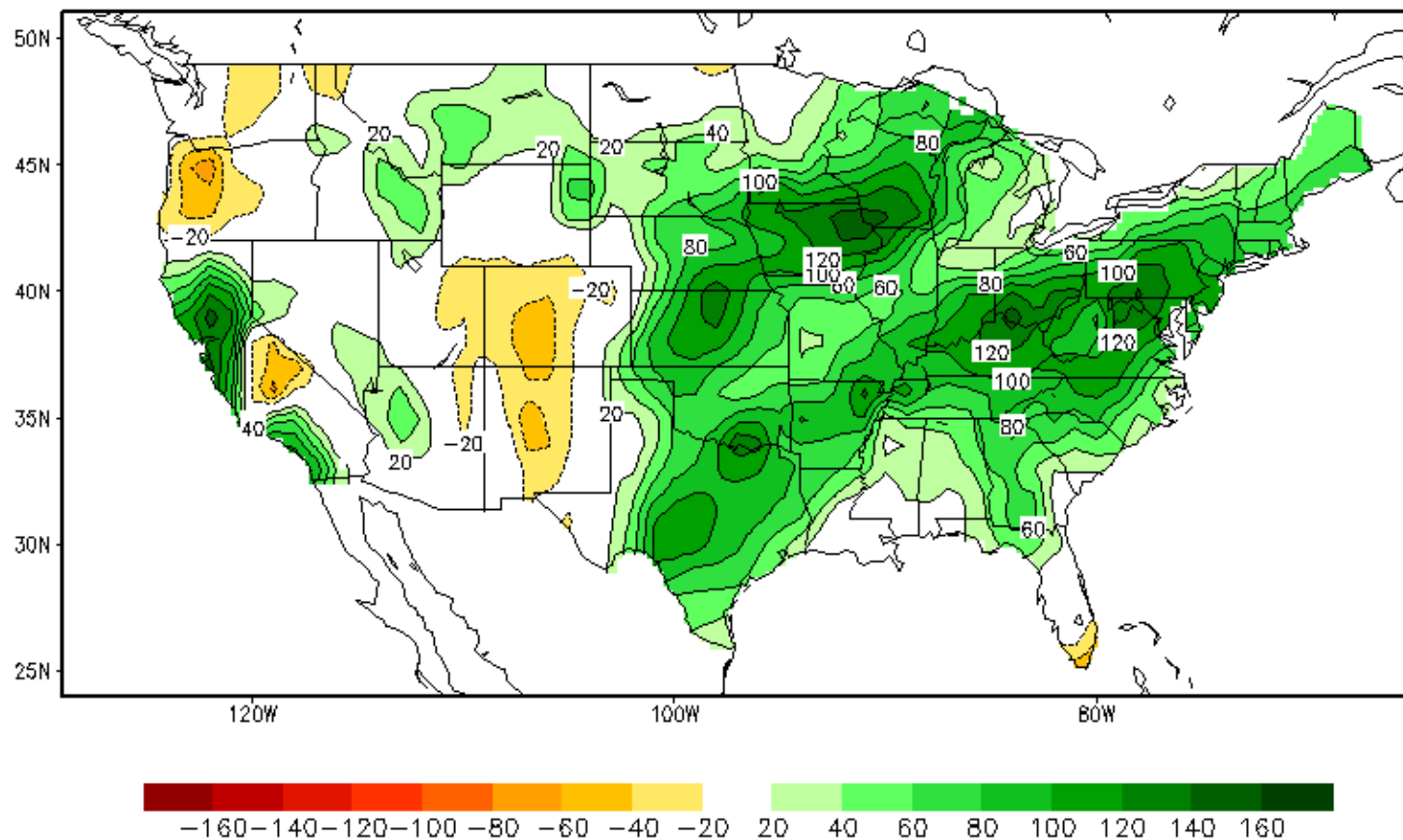
Modeled Snow Water Equivalent for 2019 February 19, 6:00 UTC













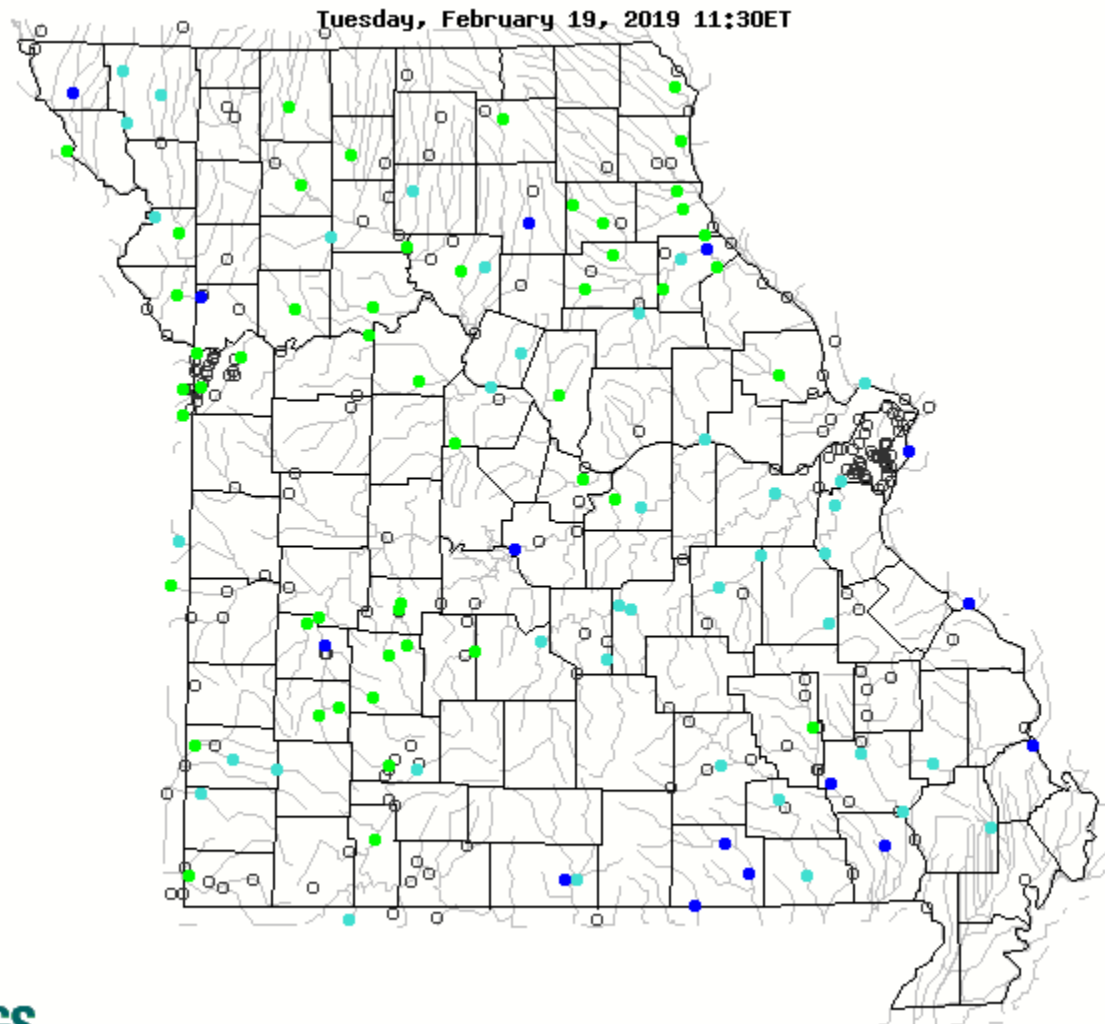
# SOIL MOISTURE

Calculated Soil Moisture Anomaly (mm)  
FEB 18, 2019



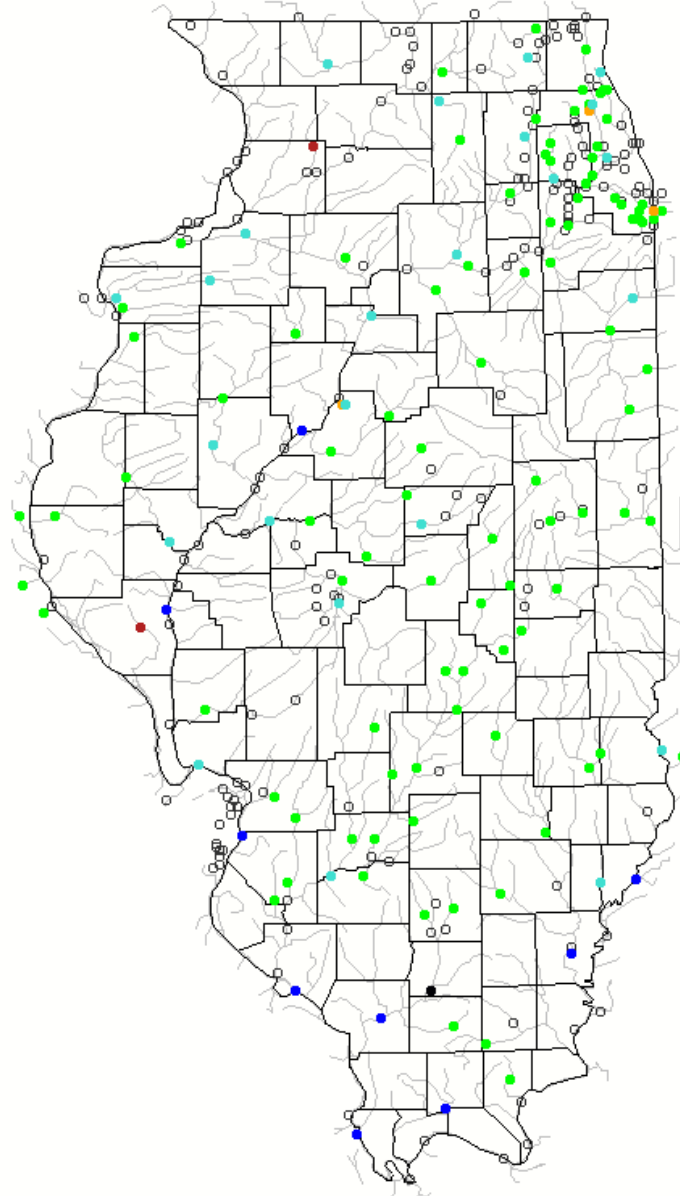
# MISSOURI STREAMFLOW

Explanation - Percentile classes							
							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked



# ILLINOIS STREAMFLOW

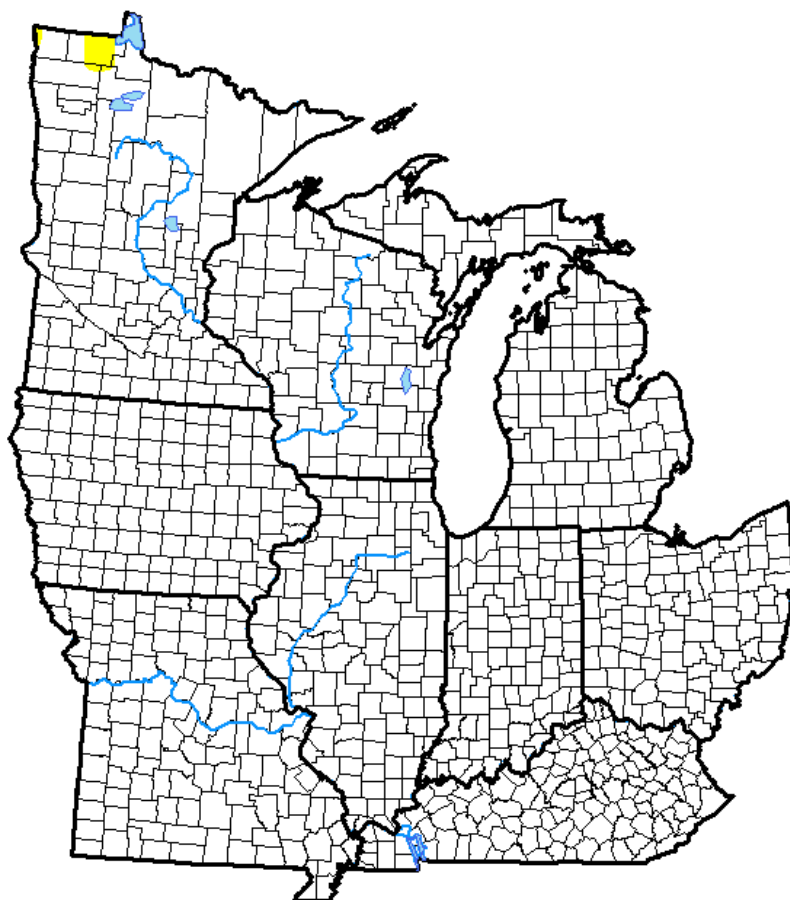
Tuesday, February 19, 2019 11:30ET





# DROUGHT MONITOR

## U.S. Drought Monitor Midwest



**February 12, 2019**

*(Released Thursday, Feb. 14, 2019)*

Valid 7 a.m. EST

*Drought Conditions (Percent Area)*

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	99.72	0.28	0.00	0.00	0.00	0.00
<b>Last Week</b> <i>02-05-2019</i>	99.72	0.28	0.00	0.00	0.00	0.00
<b>3 Months Ago</b> <i>11-13-2018</i>	97.98	2.02	0.00	0.00	0.00	0.00
<b>Start of Calendar Year</b> <i>01-01-2019</i>	99.27	0.73	0.00	0.00	0.00	0.00
<b>Start of Water Year</b> <i>09-25-2018</i>	81.26	18.74	8.55	1.71	0.37	0.01
<b>One Year Ago</b> <i>02-13-2018</i>	66.88	33.12	14.42	4.05	0.78	0.00

### Intensity:

<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> D0 Abnormally Dry	<span style="background-color: red; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> D3 Extreme Drought
<span style="background-color: orange; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> D1 Moderate Drought	<span style="background-color: darkred; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> D4 Exceptional Drought
<span style="background-color: #ffa500; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> D2 Severe Drought	

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

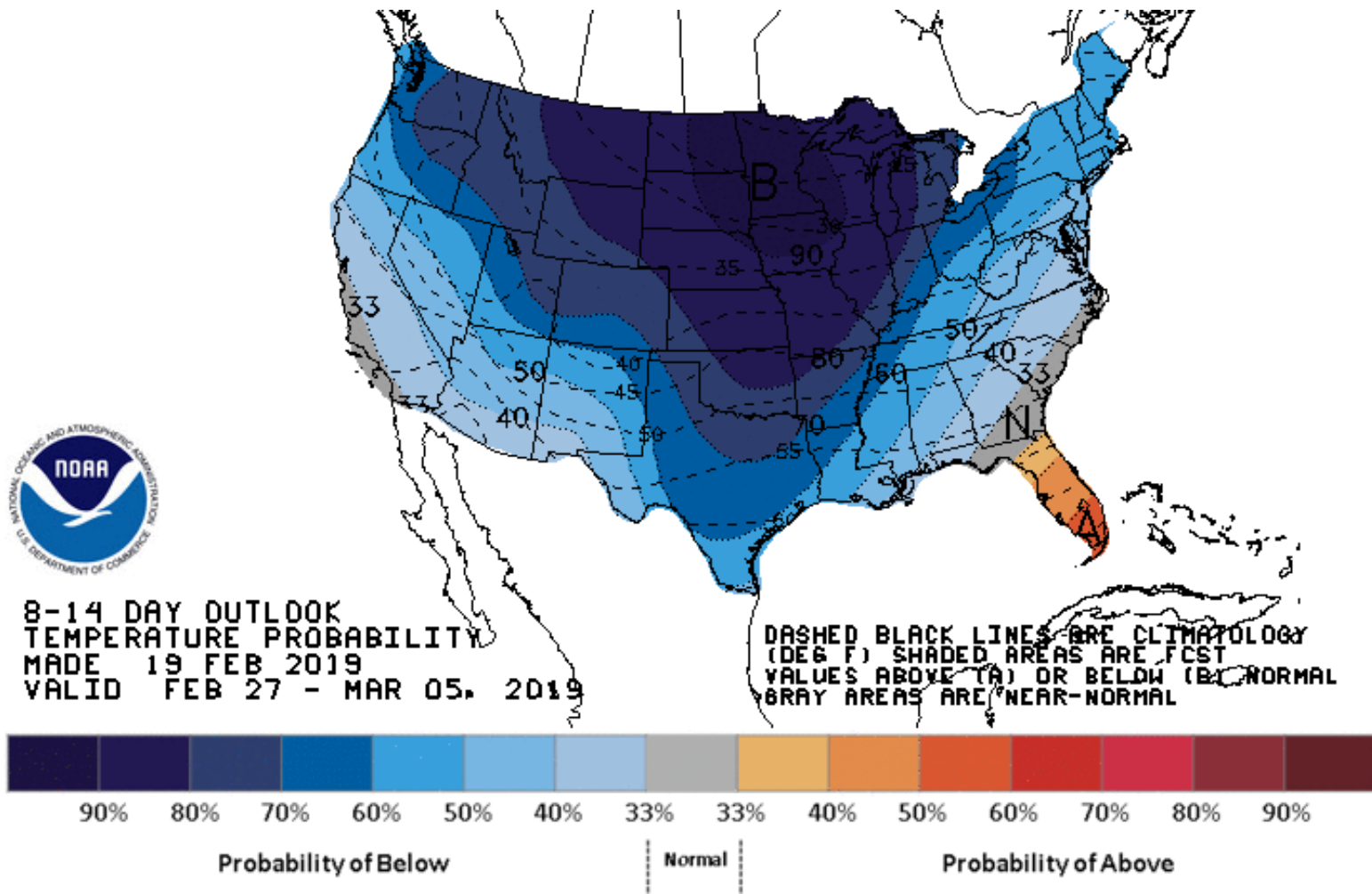
### Author:

Richard Tinker  
CPC/NOAA/NWS/NCEP



<http://droughtmonitor.unl.edu/>

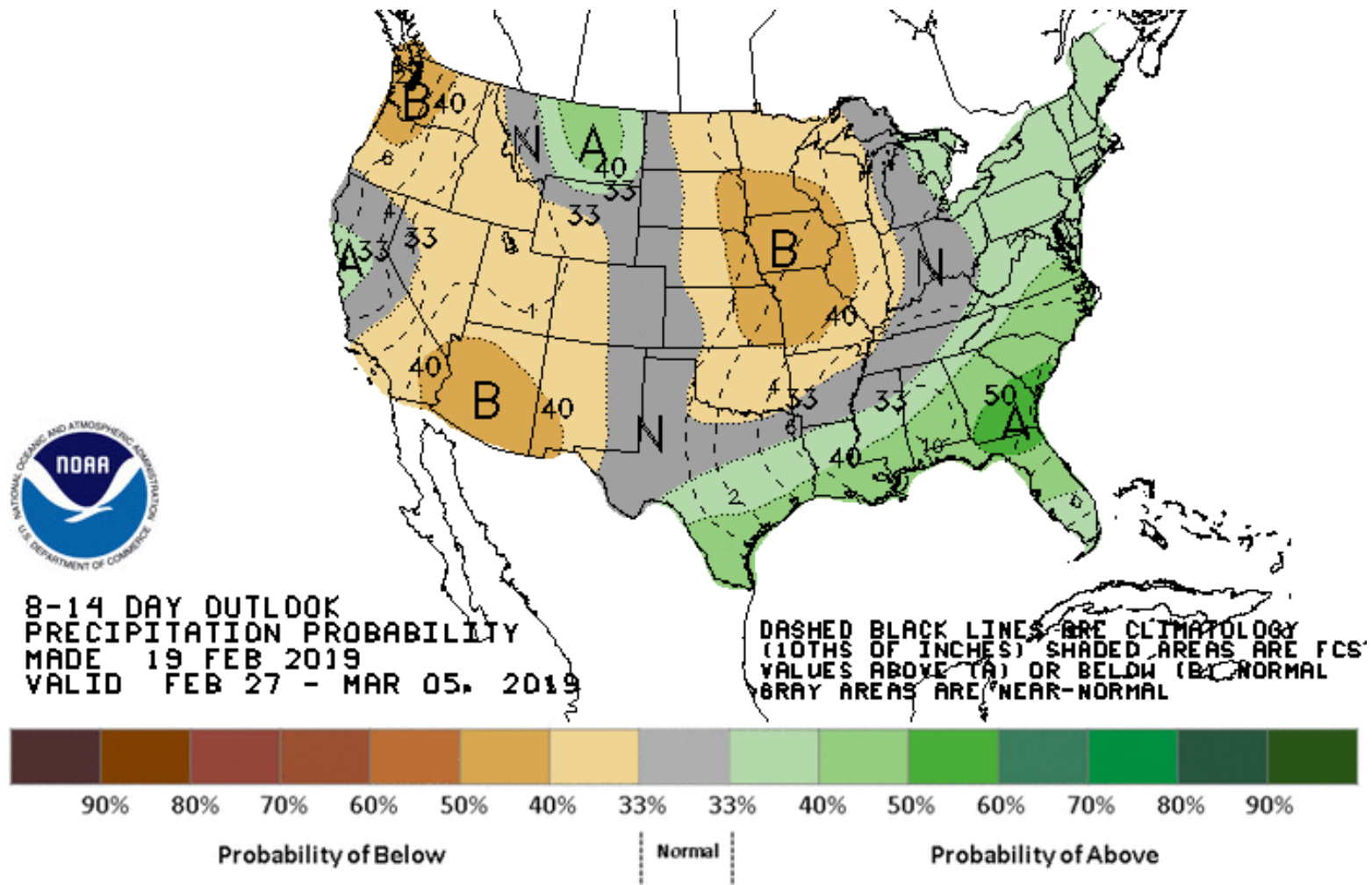
# 8-16 DAY TEMPERATURES



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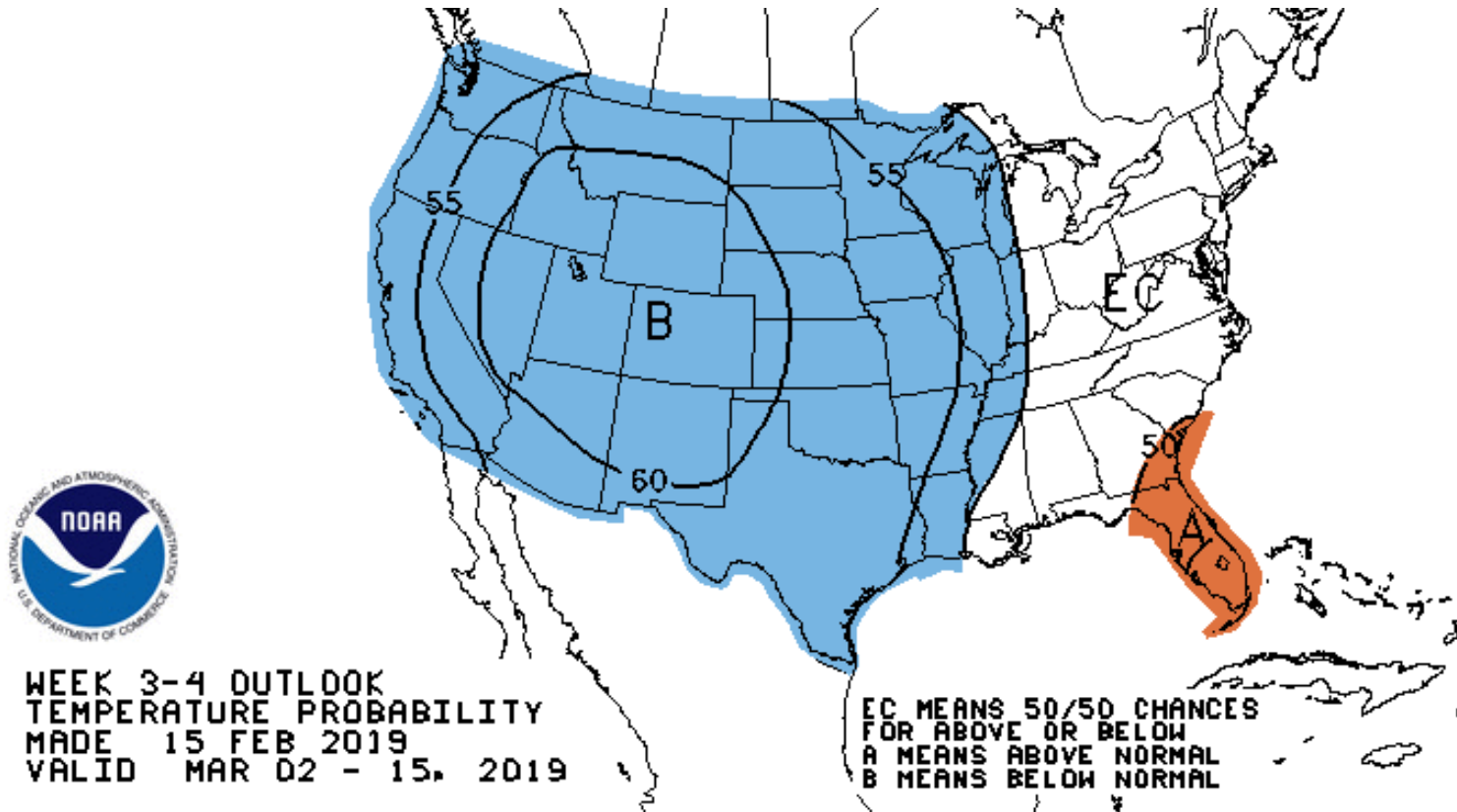
## 8-16 DAY PRECIPITATION



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# EARLY MARCH TEMPERATURES



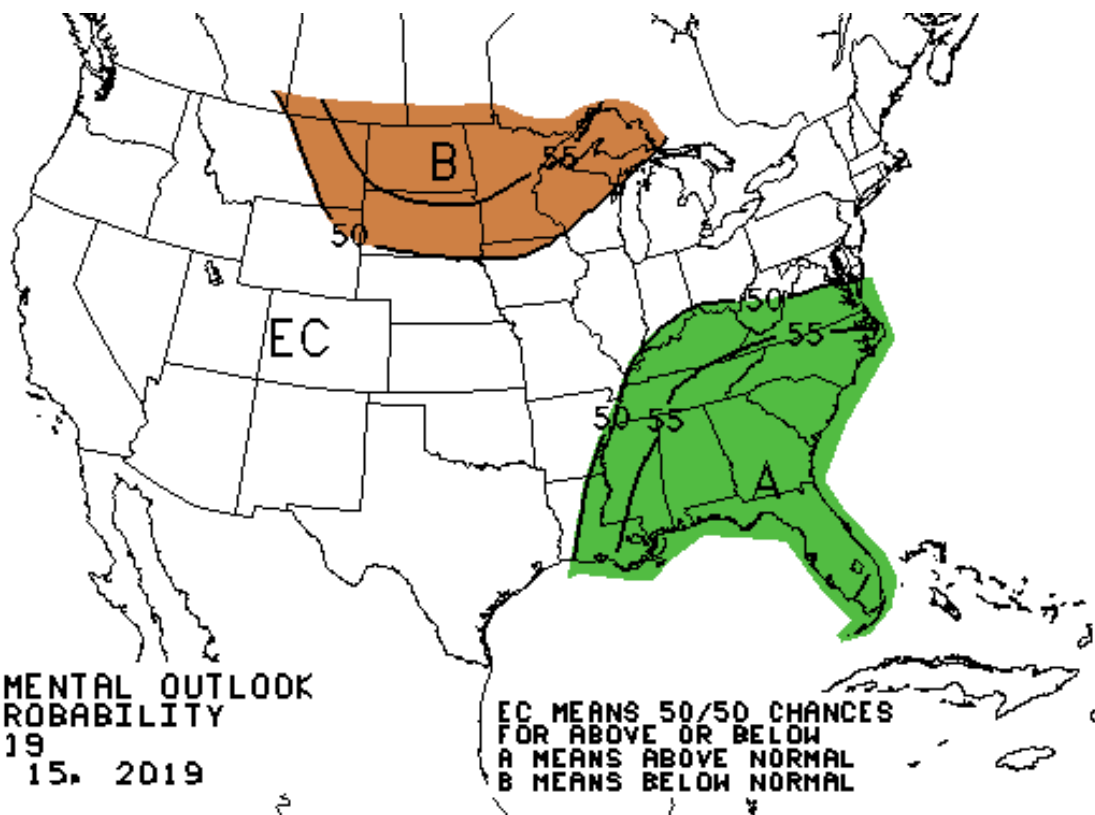
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# EARLY MARCH PRECIPITATION



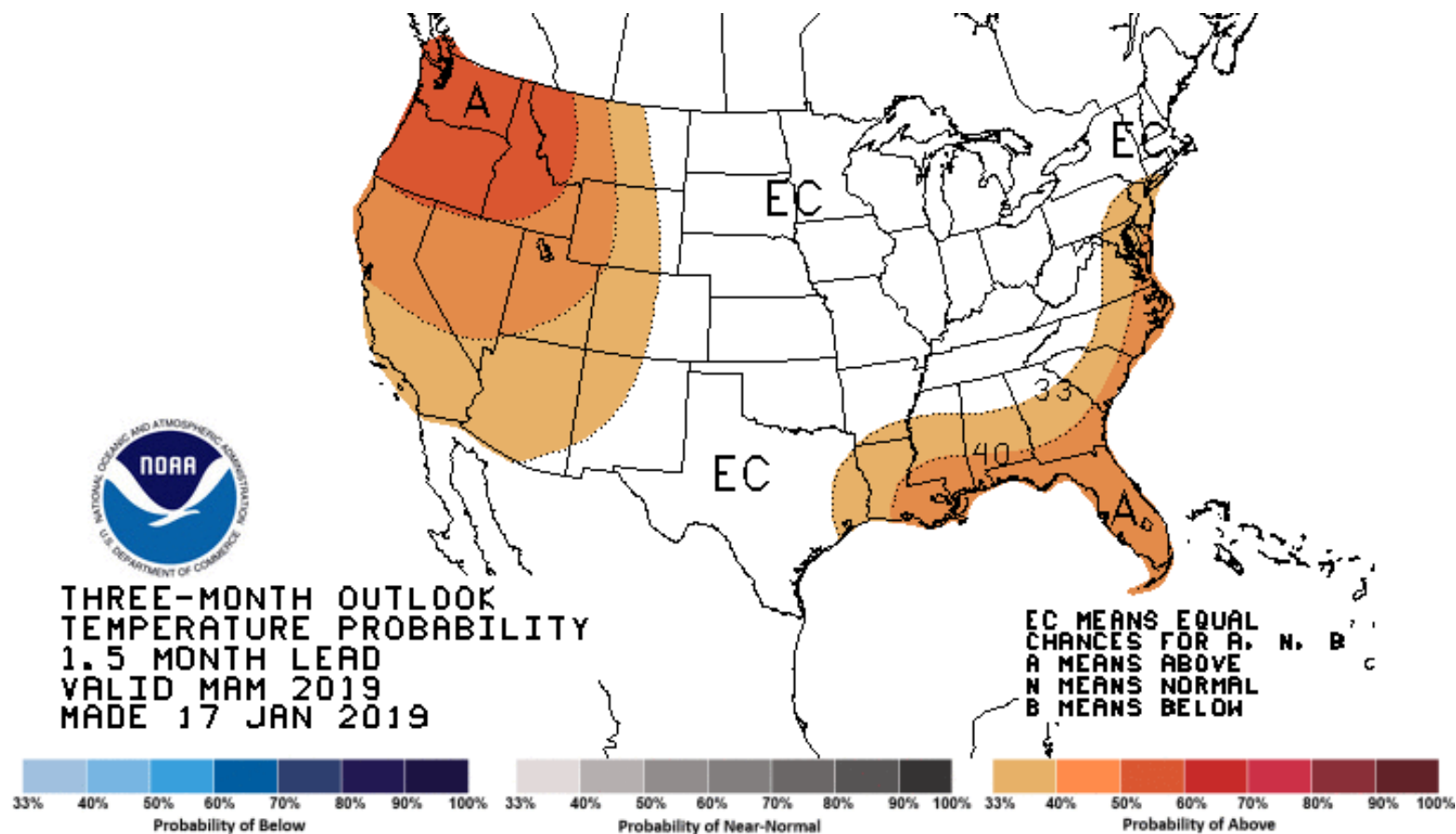
WEEK 3-4 EXPERIMENTAL OUTLOOK  
PRECIPITATION PROBABILITY  
MADE 15 FEB 2019  
VALID MAR 02 - 15, 2019



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# MARCH-MAY TEMPERATURES



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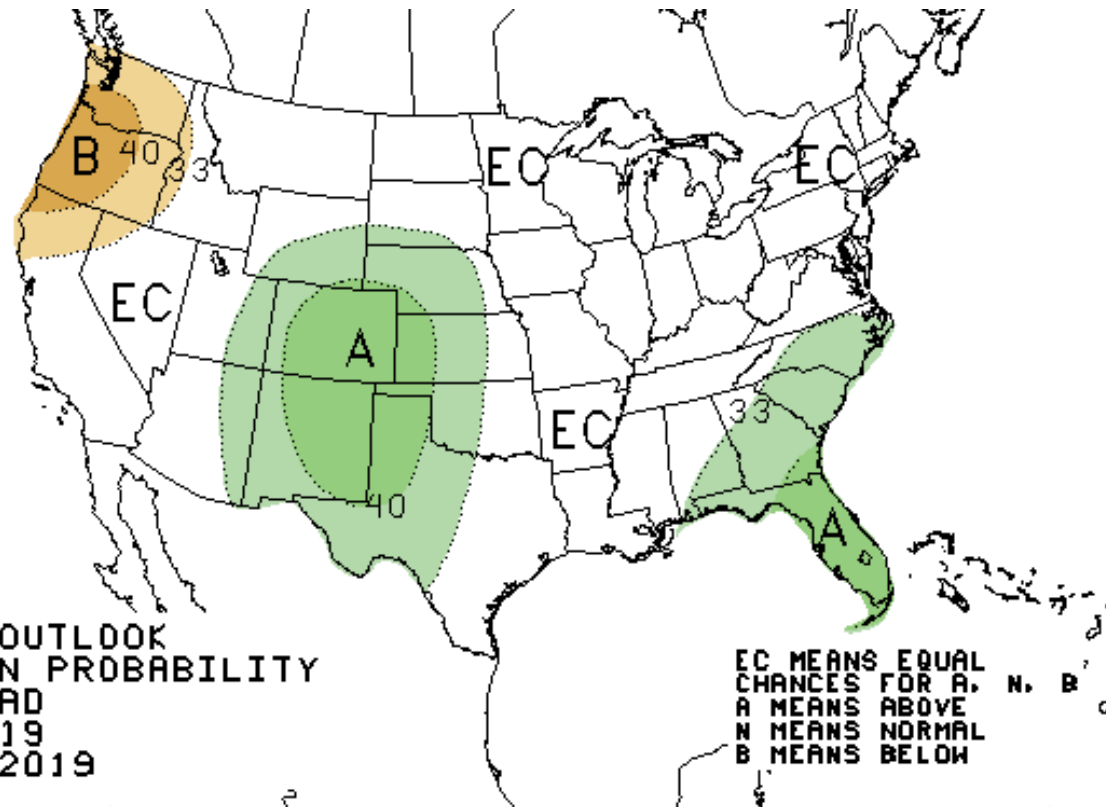




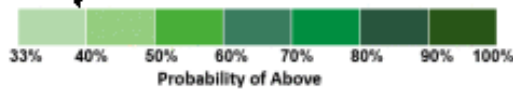
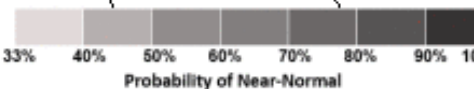
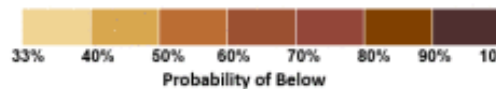
# MARCH-MAY PRECIPITATION



THREE-MONTH OUTLOOK  
PRECIPITATION PROBABILITY  
1.5 MONTH LEAD  
VALID MAM 2019  
MADE 17 JAN 2019



EC MEANS EQUAL  
CHANCES FOR A, N, B  
A MEANS ABOVE  
N MEANS NORMAL  
B MEANS BELOW

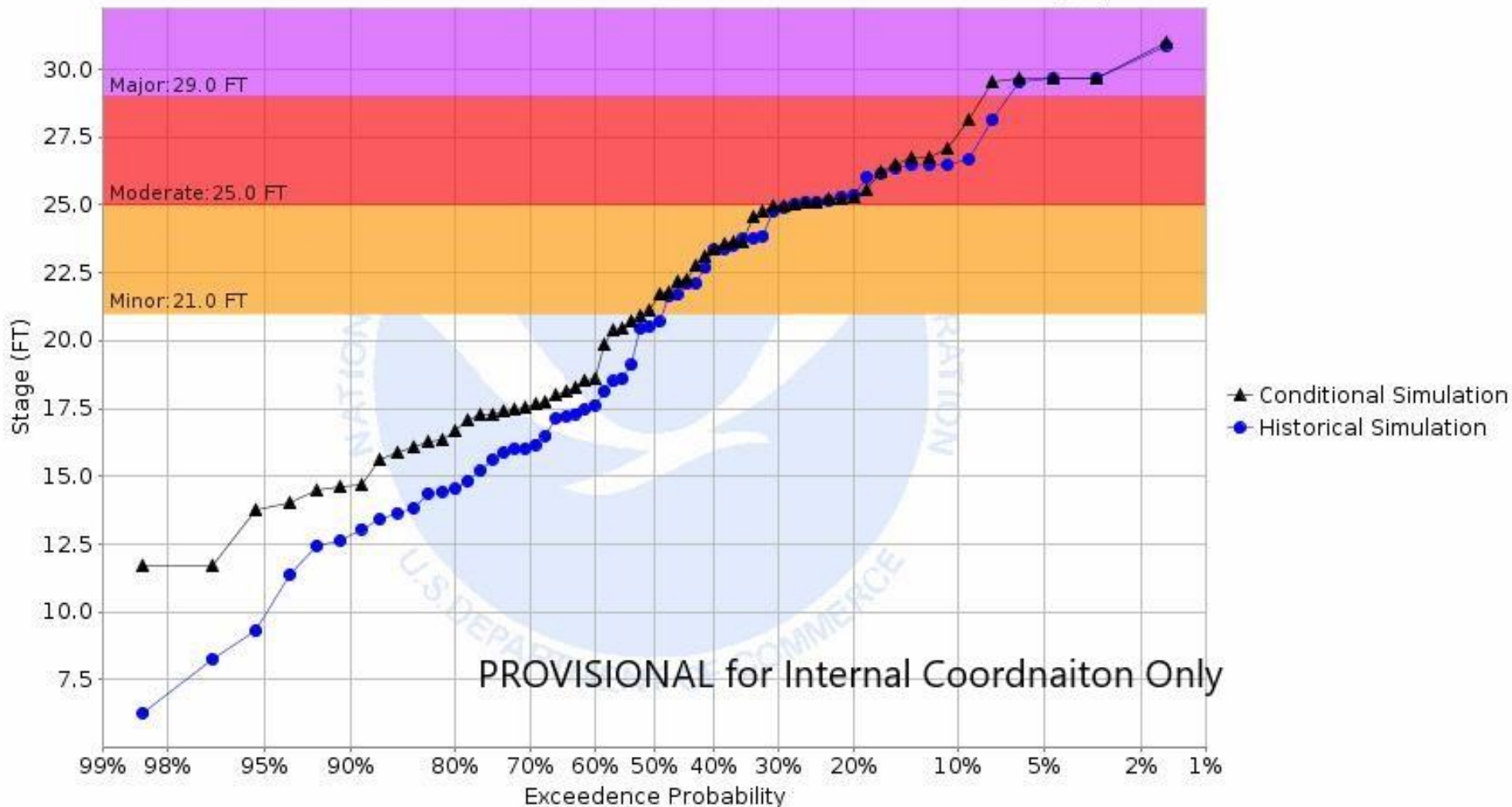


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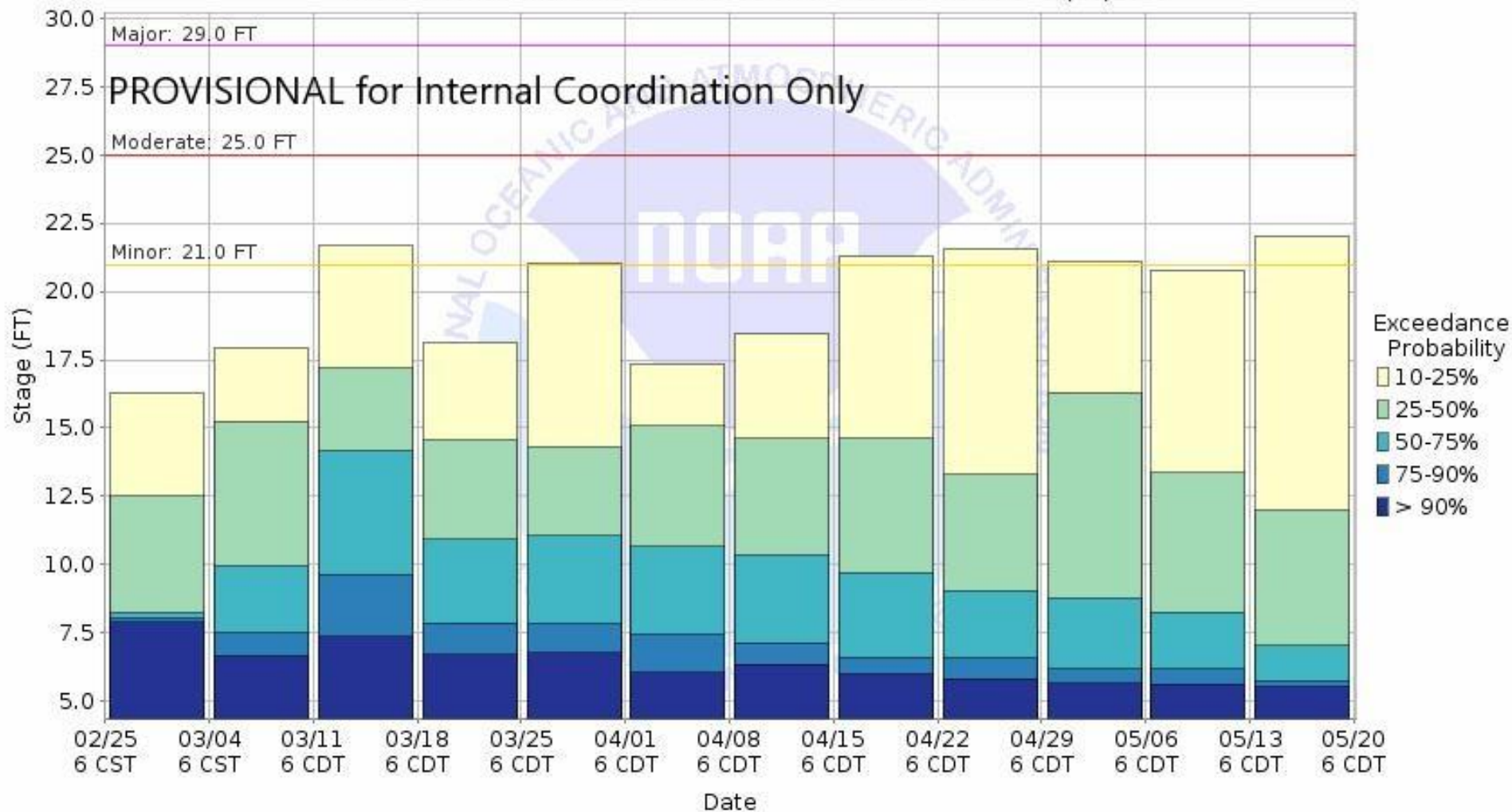
# CUIVRE RIVER AT TROY, MISSOURI

Chance of Exceeding River Stage at Cuivre River at Troy (TRYM7)  
Forecast for the period 02/25/2019 - 05/26/2019  
This is a conditional simulation based on the conditions as of 02/18/2019



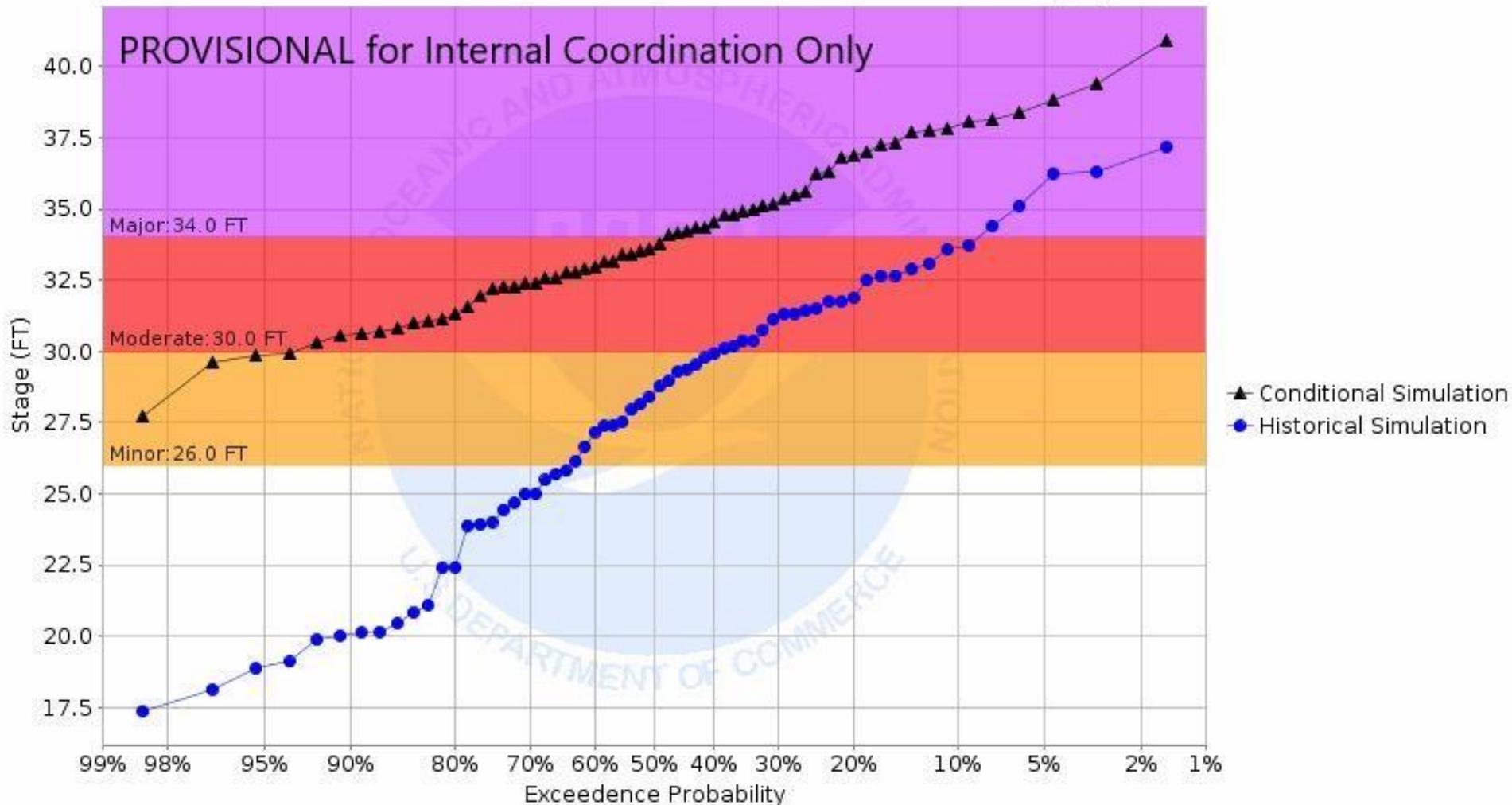
# CUIVRE RIVER AT TROY, MISSOURI

Weekly Chance of Exceeding River Stage at Cuivre River at Troy (TRYM7)  
Forecast for the period 02/25/2019 - 05/26/2019  
This is a conditional simulation based on the conditions as of 02/18/2019



# MISSISSIPPI RIVER AT WINFIELD, MISSOURI (L&D 25)

Chance of Exceeding River Stage at Mississippi River at Cap Au Gris (Winfield) L&D 25 (CAGM7)  
Forecast for the period 02/25/2019 - 05/26/2019  
This is a conditional simulation based on the conditions as of 02/18/2019



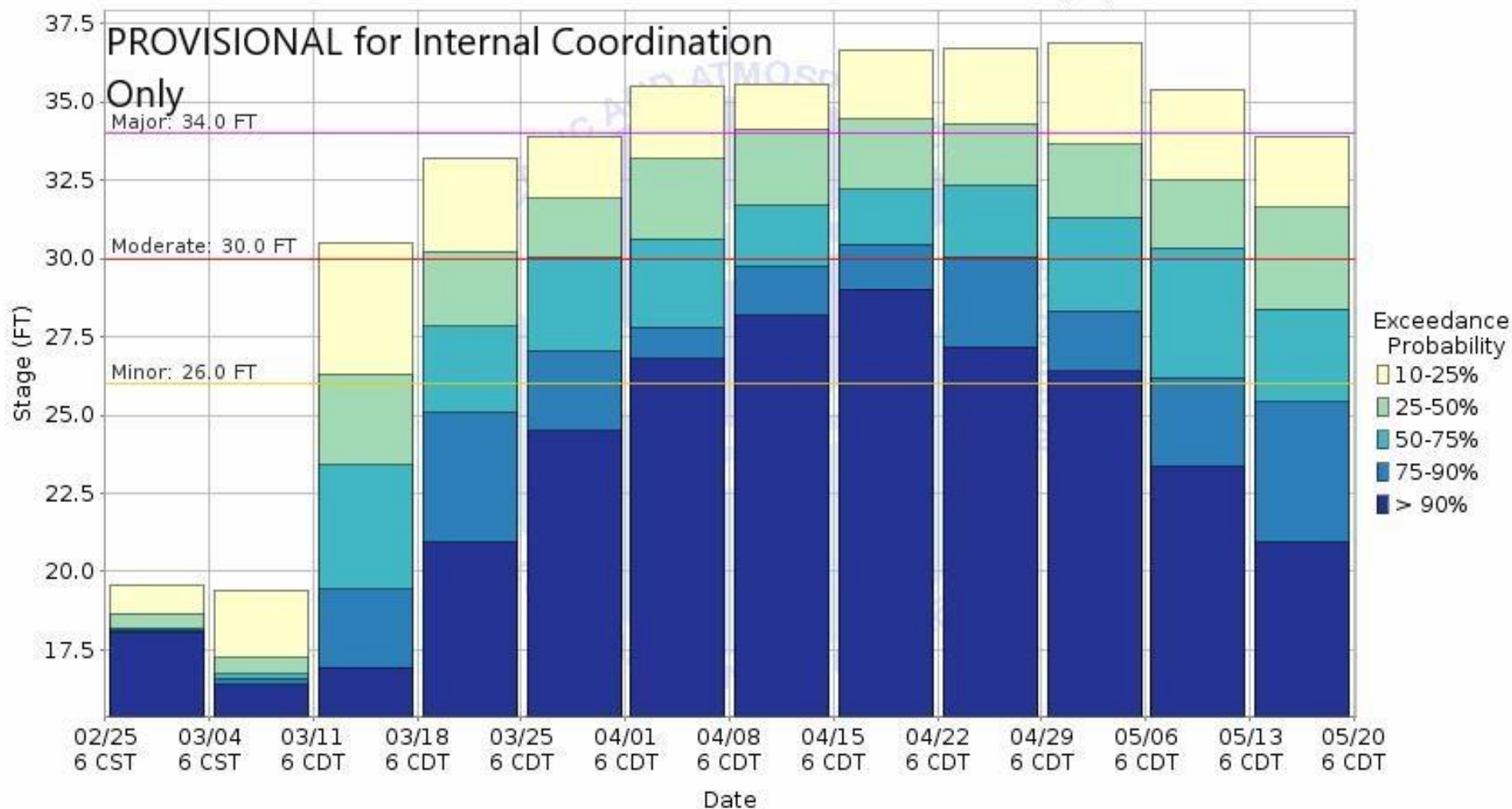


# MISSISSIPPI RIVER AT WINFIELD, MISSOURI (L&D 25)

Weekly Chance of Exceeding River Stage at Mississippi River at Cap Au Gris (Winfield) L&D 25 (CAGM7)

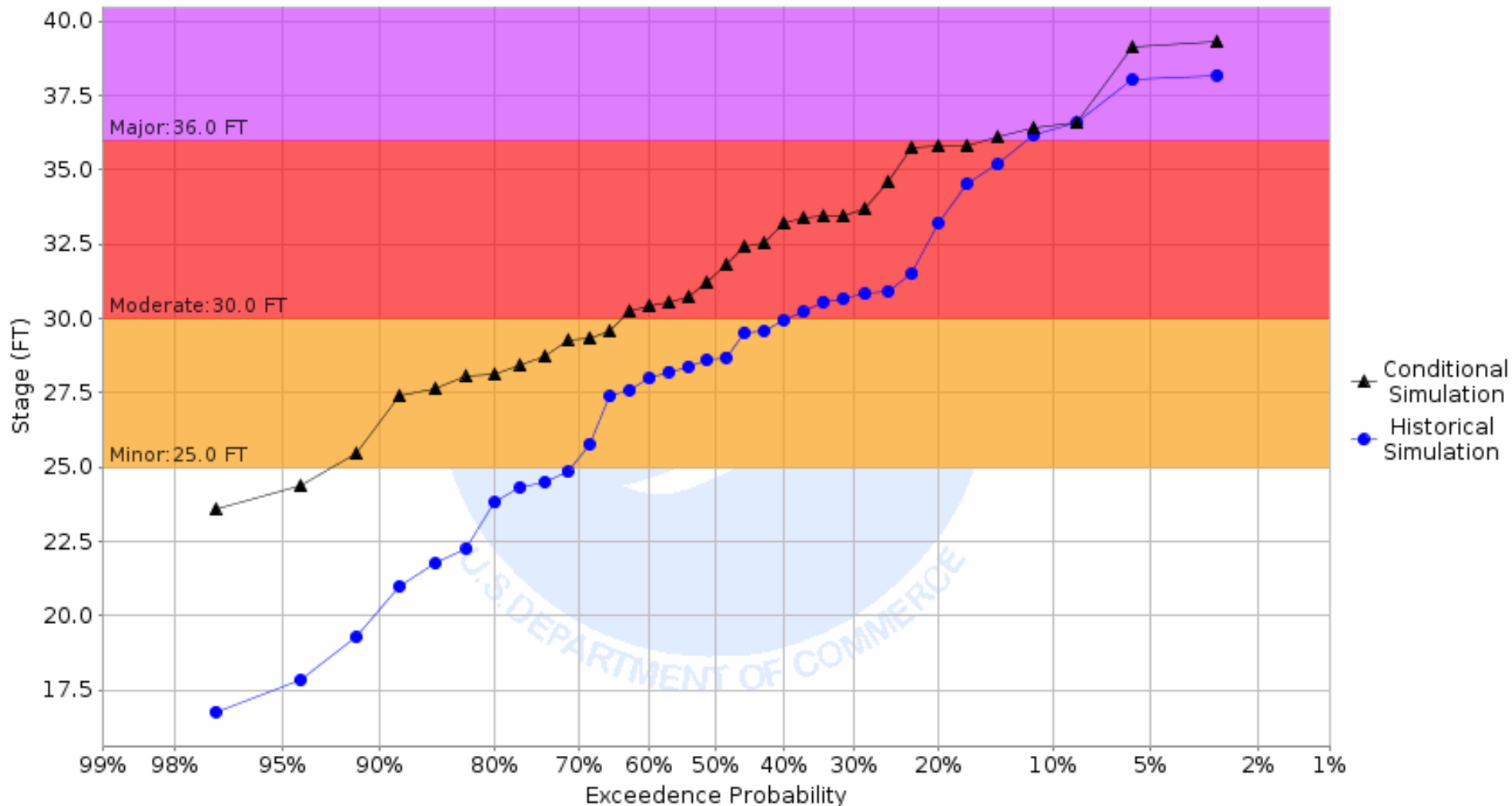
Forecast for the period 02/25/2019 - 05/26/2019

This is a conditional simulation based on the conditions as of 02/18/2019



# MISSOURI RIVER AT ST. CHARLES

Chance of Exceeding River Stage on the MISSOURI R at ST CHARLES MO 1E  
Forecast for the period 02/23/2019 - 05/24/2019  
This is a conditional simulation based on the current conditions as of 02/18/2019



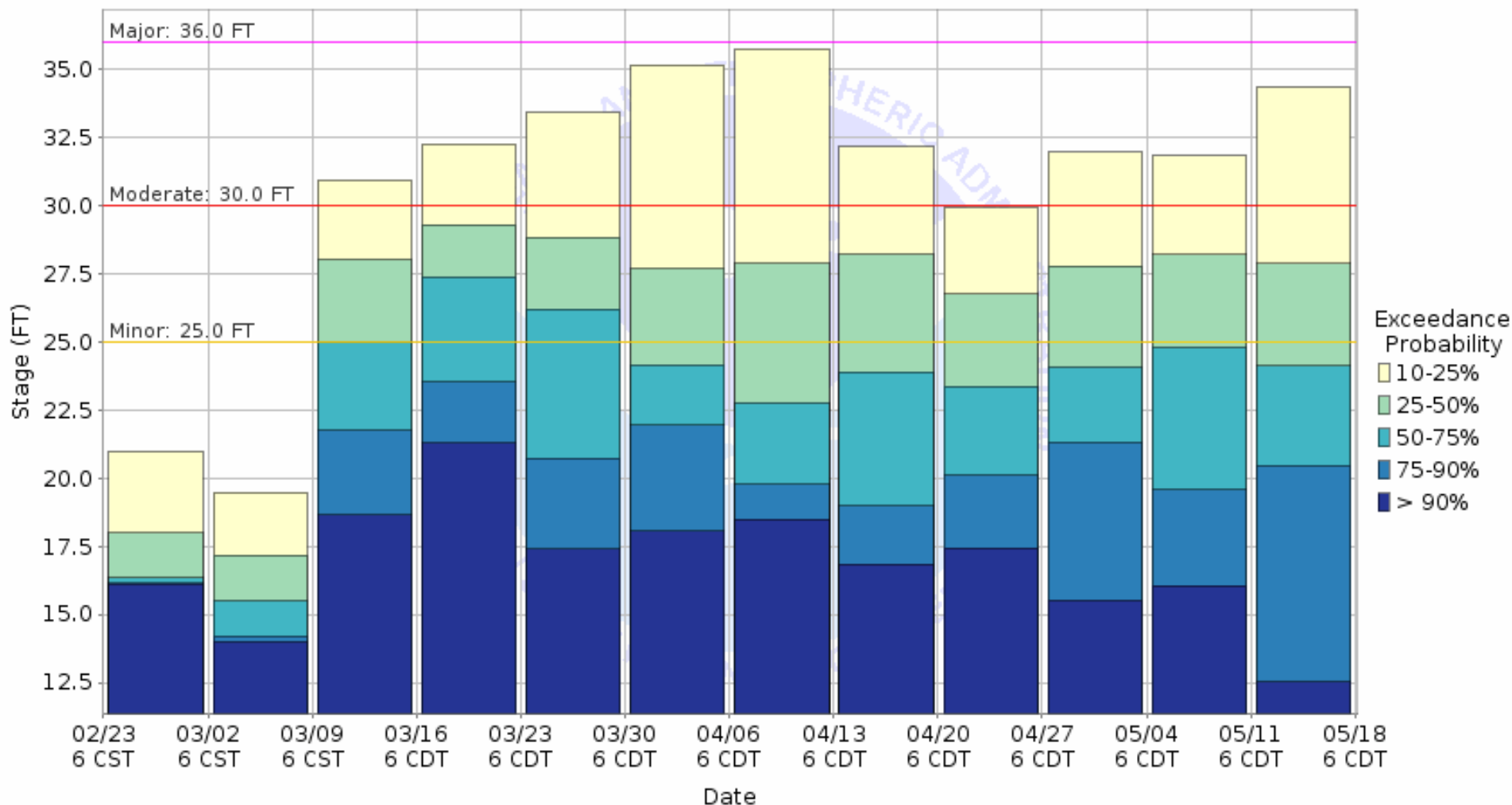


# MISSOURI RIVER AT ST. CHARLES

Weekly Chance of Exceeding River Stage on the MISSOURI R at ST CHARLES MO 1E

Forecast for the period 02/23/2019 - 05/18/2019

This is a conditional simulation based on the current conditions as of 02/18/2019



# CONTINGENCY FORECASTS

How confident should we be in the forecast?

[http://www.weather.gov/crh/rfc\\_ensemble](http://www.weather.gov/crh/rfc_ensemble)



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# CONTINGENCY FORECASTS–24 HR

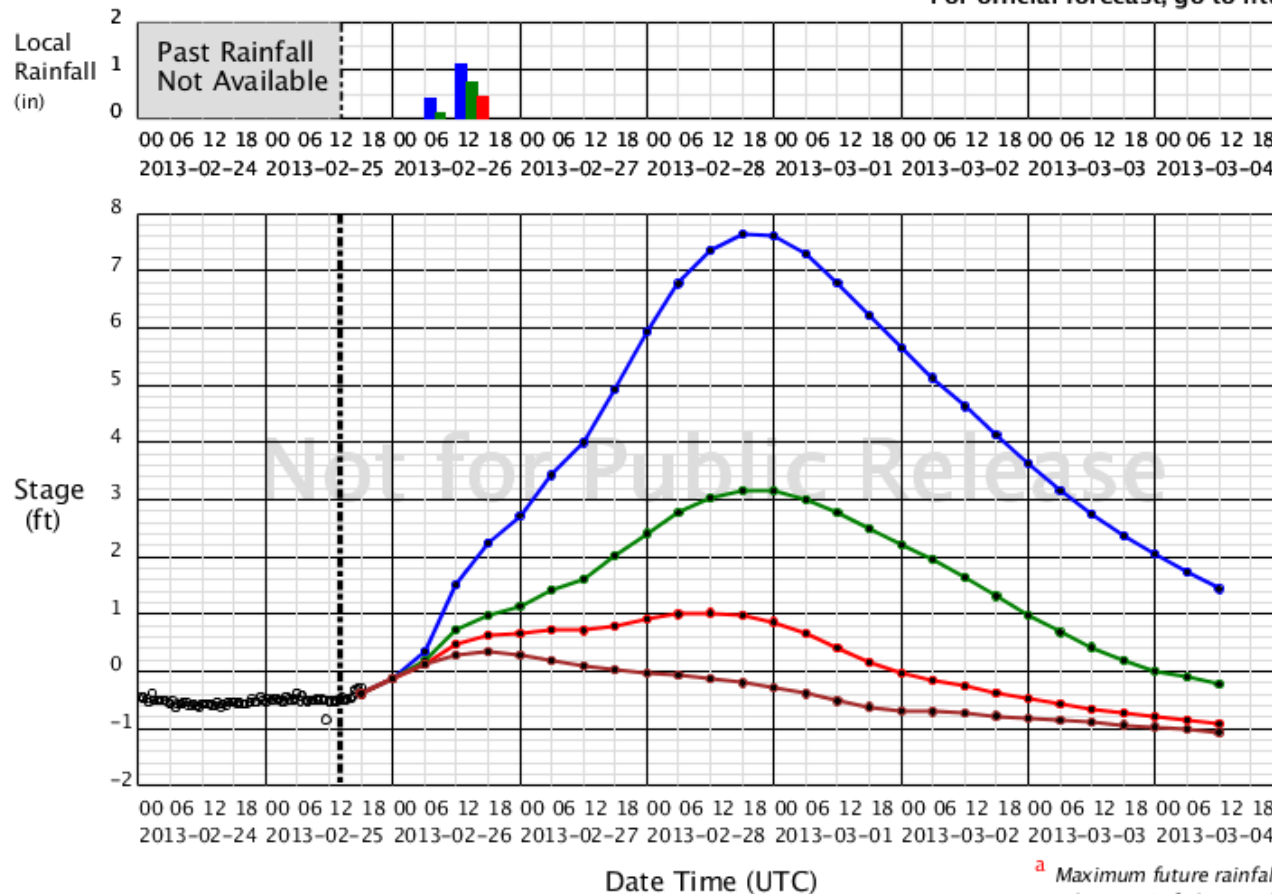
## Preliminary River Model Output – Use with Caution

NCRFC Ensemble Model Output

EADM7 -- Mississippi River -- St Louis (Eads Bridge), MO

This product has not been reviewed by NWS Forecasters

For official forecast, go to <http://water.weather.gov/ahps>



### River Model Output with 24 hrs Future Rainfall

- Maximum<sup>a</sup> Future Rainfall (24 hour)
- Best Estimate<sup>b</sup> Future Rainfall (24 hour)
- Minimum<sup>c</sup> Future Rainfall (24 hour)
- Zero Future Rainfall (24 hour)

Observed Values

Major Stage = 40 ft.

Moderate Stage = 35 ft.

Minor Stage = 30 ft.

Flood Stage = 30 ft.

<sup>a</sup> Maximum future rainfall – 95th percentile, or the amount of precipitation has a 5% of chance of being reached/exceeded.

<sup>b</sup> Best estimate future rainfall – 50th percentile, or the amount of having a 50% chance of being reached/exceeded.



Graph Creation Date: Mon, 25 Feb 2013 18:10:45 +0000 UTC

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# CONTINGENCY FORECASTS-72 HR

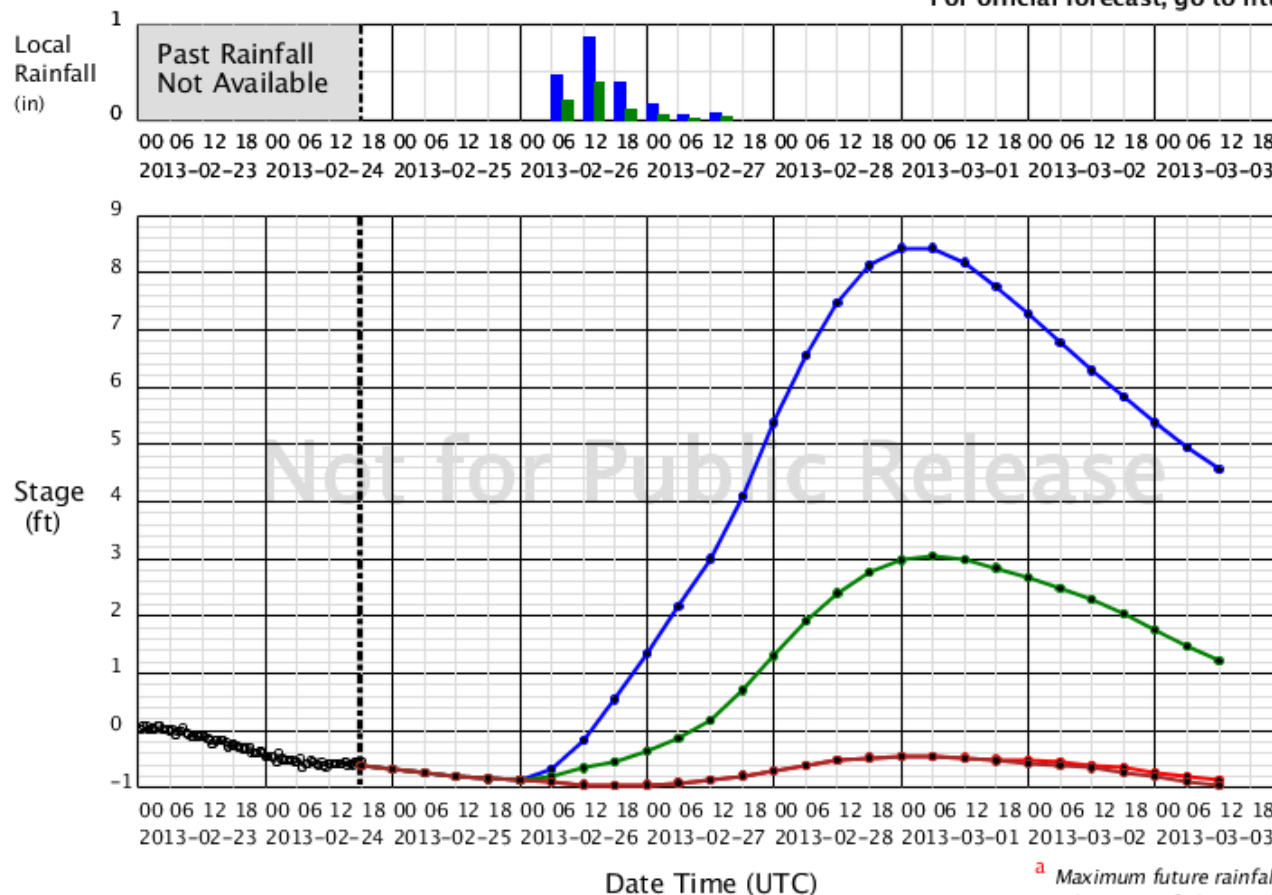
## Preliminary River Model Output – Use with Caution

NCRFC Ensemble Model Output

EADM7 -- Mississippi River -- St Louis (Eads Bridge), MO

This product has not been reviewed by NWS Forecasters

For official forecast, go to <http://water.weather.gov/ahps>



### River Model Output with 72 hrs Future Rainfall

- Maximum<sup>a</sup> Future Rainfall (72 hour)
- Best Estimate<sup>b</sup> Future Rainfall (72 hour)
- Minimum<sup>c</sup> Future Rainfall (72 hour)
- Zero Future Rainfall (72 hour)

Observed Values

Major Stage = 40 ft.

Moderate Stage = 35 ft.

Minor Stage = 30 ft.

Flood Stage = 30 ft.

<sup>a</sup> Maximum future rainfall – 95th percentile, or the amount of precipitation has a 5% of chance of being reached/exceeded.

<sup>b</sup> Best estimate future rainfall – 50th percentile, or the amount of having a 50% chance of being reached/exceeded.

Graph Creation Date: Sun, 24 Feb 2013 18:30:46 +0000 UTC

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# QUESTIONS?

Mark Fuchs  
Service Hydrologist  
WFO St. Louis, Missouri  
mark.fuchs@noaa.gov  
636-447-1876



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# USACE: EMERGENCY MANAGEMENT

**Jennifer Wilson**  
**FCCE Program Manager**  
**St. Louis District**

*“The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation.”*



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# EMERGENCY MANAGEMENT

## How We Assist Levee Sponsors

### USACE Flood Action Stages



**Phase 1: Flood Area**  
**Engineers contact the**  
**affected local levee**  
**sponsors**

**Phase 2: Deploy flood fight**  
**teams to local levee**  
**areas for technical**  
**assistance**

**PL84-99 Post Flood Recovery**  
**Program**



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# USACE ASSISTANCE

## Assistance We Can Provide

- Sandbags
- Crisafulli Pumps
- Plastic
- Sandbagging Machine
- Technical Assistance





# ADDITIONAL ASSISTANCE



**Local**



**County**



**State**



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# THANK YOU



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# LEVEE SAFETY PROGRAM ST. LOUIS DISTRICT

Rachel Lopez, P.E.  
Levee Safety Program Manager

Josh VerDught, P.E.  
Chief, Dam and Levee Safety Section  
January-February 2019



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# DISCUSSION TOPICS

- Upcoming Policy Changes
- Risk Assessments & Communication
- Periodic Inspection Schedule
- Handouts



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# LEVEE POLICY UPDATES

**Published September 2018**

Section 408 / Alterations – EC 1165-2-220

<http://www.usace.army.mil/Missions/Civil-Works/Section408>

**Coming this Spring for External Review:**

Levee Safety Policy and Procedures - EC 1165-2-218

Levee Inspections and Site Visit Procedures – ECB No. 2019-xx

**Final Steps Underway:**

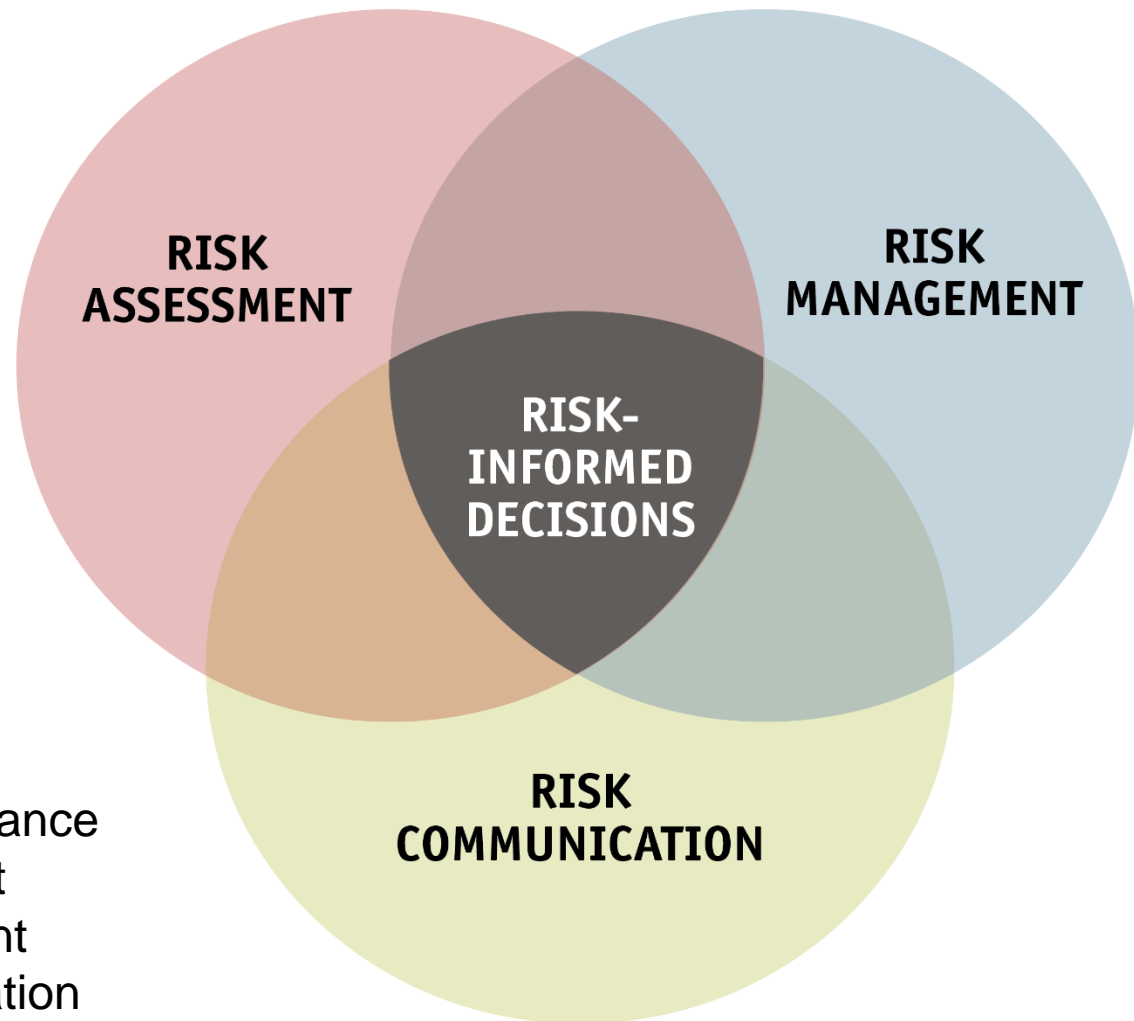
ER 500-1-1 Rehabilitation Program



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# LEVEE SAFETY POLICY – EC 1165-2-218



## Four Parts

1. Program Governance
2. Risk Assessment
3. Risk Management
4. Risk Communication



# PROPOSED CHANGES TO ALIGN WITH RISK MANAGEMENT GOAL

- Less frequent, but more comprehensive activities
  - **More sponsor engagement**
    - Levee Sponsor Handbook
  - **Levee Risk Management Summaries**
    - Focus on risk
    - System-based, segment info highlighted

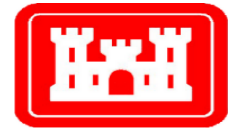




# LEVEE RISK MANAGEMENT SUMMARY

## Levee Risk Management Summary (LRMS)

Date: dd mmm yyyy



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### Purpose:

The intent of the Levee Risk Management Summary (LRMS) is to summarize the best available information related to risk assessments, levee inspections, past performance, and recent risk management activities to aid in the generation of an up-to-date set of risk-informed recommendations for the levee system.

For multi-segment systems, Levee System information is important to consider in risk management and risk communication decisions as well as information associated with the specific Levee Segment. Levee Segment information included herein is focused on the segment for which this LRMS is intended (as noted below).

**Levee System (Name, NLD ID):**

**Levee Segment (Name, NLD ID):**

### Levee Segment Information for This System

	<u>Levee Segment Name</u>	<u>Levee Segment NLD #</u>	<u>LSAC</u>

### Comprehensive Recommended Actions – Prioritized by Risk (Levee System)

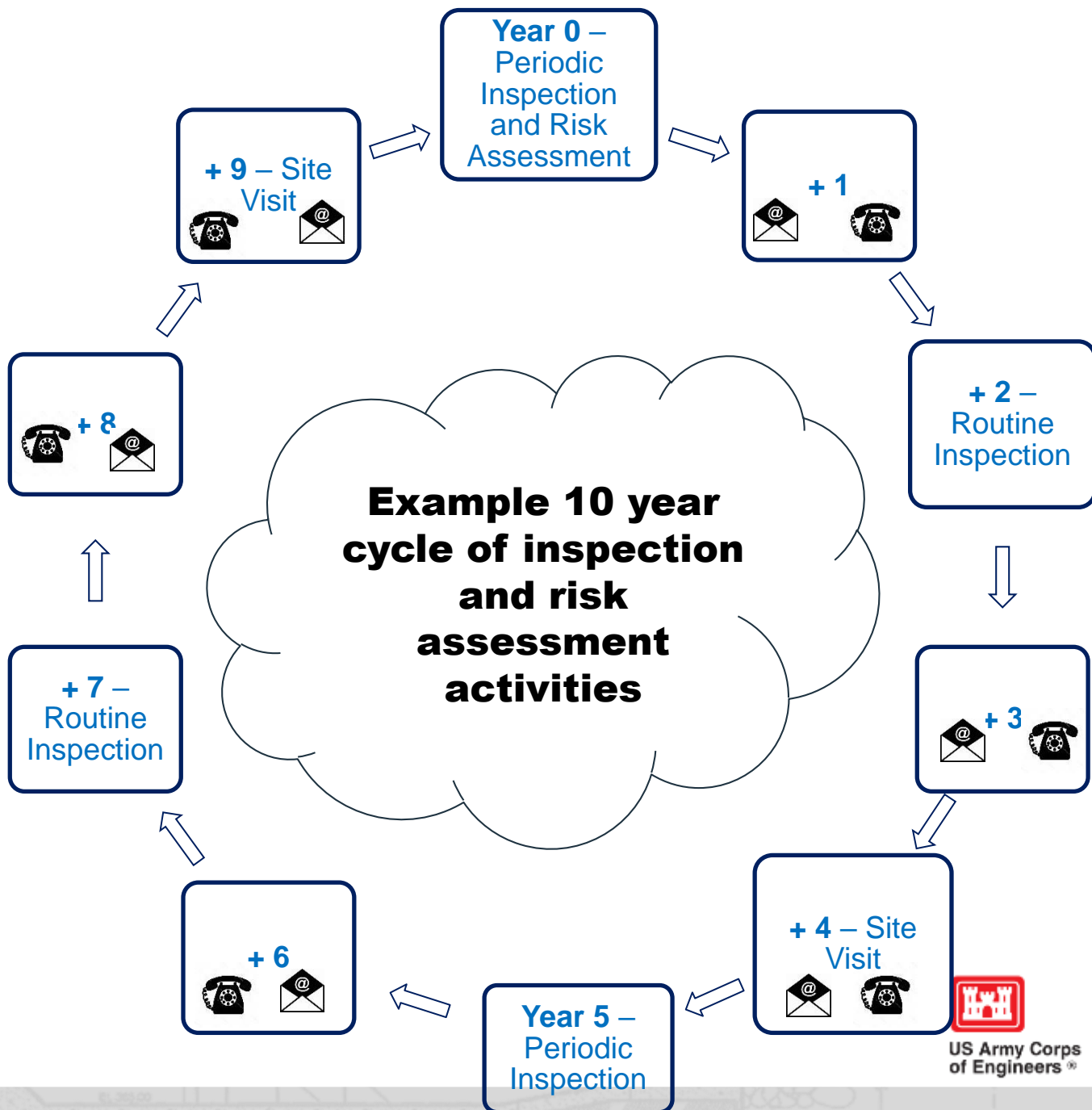
Tracking No.	Priority Rank	Action	Category
			<i>Four Categories based on Tolerable Risk Guidelines</i> <ol style="list-style-type: none"> <li>1. Understand Risk</li> <li>2. Build Awareness</li> <li>3. Day-To-Day Responsibilities</li> <li>4. Manage/Reduce Risk</li> </ol>

Recommend Update to the Risk Assessment: YES NO

# PROPOSED CHANGES TO ALIGN WITH RISK MANAGEMENT GOAL

- Less frequent, but more comprehensive activities
  - More sponsor engagement
    - Levee Sponsor Handbook
  - Levee Risk Management Summaries
    - Focus on risk
    - System-based, segment info highlighted
  - **Comprehensive Deliverable Packages**
    - Levee System Summary, Levee Risk Management Summary, Inspection Checklist, Risk Assessment Fact Sheet
  - **Revised inspection frequency**
    - Inspections 2-3 years: Periodic Inspections - 5 years, Periodic Assessments - 10 years, one routine inspection between each
    - Site visits as needed





# PROPOSED CHANGES TO ALIGN WITH RISK MANAGEMENT GOAL

- Less frequent, but more comprehensive activities
  - More sponsor engagement
    - Levee Sponsor Handbook
  - Levee Risk Management Summaries
    - Focus on risk
    - System-based, segment info highlighted
  - Comprehensive Deliverable Packages
    - Levee System Summary, Levee Risk Management Summary, Inspection Checklist, Risk Assessment Fact Sheet
  - Revised inspection frequency
    - Inspections 2-3 years: Periodic Inspections - 5 years, Periodic Assessments - 10 years, one routine inspection between each
    - Site visits as needed
- Revised inspection procedures and guidelines



# INSPECTION PROCESS UPDATES

- ❑ New Ratings (Good, Fair, Poor)
- ❑ Revamped Observation Rating Guidelines
  - Added accessibility/emergency planning
  - Record seepage observations, no rating
- ❑ Incorporated use of judgment in ratings
  - Consider all observations together
  - Justification for each Item Rating to document how judgment was used
- ❑ Clarity on Links to 44 CFR 65.10 (NFIP Accreditation)
- ❑ Pipes, Relief Wells, Toe Drains, and Closures Data Tables
  - Condition, inspection schedule, etc.
- ❑ Option for No Verdict System Rating







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# 1. Levee Inspection Summary

1-1 Name of System: \_\_\_\_\_

1-2 Name of Segment: \_\_\_\_\_ ☐ Non-Project Segment

1-3 Public Sponsor, Phone, E-mail: \_\_\_\_\_

1-4 Sponsor Representative, Phone, E-mail: \_\_\_\_\_

1-5 Sponsor Organization: \_\_\_\_\_

1-6 Inspection Report Prepared by: \_\_\_\_\_

1-7 Date(s) of Inspection: \_\_\_\_\_

1-8 Type of Inspection: ☐ Routine Inspection ☐ Periodic Inspection ☐ Special Inspection

Purpose of Special Inspection: \_\_\_\_\_

**1-9 Contents of Inspection Checklist:**

- ☐ 01. Levee Inspection Summary  
☐ 02. Pre-Inspection Form  
☐ 03. General Items  
☐ 04. Embankment

**1-10 Ratings:**

**Overall Segment Rating:** ☐ Good ☐ Fair ☐ Poor  
**Overall System Rating:** ☐ Good ☐ Fair ☐ Poor ☐ No Verdict

LSPM Signature: \_\_\_\_\_ Date Approved: \_\_\_\_\_

## NFIP ACCREDITATION CRITERIA EVALUATION

				44 CFR 65.10 Criteria	44 CFR 65.10 Paragraph
<input type="checkbox"/>	MET	<input type="checkbox"/>	NOT MET	All closure devices, whether manual or automatic, are operated in accordance with an officially adopted operation manual	65.10(c)
<input type="checkbox"/>	MET	<input type="checkbox"/>	NOT MET	Manuals document a flood warning system that will be used to trigger emergency operation activities and demonstration that sufficient flood warning time exists for the completed operation of all closure structures.	65.10(c)(1)i
<input type="checkbox"/>	MET	<input type="checkbox"/>	NOT MET	Manuals identify specific actions and assignments of responsibility by individual name or title.	65.10(c)(1)ii
<input type="checkbox"/>	MET	<input type="checkbox"/>	NOT MET	Manuals identify provisions for periodic operation of closure structures for testing and training purposes, in accordance with the adopted operation manual	65.10(c)(1)iii
<input type="checkbox"/>	MET	<input type="checkbox"/>	NOT MET	Officially adopted maintenance plans documents the formal procedure that ensures that the stability, height, & overall integrity of the levee and its associated structures and systems are maintained	65.10(d)
<input type="checkbox"/>	MET	<input type="checkbox"/>	NOT MET	Maintenance plans specify the maintenance activities to be performed, the frequency of their performance, and the person by name or title responsible for their performance	65.10(d)


## Levee Embankments Feature

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Item No.	Item	Item Rating	Number of Observations			Item Rating Justification
			G	F	P	
4-4	Vegetation	Poor	1	1	1	Non-compliant vegetation observed within localized areas of the VFZ that inhibits flood fight activities and is expected to negatively impact levee integrity.

Observation Rating Guidelines						
Good	<ul style="list-style-type: none"> <li>The levee is free of non-compliant vegetation (brush, weeds, leafy spurge, or trees) or has negligible non-compliant vegetation* within the VFZ, OR</li> <li>Vegetation is maintained within the parameters and boundaries of an approved variance.</li> </ul>					
Fair	<ul style="list-style-type: none"> <li>Non-compliant vegetation within the VFZ is less than 2 inches in diameter, AND</li> <li>There is no approved variance for the observed vegetation.</li> </ul>					
Poor	<ul style="list-style-type: none"> <li>Vegetation is not maintained within the parameters and boundaries of an approved variance, OR</li> <li>There is no approved variance for the observed vegetation, AND</li> <li>Non-compliant vegetation within the VFZ* is 2 inches or greater in diameter or dense brush of any diameter.</li> </ul>					

\*Non-compliant vegetation and the vegetation-free zone (VFZ) are detailed in ETL-1110-2-583 (or more current version).

Observation Data Table - Vegetation				
Observation Number	3		Description of Observation:  Former location of unwanted vegetation within 15' VFZ. Trees have been removed by levee sponsor. Resolved.	
Observation Rating	Good			
Observation Location	Floodside Slope and Crown			
Unresolved Issue Y/N:	Y			
Years Since 1 <sup>st</sup> Observed:	5			
Levee Station or River Mile			Recommendations:  None	Photo Number: 3
Point:	Line			
	Start	End		
	98+00	111+00		
GPS Latitude / Longitude				
Start	End			
-90.5769, 38.69096	-90.57681, 38.68722			



# DATA TABLES

## Pipes Table

This table provides a direct link to observations recorded under Pipe condition Items 6.1 & 6.2: Data entered into this table can be imported into checklist observations and vice versa. Users have the option to print this table format (or portions of the table for a summary, exc. Exclude description of observation...) and/or user could print the checklist format

Item No. 6.1 & 6.2: Condition of Pipes

Pipe ID	Pipe Type	Pipe Size	Year Constructed	Year Rehabilitated	Station or River Mile Start	Station or River Mile End	GPS Latitude Start	GPS Longitude Start	GPS Latitude End	GPS Longitude End	Notes	Observation No.	Year Last Inspected	Scheduled Inspection (Year)	Observation Rating	ID: 6.1 Primary Item 6.2 Away from Levee	Description of Observation
	CMP	48"	1962	NA	10+24	10+24	30.52345	81.45678	30.53485	81.41584	Bituminous Coating		2010	2015	Unknown	6.1 Primary Item	
	CMP	36"	1962	2012	22+36	22+39	30.52352	81.45691	30.55895	81.44891			2012	2022	Good	6.1 Primary Item	
	CMP	18"	1962	NA	16+56	16+56	30.52754	81.46675	30.52467	81.41489			2010	2020	Fair	6.2 Away from Levee	
	RCP	24"	1962	NA	18+72	18+75	30.52352	81.45681	30.5257	81.41238			2010	2020	Fair	6.1 Primary Item	

## Gates Table

This table provides a direct link to observations recorded under Gates Items 6.3 & 6.4: Data entered into this table can be imported into checklist observations and vice versa. Users have the option to print this table format (or portions of the table for a summary, exc. Exclude description of observation...) and/or user could print the checklist format

Item No. 6.3 & 6.4: Gates

Gate Type	Levee Station or River Mile	GPS Latitude	GPS Longitude	Notes	Observation No.	Date Last Operated	Date of Scheduled Operation	Observation Rating	Description of Observation
Sluice	10+24	30.52915	81.43631			Feb-15	Feb-16	Fair	
Flap	10+24	30.53485	81.41584			NA	NA	Poor	
Flap	22+39	30.55895	81.44891			NA	NA	Good	
NA	NA	NA	NA			NA	NA	NA	
Sluice	18+74	30.52461	81.434595			Feb-16	Feb-17	Good	



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# PROPOSED CHANGES TO ALIGN WITH RISK MANAGEMENT GOAL

- Less frequent, but more comprehensive activities
  - More sponsor engagement
    - Levee Sponsor Handbook
  - Levee Risk Management Summaries
    - Focus on risk
    - System-based, segment info highlighted
  - Comprehensive Deliverable Packages
    - Levee System Summary, Levee Risk Management Summary, Inspection Checklist, Risk Assessment Fact Sheet
  - Revised inspection frequency
    - Inspections 2-3 years: Periodic Inspections - 5 years, Periodic Assessments - 10 years, one routine inspection between each
    - Site visits as needed
- Revised inspection criteria
- **National Levee Database**



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# NLD Updates – Anticipated Early February 2019

← National Levee Database

HOME ADVANCED SEARCH DASHBOARD MAP MORE ↕ SIGN IN

MESD / Chain of Rocks East Levee System

Location **Madison, Madison County, Illinois** USACE Districts **St. Louis** FEMA Regions **5**

SUMMARY SYSTEM SEGMENTS RISK FEMA - NFIP/FIRM FEATURES PROFILE ATTACHMENTS

Project Description

VIEW

The East St. Louis and Vicinity Flood Protection Project (East St. Louis) Levee System is located in Madison and St. Clair Counties, Illinois. The project, originally constructed between the 1930s and 1950s, reduces the risk of flooding from the Mississippi River to the communities of East St. Louis, Cahokia, Sauget, Madison, Brooklyn, Venice, Fairmont City, and Granite City and many heavy and light industries, airports, transportation hubs, hospitals and numerous Superfund sites. The levee system has undergone several major modifications, including most recently projects to correct underseepage deficiencies. The system is nearly 29 miles in length and consists of two segments: the Metro East Sanitary District (MESD) levee, operated by local interests, and the Chain of Rocks East levee, operated by USACE. Together these two levee segments provide benefits to approximately 250,000 people that work or live behind the levee, with more than \$6.4 billion in land and property value. Since 2013, it is estimated that the system has prevented over \$5 billion in flood damages.

Risk Characteristics

VIEW

Levee Safety Action Risk Classification

High

People at Risk 122,643 Structures at Risk 53,933 Property Value \$13.5B

Risk Characterization Summary

The East St. Louis levee system has prevented the community from flooding during numerous major flood events, however these events have also exposed vulnerabilities in the system, and there is a possibility that in any given year floodwaters could overtop or breach the levee. A levee failure could result in flooding of depths up to 45 feet, significant loss of life, and extensive economic damage. Due to the heavily industrialized and populated region, the consequences of failure are high. Therefore, partnerships with the local sponsor, local community and USACE to implement flood risk management activities are essential.

Structure and Features

VIEW

Total Miles	Length of Embankment (miles)
34.97	31.82
Length of Floodwall (miles)	Year Constructed
3.15	No Data Entered
Average Height	Number of Closure Structures
No Data Entered	15

Key Documents

VIEW

Levee System Summary

FEMA - NFIP/FIRM Information

VIEW

Levee System Status on Effective FIRM

Accredited

USACE Rehabilitation Program

Status

Active

Latest Inspections

Segment Name	Inspection Date
Chain of Rocks East Levee	10/27/2016
Metro East Sanitary District	10/25/2016

Segments

VIEW

Metro East Sanitary District

Chain of Rocks East Levee

Map

Info

Basemap: Topographic

LEGEND

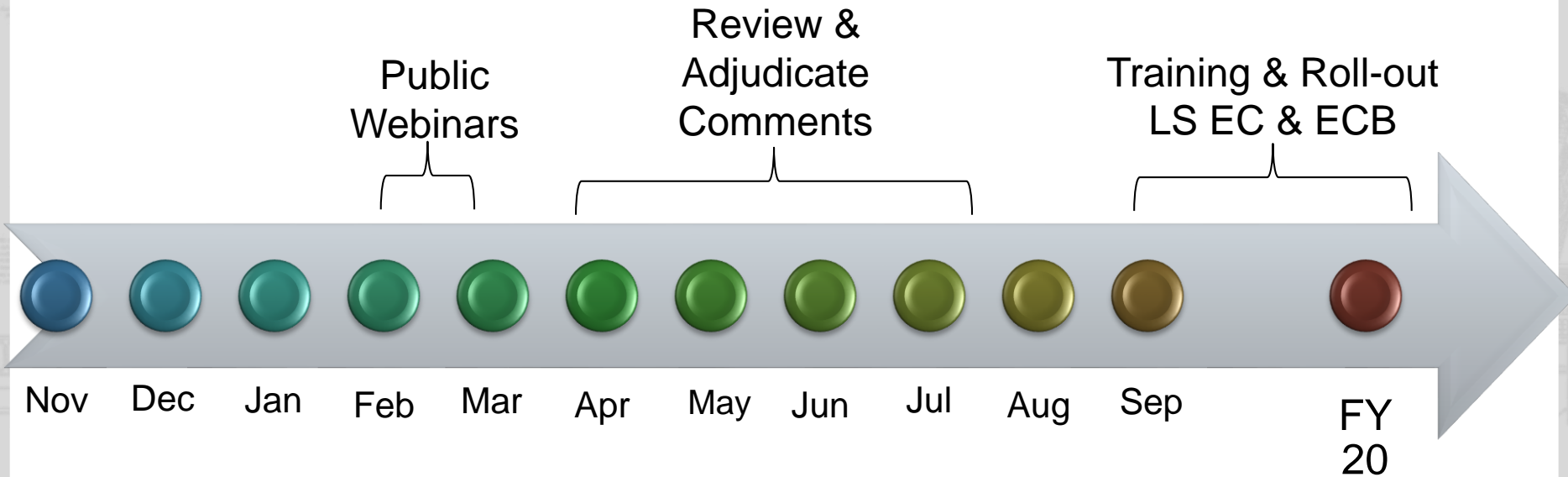
5 km

<https://levees.sec.usace.army.mil>



# LEVEE SAFETY POLICY MILESTONES

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# RISK COMMUNICATION

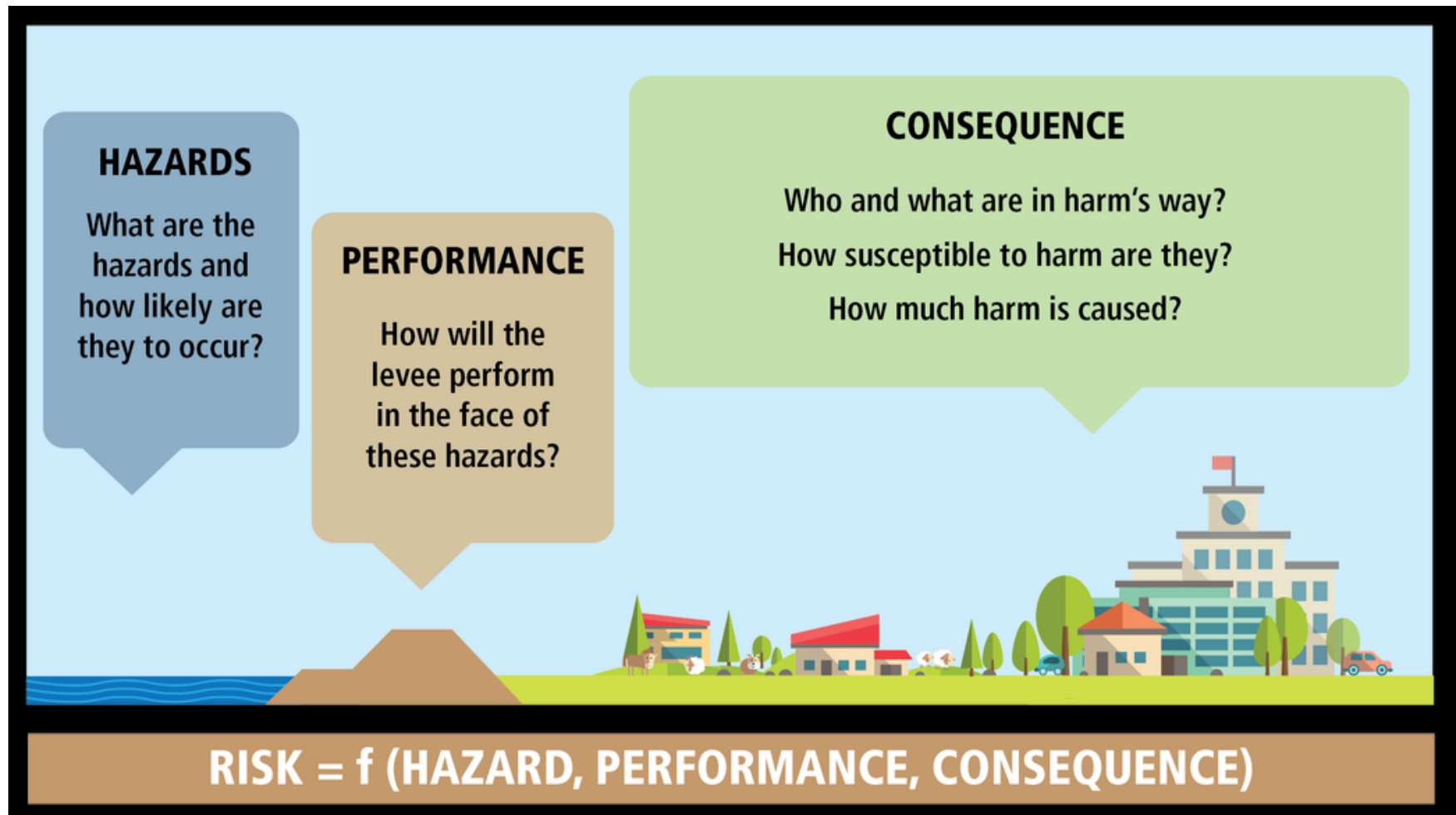
2/22/2019



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# HOW USACE DEFINES LEVEE RISK



Simplified risk informed model:

Risk = Probability of Load x Probability of Failure x Consequences



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# USACE RISK EQUATION

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## HAZARDS

What are the hazards and how likely are they to occur?

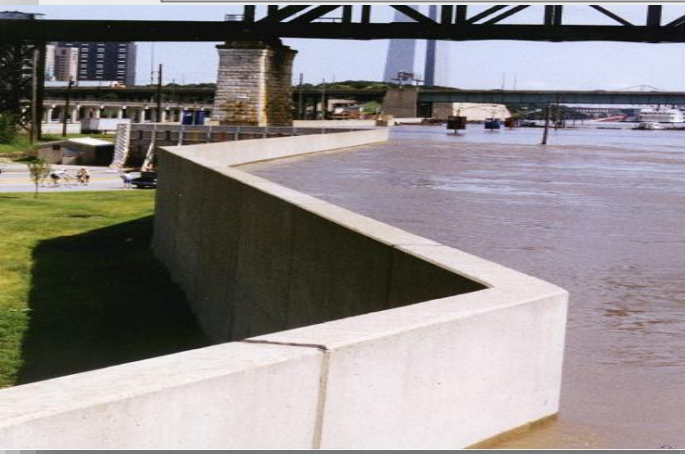
## PERFORMANCE

How will the levee perform in the face of these hazards?

## CONSEQUENCE

Who and what are in harm's way?  
How susceptible to harm are they?  
How much harm is caused?

**RISK = f (HAZARD, PERFORMANCE, CONSEQUENCE)**

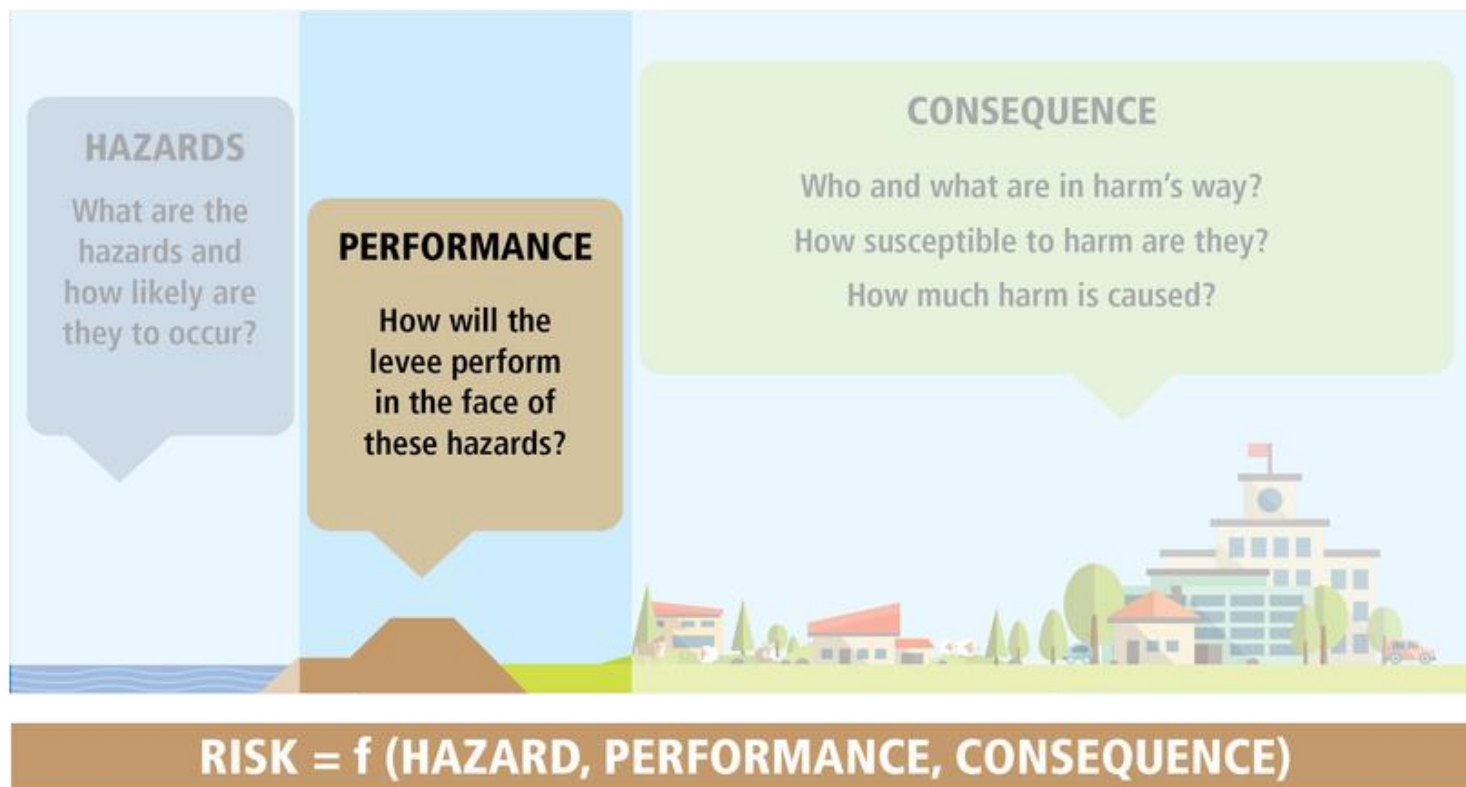


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# USACE RISK EQUATION

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# USACE RISK EQUATION

66

## HAZARDS

What are the hazards and how likely are they to occur?

## PERFORMANCE

How will the levee perform in the face of these hazards?

## CONSEQUENCE

Who and what are in harm's way?  
How susceptible to harm are they?  
How much harm is caused?

$$\text{RISK} = f(\text{HAZARD}, \text{PERFORMANCE}, \text{CONSEQUENCE})$$



# RISK COMMUNICATION – PUBLIC AWARENESS



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# LEVEE SYSTEM SUMMARY

## Contents:

- Project Description
- Risk Characterization
- What is driving the risk & What is being done about it?
- Ongoing Activities and Studies
- PL 84-99 Eligibility Status
- NFIP Status
- Risk Manager contact info



## Levee System Summary East St. Louis and Vicinity Flood Protection Project Levee System Madison and St. Clair Counties, Illinois

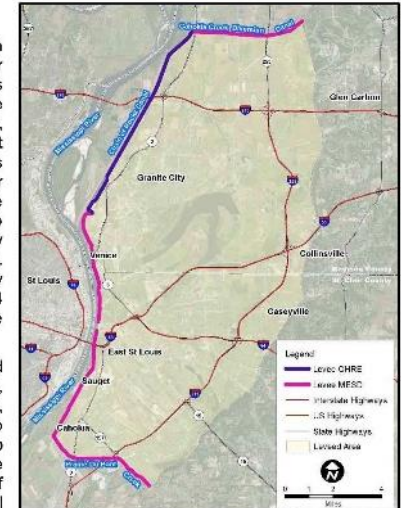
U.S. ARMY CORPS OF ENGINEERS

BUILDING STRONG

February 16, 2017

**Project Description:** The East St. Louis and Vicinity Flood Protection Project (East St. Louis) Levee System is located in Madison and St. Clair Counties, Illinois. The project, originally constructed between the 1930s and 1950s, reduces the risk of flooding from the Mississippi River to the communities of East St. Louis, Cahokia, Sauget, Madison, Brooklyn, Venice, Fairmont City, and Granite City and many heavy and light industries, airports, transportation hubs, hospitals and numerous Superfund sites. The levee system has undergone several major modifications, including most recently projects to correct underseepage deficiencies. The system is nearly 29 miles in length and consists of two segments: the Metro East Sanitary District (MESD) levee, operated by local interests, and the Chain of Rocks East levee, operated by USACE. Together these two levee segments provide benefits to approximately 250,000 people that work or live behind the levee, with more than \$6.4 billion in land and property value. Since 2013, it is estimated that the system has prevented over \$5 billion in flood damages.

**Risk Characterization:** The East St. Louis levee system has prevented the community from flooding during numerous major flood events, however these events have also exposed vulnerabilities in the system, and there is a possibility that in any given year floodwaters could overtop or breach the levee. A levee failure could result in flooding of depths up to 45 feet, significant loss of life, and extensive economic damage. Due to the heavily industrialized and populated region, the consequences of failure are high. Therefore, partnerships with the local sponsor, local community and USACE to implement flood risk management activities are essential.



### What is driving the risk?

Historically, seepage has been observed along the system during floods. While some water seeping through and under the levee is normal in this region, there are places along this levee where seepage has been severe enough to move soil particles from beneath the levee and deposit the material on the landside of the levee in the form of sandboils, which weakens the levee. The original features used to control these effects are old and no longer effective. The extent of any damage sustained within the levee soils due to sand boils and seepage from previous flood events is not known.

The leveed area is and has historically been highly industrialized. Over the years, industries have installed pipes to discharge storm water through and under the levee system, some of which have fallen into disrepair. When pipes are damaged, water can be transmitted through and begin to carry levee soils into the pipe. This weakens the levee embankment. Additionally, heavy seepage and sink holes have been observed around these pipes in recent high water events confirming their poor condition and indicating that some levee material has already been lost.

### What is being done about it?

MESD and USACE have staff dedicated to the routine maintenance necessary for effective levee operation. Extensive rehabilitation of features designed to control impacts of seepage has recently been completed on the Chain of Rocks levee, which has greatly increased the ability of this segment to withstand future floods. Along the MESD segment, the local sponsor has begun making repairs, however additional work is needed. To reduce likelihood of failure due to the underseepage, the Sponsors should continue rehabilitating seepage control and implementing a vigilant levee monitoring program, especially in locations where repairs are incomplete.

Efforts are underway by the local sponsor to properly seal abandoned pipes and repair damaged pipes that are still in use, however, the condition of many pipes along the MESD segment is unknown. To reduce likelihood of failure due to the weaknesses associated with underseepage and pipes, the Sponsors should complete inspection of all pipes, implement repairs accordingly, and continue a vigilant levee monitoring program.

# INSPECTION SCHEDULES

2/22/2019



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# 2019 INSPECTIONS

Periodic Inspections			
System	State	Status	
Monarch Chesterfield Levee System	MO	Complete	
Festus-Crystal City Levee System	MO	Spring '19	
Grand Tower and Degognia Levee System	IL	Partially Complete	
Consolidated North County Levee System	MO	Weather Delay	
Meredosia, New Pankeys Pond, Mud Creek, Indian Creek, Willow Creek North	IL	Complete	
Routine Inspections			
System	State	System	State
Augusta Bottoms & Dutzow Bottoms System	MO	Pike Grain No 2 System	MO
Big Five Levee System	IL	Pike Grain No 3 System	MO
Brevator Levee System	MO	Pike Grain No 4 System	MO
Darst Levee System	MO	Prairie Du Pont & Fish Lake System	MO
Earth City Levee District System	MO	Riverport Levee District System	IL
Elsberry / King's Lake System	MO	Sandy Creek Levee System	MO
Greens Bottom Section 2 Levee System	MO	City of St. Louis System	MO
Harrisonville, Stringtown, Ft. Chartres System	IL	St. Genevieve Levee System No. 2	MO
Keach Drainage & Levee District System	IL	Wood River D&LD Upper System*	MO
Metro East & Chain of Rocks System	IL	Wood River D&LD Lower System*	IL
Mo University Levee System	MO	Wood River D&LD East and West System*	IL
Pike Grain No 1 System	MO	*complete	



# 2020 INSPECTIONS (TENTATIVE)

## Periodic Inspections

System	State	*Periodic Assessment
Big Five (PA)	MO	
Harrisonville, Stringtown and Ft. Chartres*	MO	
MESD and Chain of Rocks	IL	
Nutwood	IL	
St. Peters Old Town*	MO	
Valley Park	IL	

## Routine Inspections

System	State	System	State
Big Swan Levee System	IL	Kaskaskia Island Levee System	IL
Bluffdale Levee System	IL	Kuhs Levee System	MO
Bois Brule Levee System	MO	Lakeside 370 Levee System	MO
Cape Girardeau Flood Protection System	MO	Mauvaise Terre Levee System	IL
Columbia Drainage & Levee District System	IL	McGee Creek Levee System	IL
Coon Run SE Systems	IL	Prairie du Rocher & Edgar Lake System	IL
Dively Drainage & Levee District System	IL	Robertson Mutual Levee System	IL
Eldred Drainage & Levee District System	IL	Schafer Levee System	IL
Elm Point Levee System	IL	Scott County Drainage & Levee District System	IL
Germantown Levee System	IL	Spankey Drainage & Levee District System	IL
Hanover Levee System	IL	St. Genevieve No. 3 Levee System	MO
Hartwell Drainage & Levee District System	IL	St. Peters No. 1 Levee System	MO
Howard Bend Levee System	MO		

# HANDOUTS

- Draft Levee System Summaries  
**WE NEED YOUR FEEDBACK!**
- Sponsor Handbooks
- Pipe Inspection Fact Sheets

**<http://www.mvs.usace.army.mil/>**

(See Quick Links "Levee Safety" – bottom left of the screen)

- Inspections and Risk Assessment Information
- Levee Safety Documents
  - Bi-annual Maintenance Log
  - Pipe Inspections and Relief Well Maintenance
  - Templates and Guidance Documents
- Contact Us



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# THANK YOU

## CONTACT INFO:

Rachel Lopez, P.E.

Levee Safety Program Manager

314-331-8425

[Rachel.L.Lopez@usace.army.mil](mailto:Rachel.L.Lopez@usace.army.mil)

Josh VerDught, P.E.

Chief, Dam and Levee Safety Section

314-331-8420

[Joshua.S.VerDught@usace.army.mil](mailto:Joshua.S.VerDught@usace.army.mil)



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# USACE: PL 84-99



*"The views, opinions and findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."*



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# PL 84-99 Program Overview

## The Repair Process:

- After the flood event, Request for Assistance (RFA) and Non-Structural Alternatives (NSA's) are sent to all levee districts.
- Levee districts have 30 days to return these documents to St. Louis District (MVS).
- MVS assesses flood damages within its area of responsibility.
  - Debris should be removed from the levee so that the engineering teams can assess the damages (Damage Survey Report – DSR).
- Using the DSR and inputs from other branches within MVS, a Project Information Report (PIR) is prepared.
  - A Levee District must be active within the USACE Rehabilitation and Inspection Program (RIP) to be eligible for Flood Control and Coastal Emergency (FCCE) funding authorized by PL 84-99.
  - To qualify, the total repair cost must exceed \$15,000 and have a Benefit to Cost (BC) ratio greater than 1.0.
- Once the PIR is approved by Division, funds for E&D and an Environmental Assessment (EA) are requested.
- Once Plans & Specs and the EA are ready, funds for Construction are requested for KT Award.
- Construction Costs:
  - Federal levees: repaired at 100% federal expense.
  - Non-federal levees: repaired at 80% / 20% cost share
- The Levee District must provide lands, easements, and Right of Way (ROW) for the repairs.









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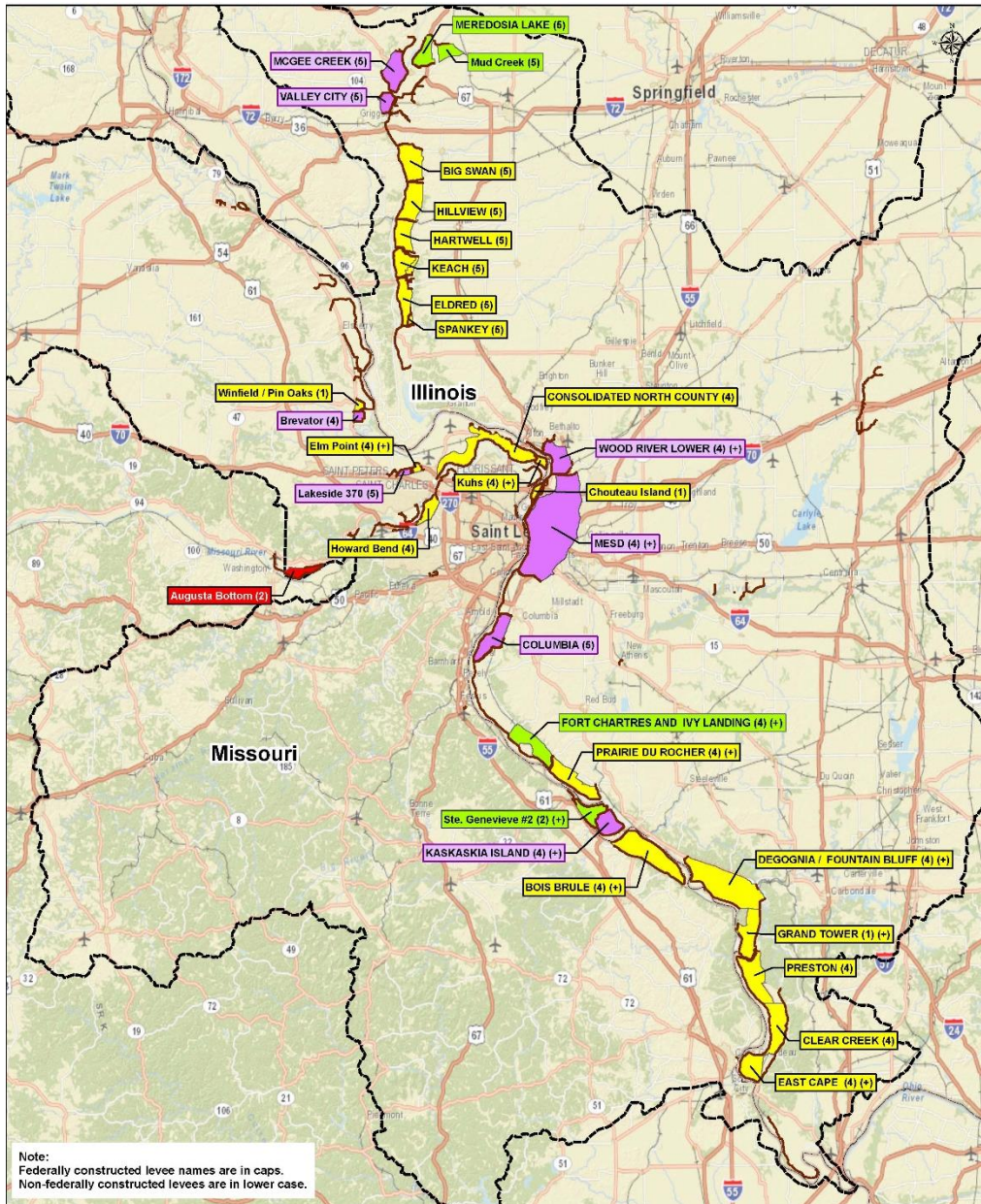




# 2015-2017 Flood Repair Projects

## Legend

-  Levee
-  MVS District
-  2017 Damage; Under Construction
-  2015 Damage; Under Construction
-  2015 Damage; Construction Complete
-  2015 Damage; Notice of Project Completion



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# PL 84-99 Program

## **Current Status:**

- All projects have been awarded. The line of protection has been established within each affected project.
- Work at Ft. Chartres and Columbia is being impacted by high river levels.
- Work at Mud Creek, Meredosia St. Genevieve, and Augusta Bottom is being impacted by wet weather and site conditions

## **What you can do for MVS:**

- Return Cooperation Agreement to Project Manager (PM) ASAP.
- Notify PM of potential problems providing lands and easements.
- Return Real Estate documentation (Authorization for Entry and Attorney Certification) to MVS ASAP.



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# Thank you...

## CONTACT INFO:

Rob Heer, P.E., PMP  
(O) 314-331-8235  
Robert.W.Heer@usace.army.

mil



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# 2019 FLOOD PREPAREDNESS

**Jeremy Eck**

ICW Program Manager

St. Louis District Section 408 Coordinator

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# SECTION 408 AND PL84-99 PROGRAMS

- **Jeremy Eck**, ICW Program Manager and 408 Coordinator
- Alterations
  - Section 408 for Federal Systems
  - Levee Safety Compliance Review for Non-Fed's
- Risk Communication
- Routine & Periodic Inspections
  - Outbriefs
  - Eligibility
- System-Wide Improvement Framework (SWIF) Program
- Technical Support



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# SECTION 408 PERMISSIONS

- New Guidance
  - *Interim Policy Memos & EC 1165-2-220*
- Provides USACE authority to grant permission to alter a USACE civil works project if
  1. *Does not impair usefulness of the project*
  2. *Not injurious to the public interest*
- Non-federal sponsors can request cursory reviews to ensure the safety of their levee system

# PL84-99 ELIGIBILITY

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- Interim Policy for Determining Eligibility dated March 21, 2014
- 18 Eligibility Items
- Non-federal sponsors must request Initial Eligibility Inspections (IEI) formally



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# SWIF'S

- System-Wide Improvement Framework Program (SWIF)
  - Nov 29, 2011 Policy
- Letter of Intent (LOI)
  - 2 years eligibility
- SWIF Plan
  - 2 years eligibility
  - 1 year extension possible
- Possible Improvements Coming



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# MAJOR POINTS

- Participate in Inspections
- Maintenance Update – Provide Semi-Annually
- Prepare for Potential Flooding
  - Drains / Gates
  - Pump Stations – Power, Fuel, Operator
  - Drive the System
- Update Contacts
- Help Us Help You

