

# JAMESTOWN – PIPESTEM OPERATIONS PUBLIC MEETING

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Omaha District

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# PRESENTATION OVERVIEW

- Water Control operations since September
- Current reservoir conditions
- Current reservoir forecasts
- Regulation options considered
- Fall-Winter regulation
- A look at Spring



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# JAMES RIVER OPERATIONS

## Pipestem Reservoir

- Corps of Engineers project

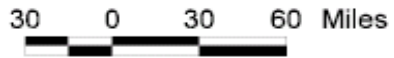
## Jamestown Reservoir

- Bureau of Reclamation project regulated by Corps when pool level is in flood control zone



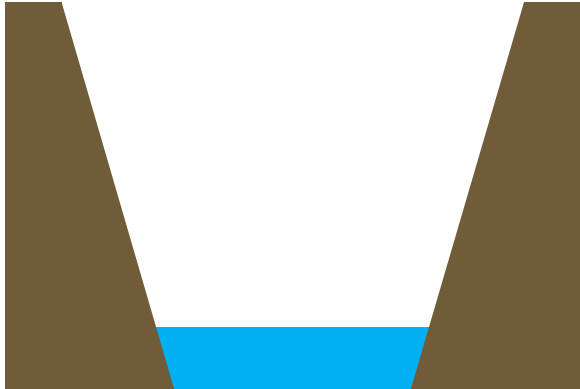
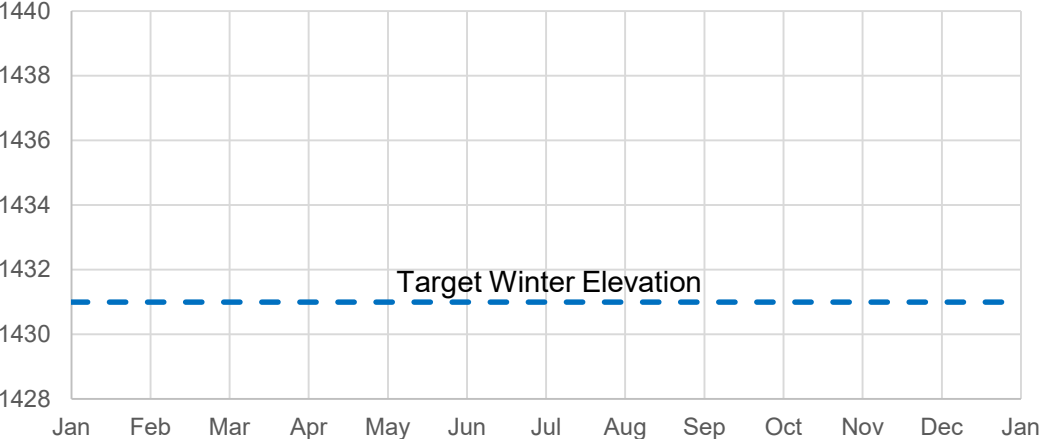
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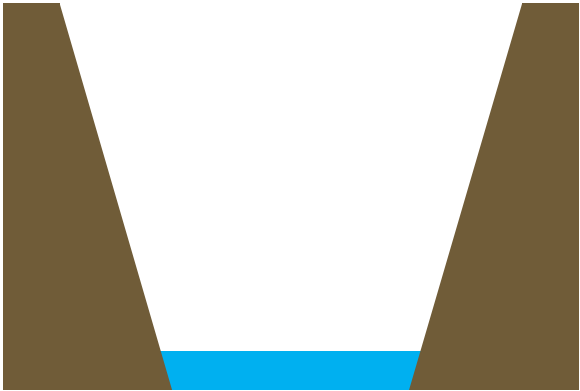
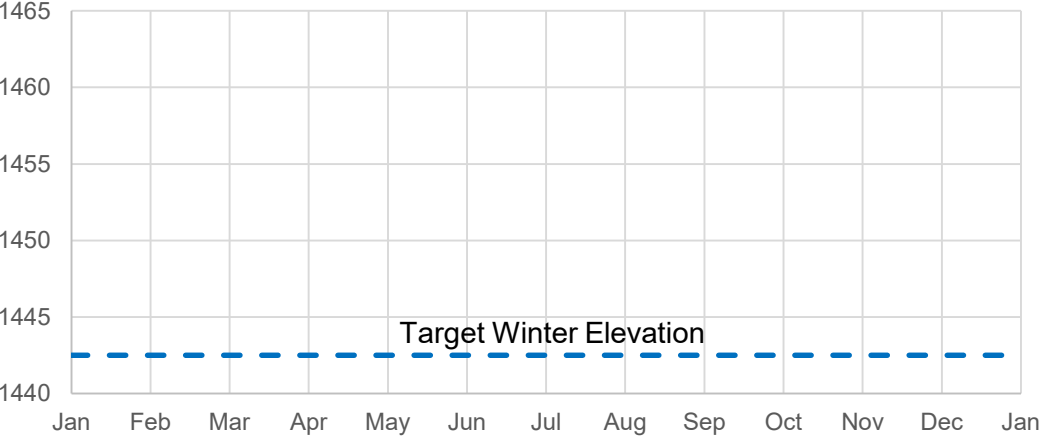


# NORMAL OPERATIONS

### Jamestown Elevation



### Pipestem Elevation

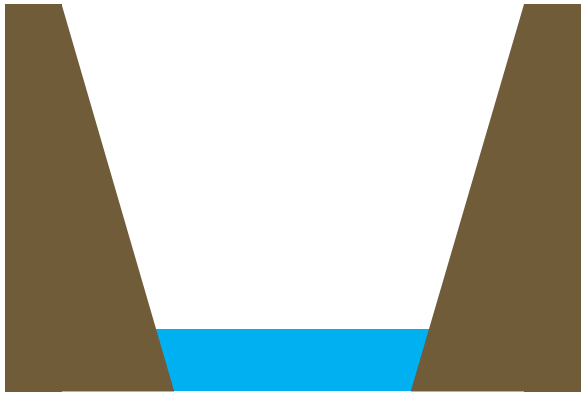


# NORMAL OPERATIONS

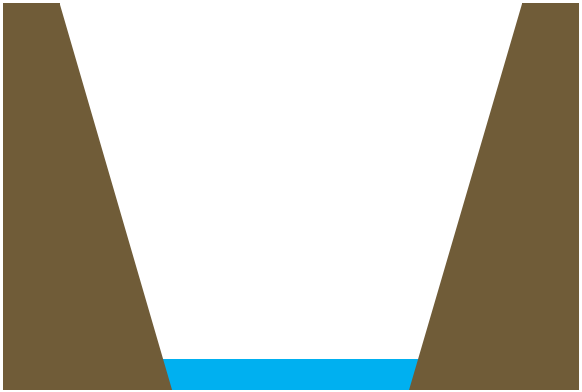
Jamestown Elevation



Releases

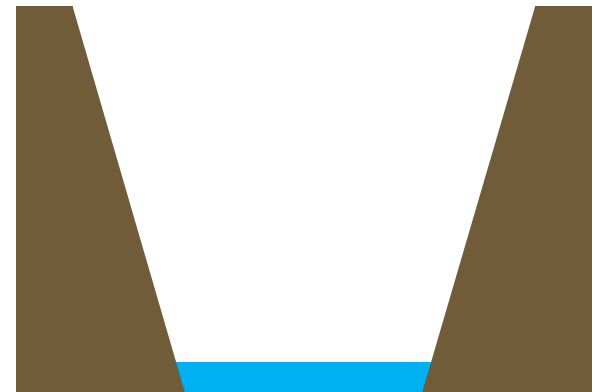


Pipestem Elevation



# CONDITIONS ON SEPTEMBER 20, 2019

	Jamestown Dam	Pipestem Dam
Inflow	40 cfs	42 cfs
Outflow	75 cfs	70 cfs
Elevation	1430.3 ft	1443.4 ft
% Flood Control	0%	0.6%

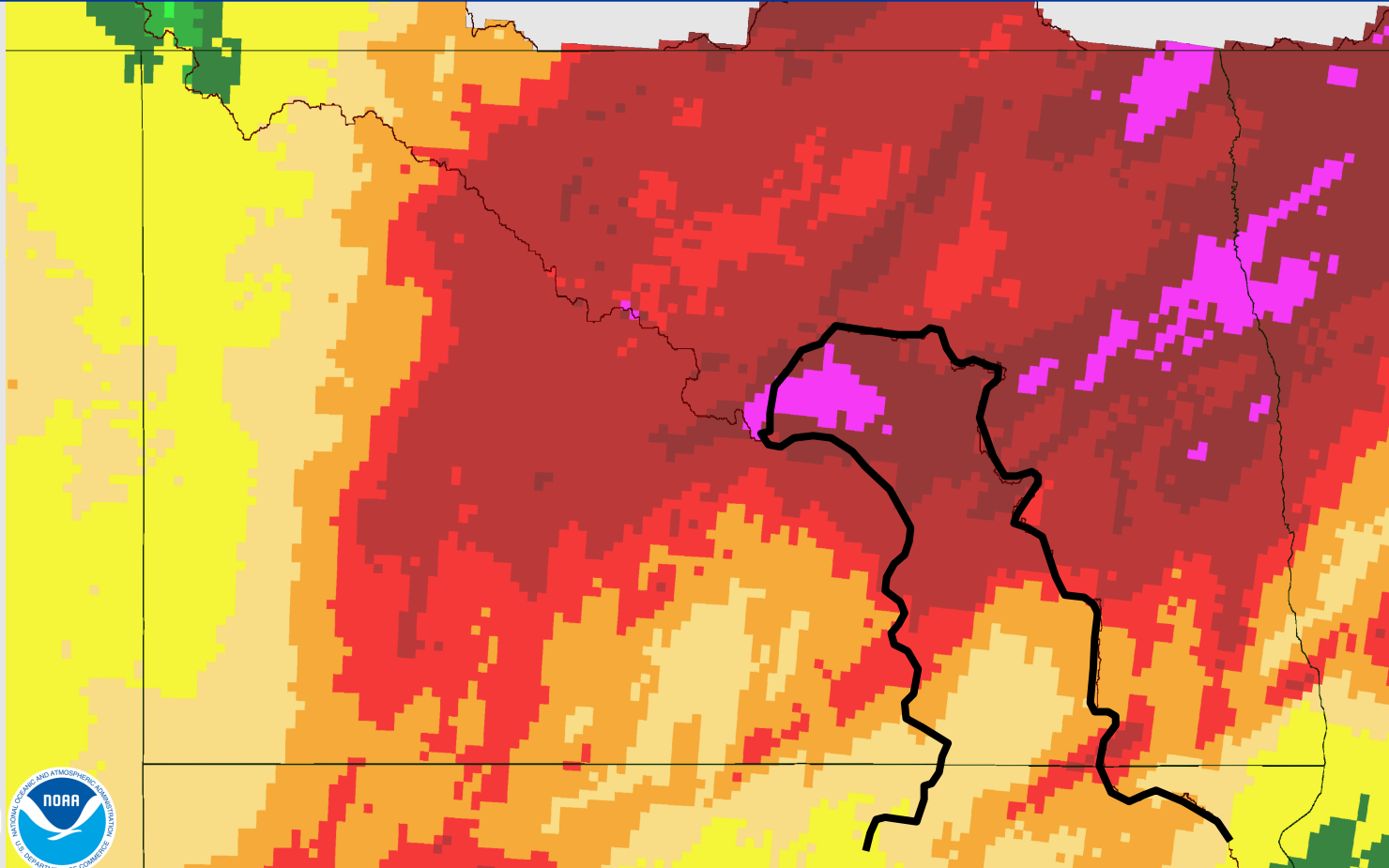


# OBSERVED PRECIPITATION SEP 20 – OCT 20

October 20, 2019 30-Day Observed Precipitation

Created on: October 21, 2019 - 16:21 UTC

Valid on: October 20, 2019 12:00 UTC



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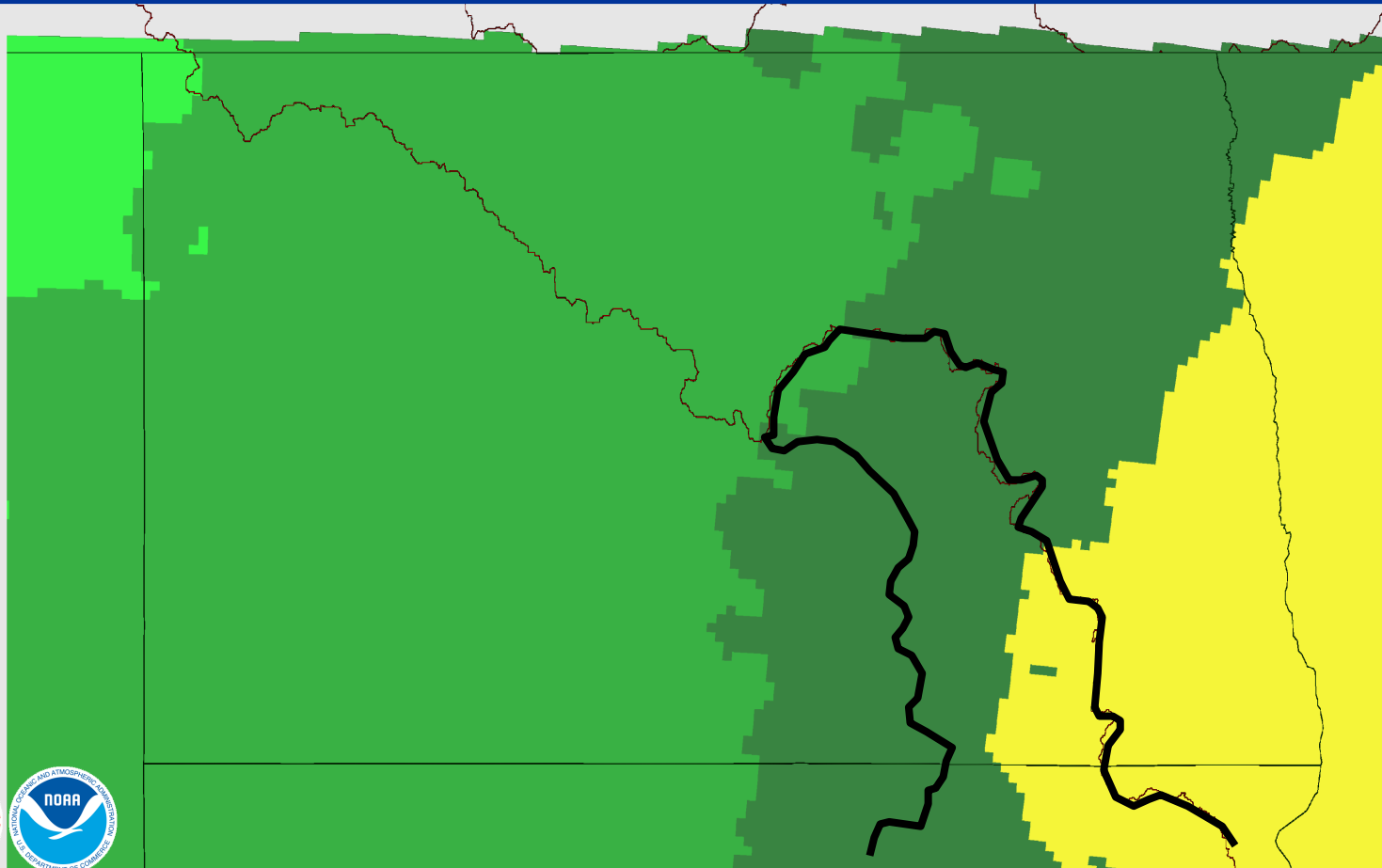


# NORMAL PRECIPITATION SEP 20 – OCT 20

October 20, 2019 30-Day Normal Precipitation

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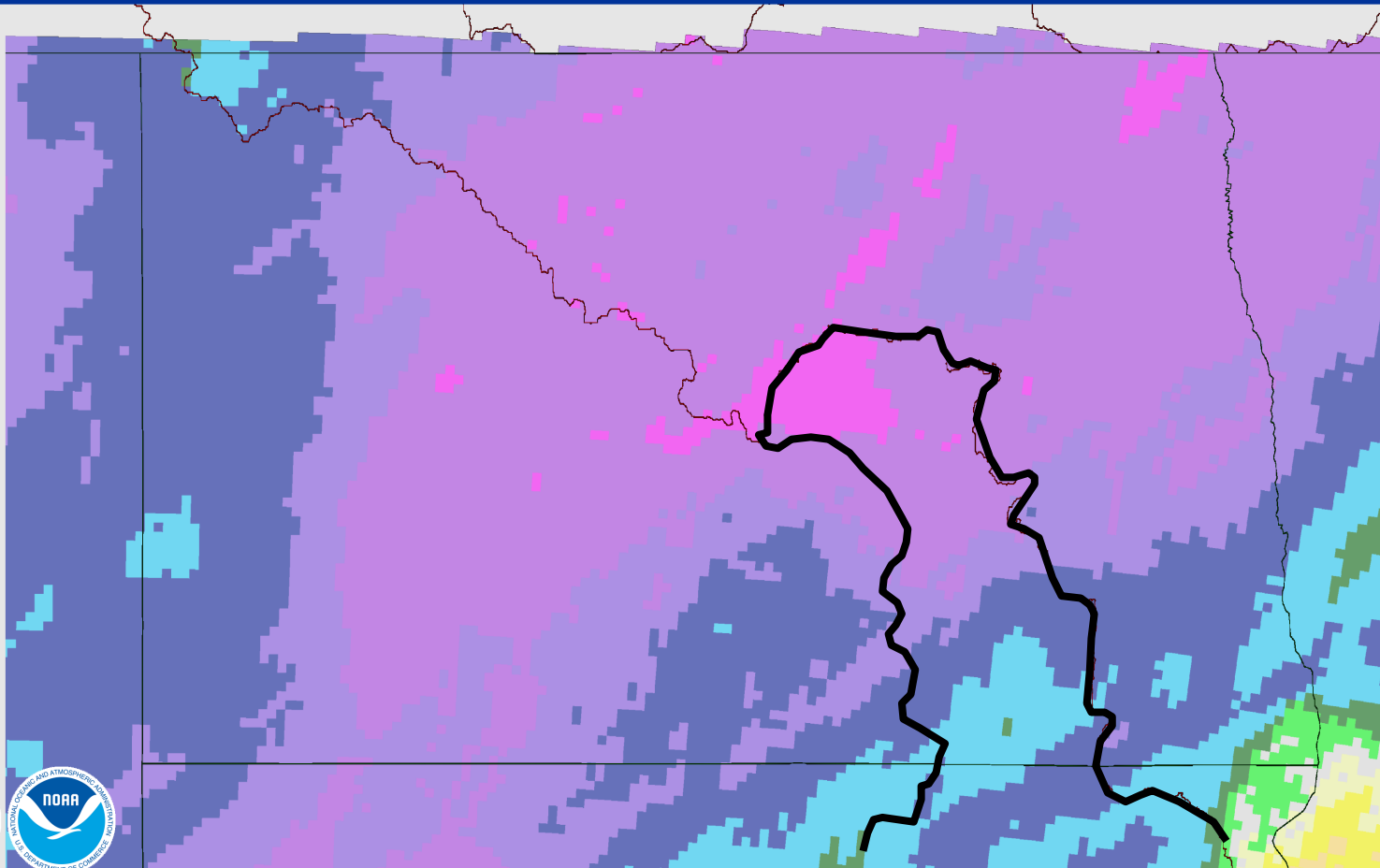


# PERCENT OF NORMAL SEP 20 – OCT 20

October 20, 2019 30-Day Percent Precipitation

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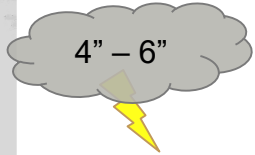
Valid on: October 20, 2019 12:00 UTC



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Date	Jamestown Releases (cfs)	Pipestem Releases (cfs)	Combined Releases (cfs)
September 20	75	80	155
September 23	400	400	800
October 1	400	600	1,000
October 5	600	600	1,200
October 7	600	700	1,300
October 11	600	800	1,400
October 13	800	800	1,600
October 14	1,000	800	1,800
October 22	1,200	800	2,000
October 26	1,200	1,200	2,400



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# CURRENT RESERVOIR CONDITIONS

## September 20, 2019

### Jamestown Reservoir

- Inflow – 40 cfs
- Outflow – 75 cfs
- Elevation – 1430.3 ft
- 0% flood pool occupied

### Pipestem Reservoir

- Inflow – 42 cfs
- Outflow – 70 cfs
- Elevation – 1443.4 ft
- 0.6% flood pool occupied

## October 27, 2019

### Jamestown Reservoir

- Inflow – 3,500 cfs and peaking
- Outflow – 1,200 cfs
- Elevation – 1439.8 ft and rising
- 21% flood pool occupied

### Pipestem Reservoir

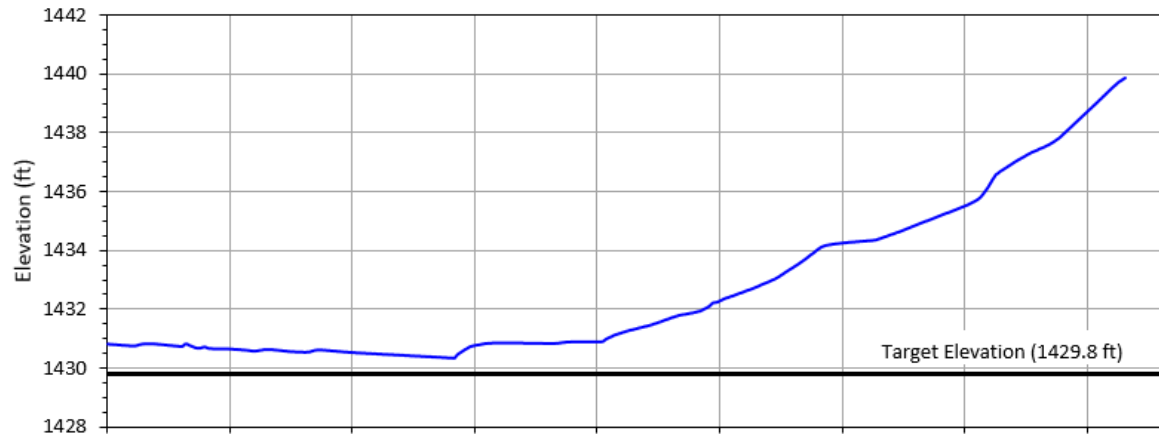
- Inflow – 1,300 cfs and falling
- Outflow – 1,200 cfs
- Elevation – 1475.0 ft and peaking
- 43% flood pool occupied



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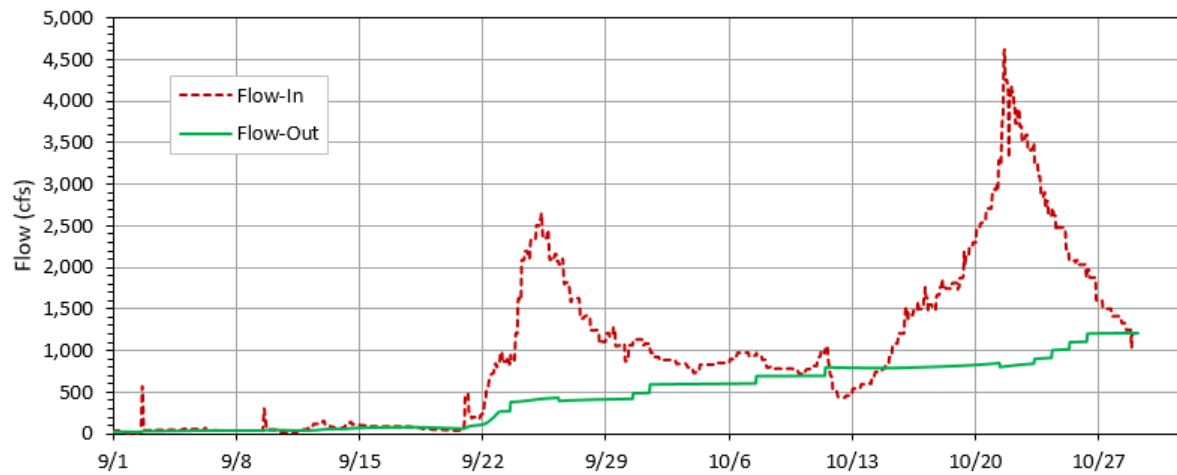
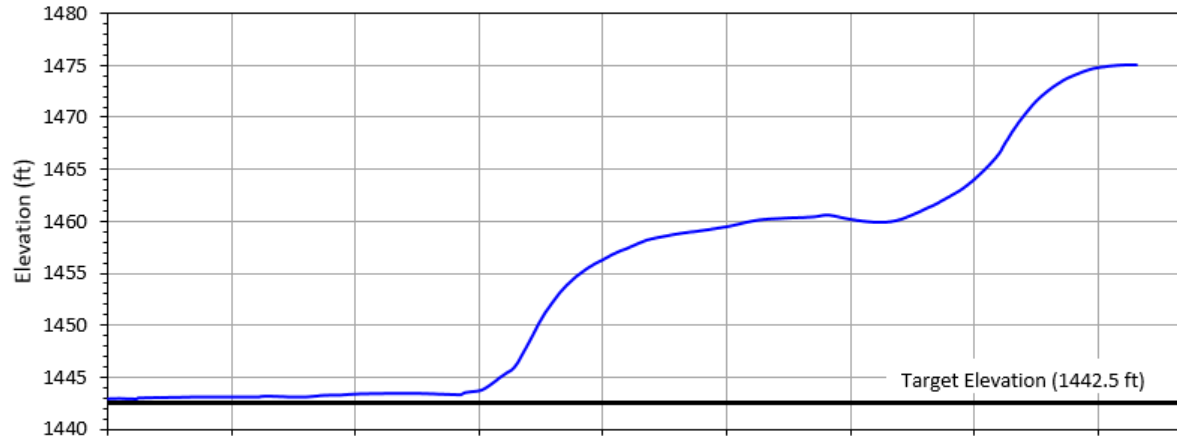
# JAMESTOWN DAM CURRENT CONDITIONS



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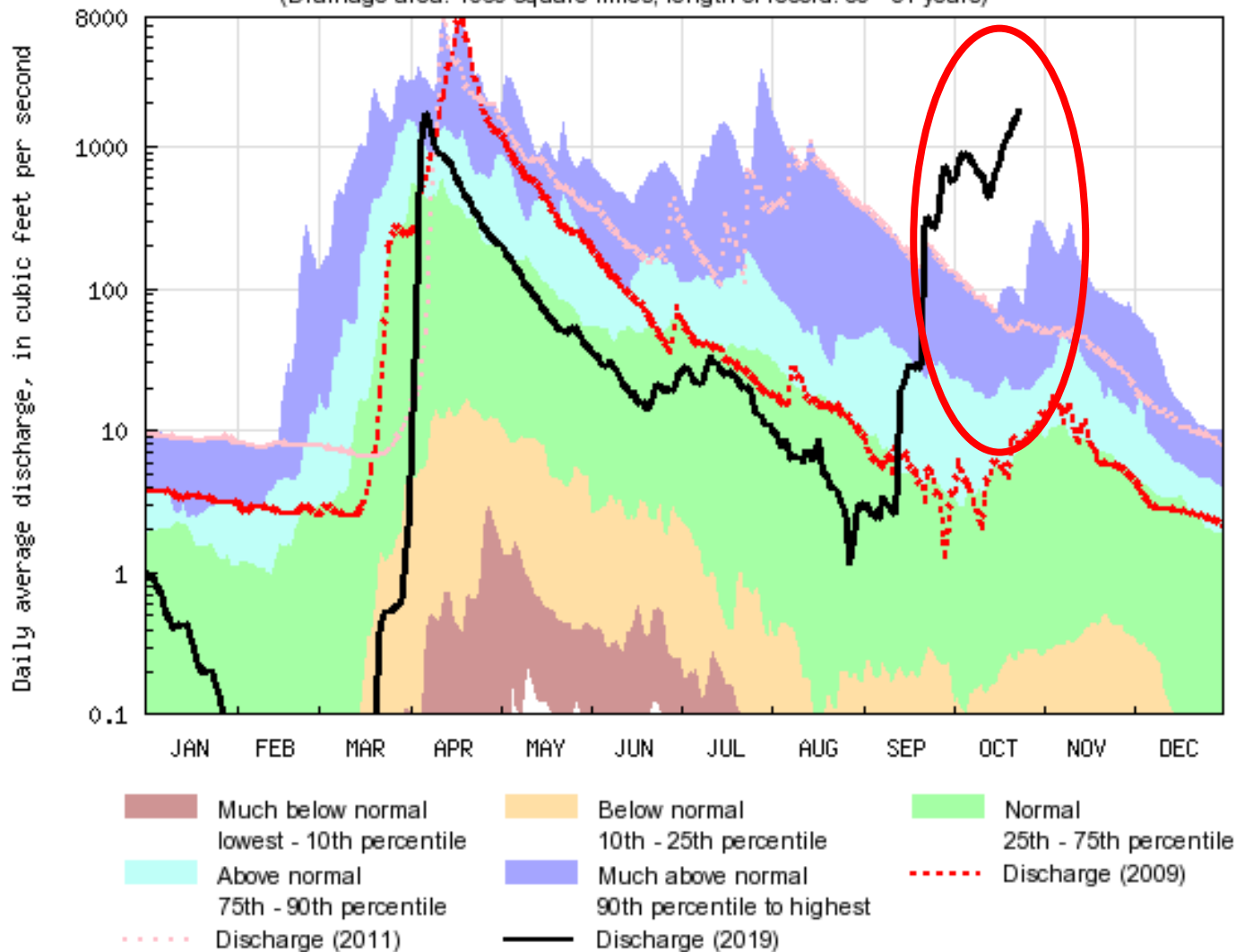
# PIPESTEM DAM CURRENT CONDITIONS



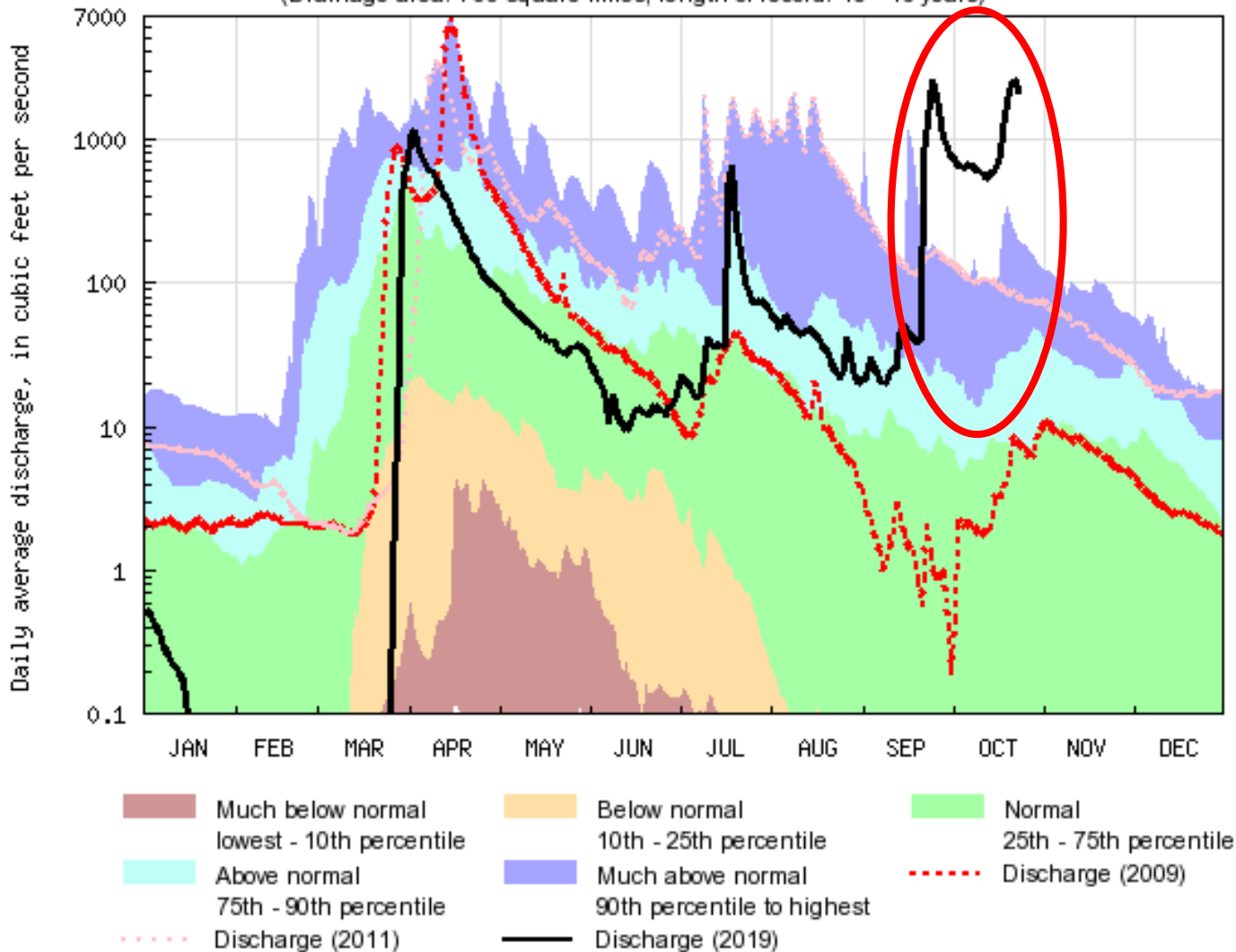
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USGS 06468170 JAMES RIVER NR GRACE CITY, ND  
 (Drainage area: 1060 square miles, length of record: 50 - 51 years)

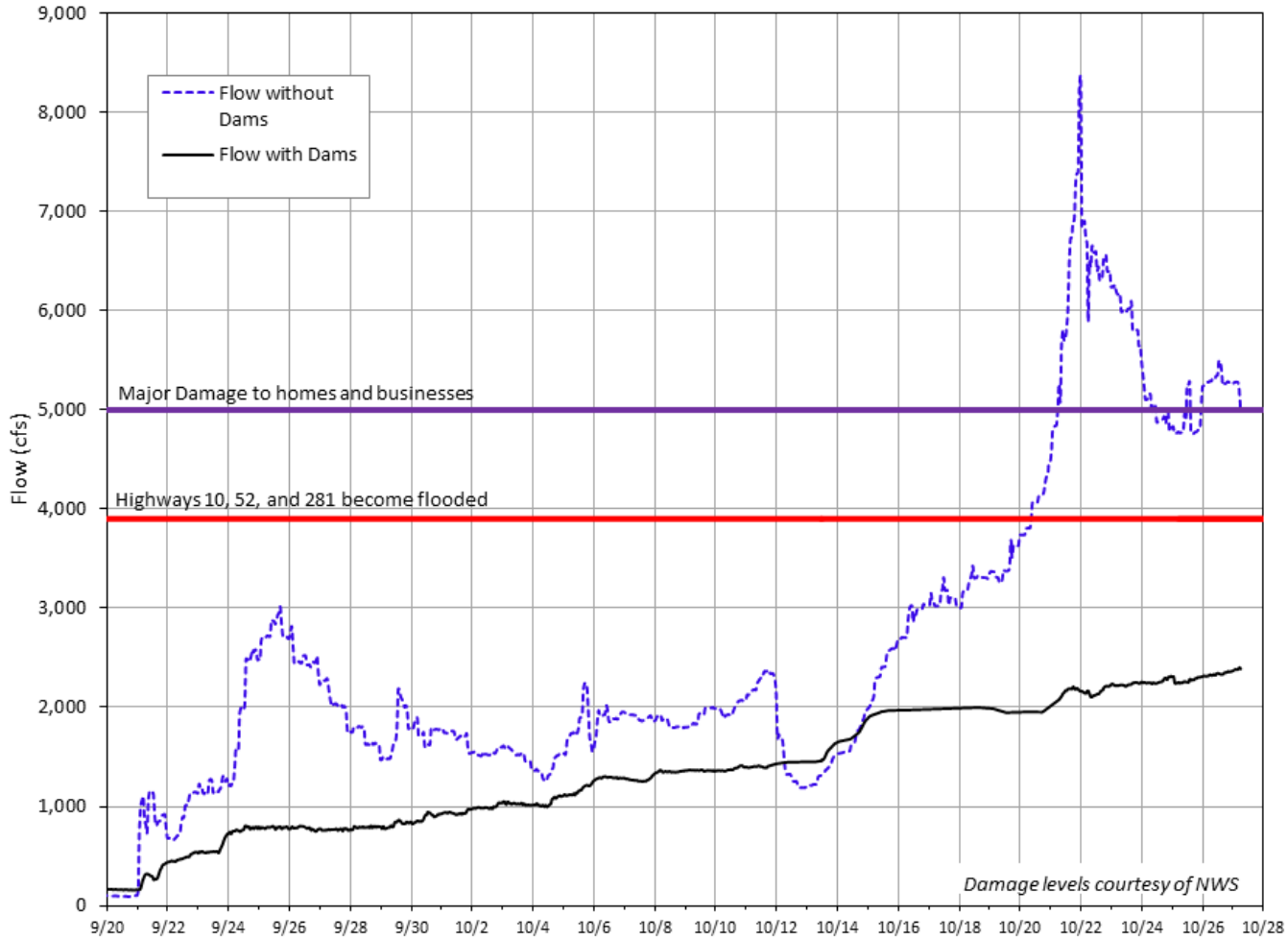


USGS 06469400 PIPESTEM CREEK NR PINGREE, ND  
 (Drainage area: 700 square miles, length of record: 45 - 46 years)





# JAMESTOWN UNREGULATED FLOW



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# WATER CONTROL PLAN

Jamestown and Pipestem flood control pools operate jointly using a flexible release plan

- Range of releases depends on:
  - Forecast combined runoff volume into the reservoirs
  - Agency objectives
- Types of Flow Years (combined runoff volume)
  - Low                      0 – 90,000 af
  - Medium                 90,000 – 160,000 af
  - High                      > 160,000 af



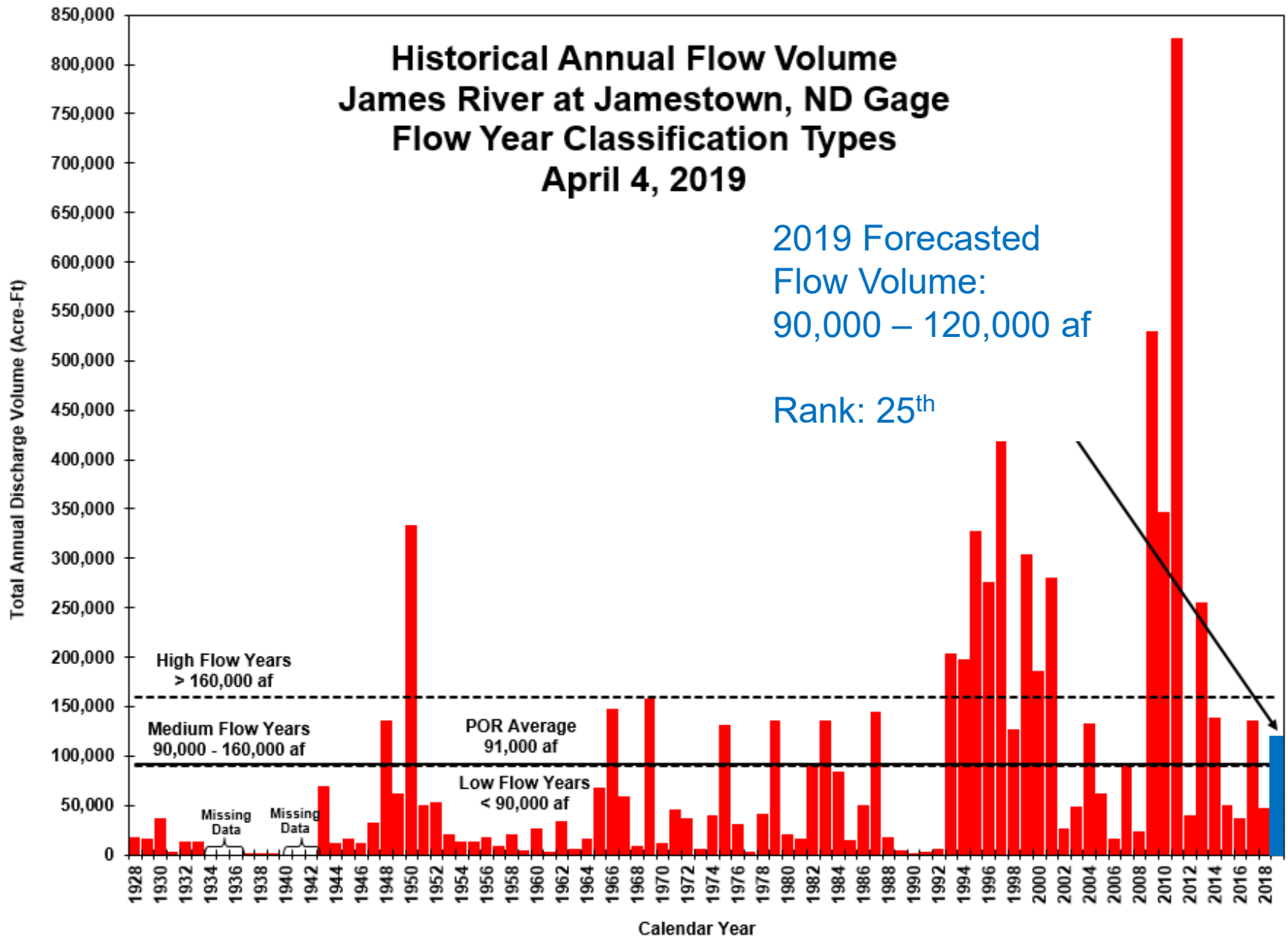
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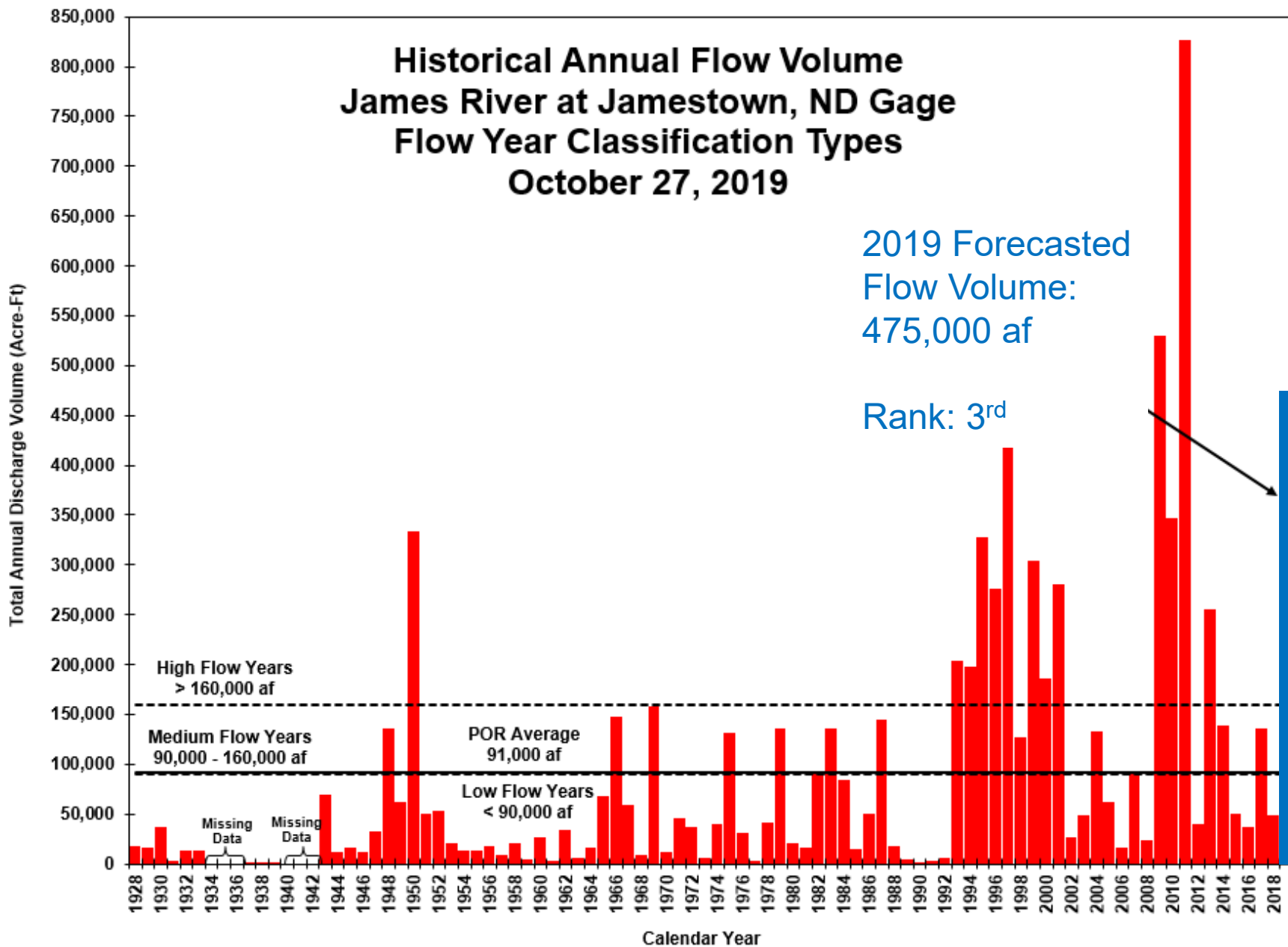
# Historical Annual Flow Volume James River at Jamestown, ND Gage Flow Year Classification Types April 4, 2019

2019 Forecasted  
Flow Volume:  
90,000 – 120,000 af

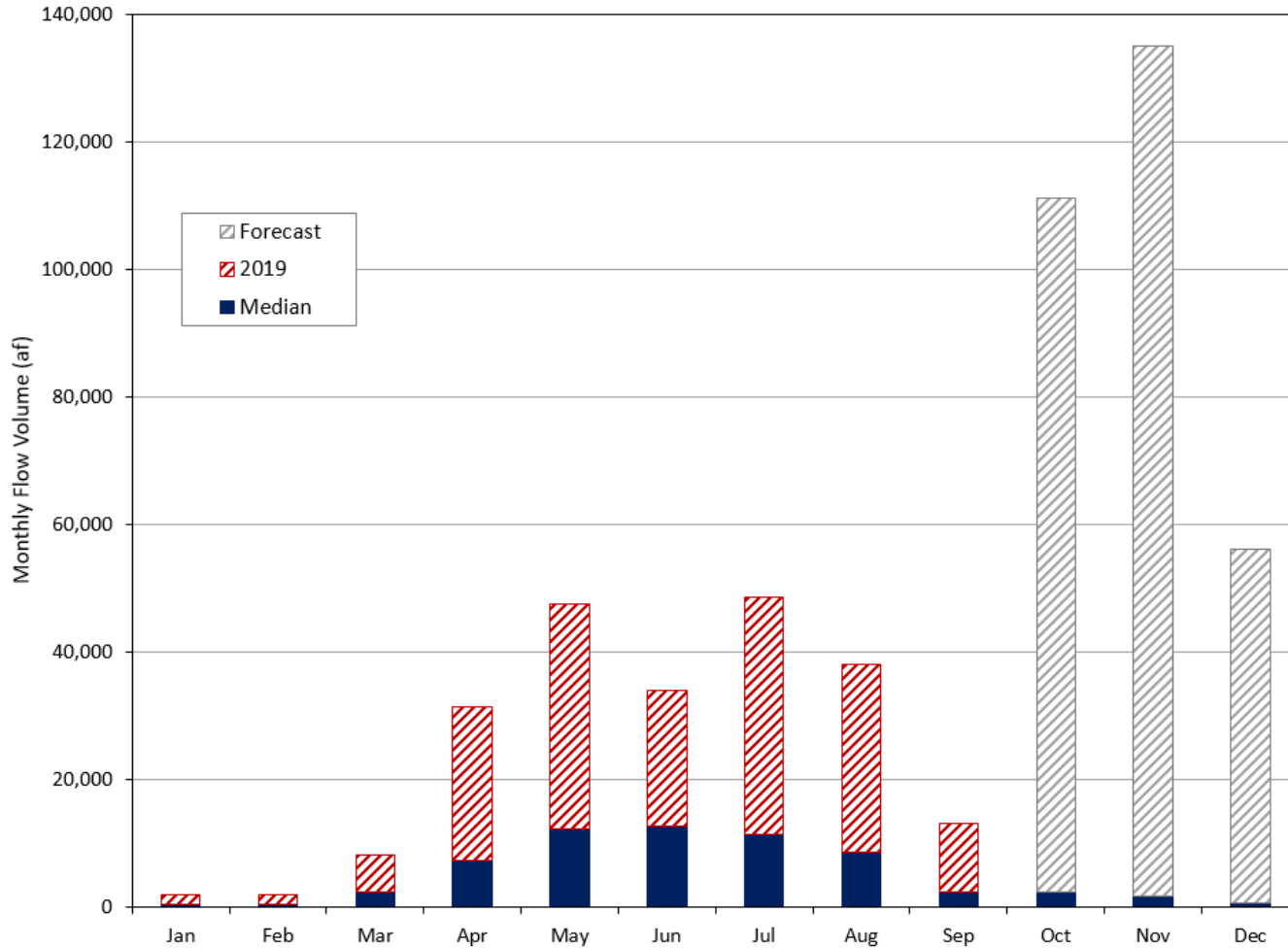
Rank: 25<sup>th</sup>



# Historical Annual Flow Volume James River at Jamestown, ND Gage Flow Year Classification Types October 27, 2019



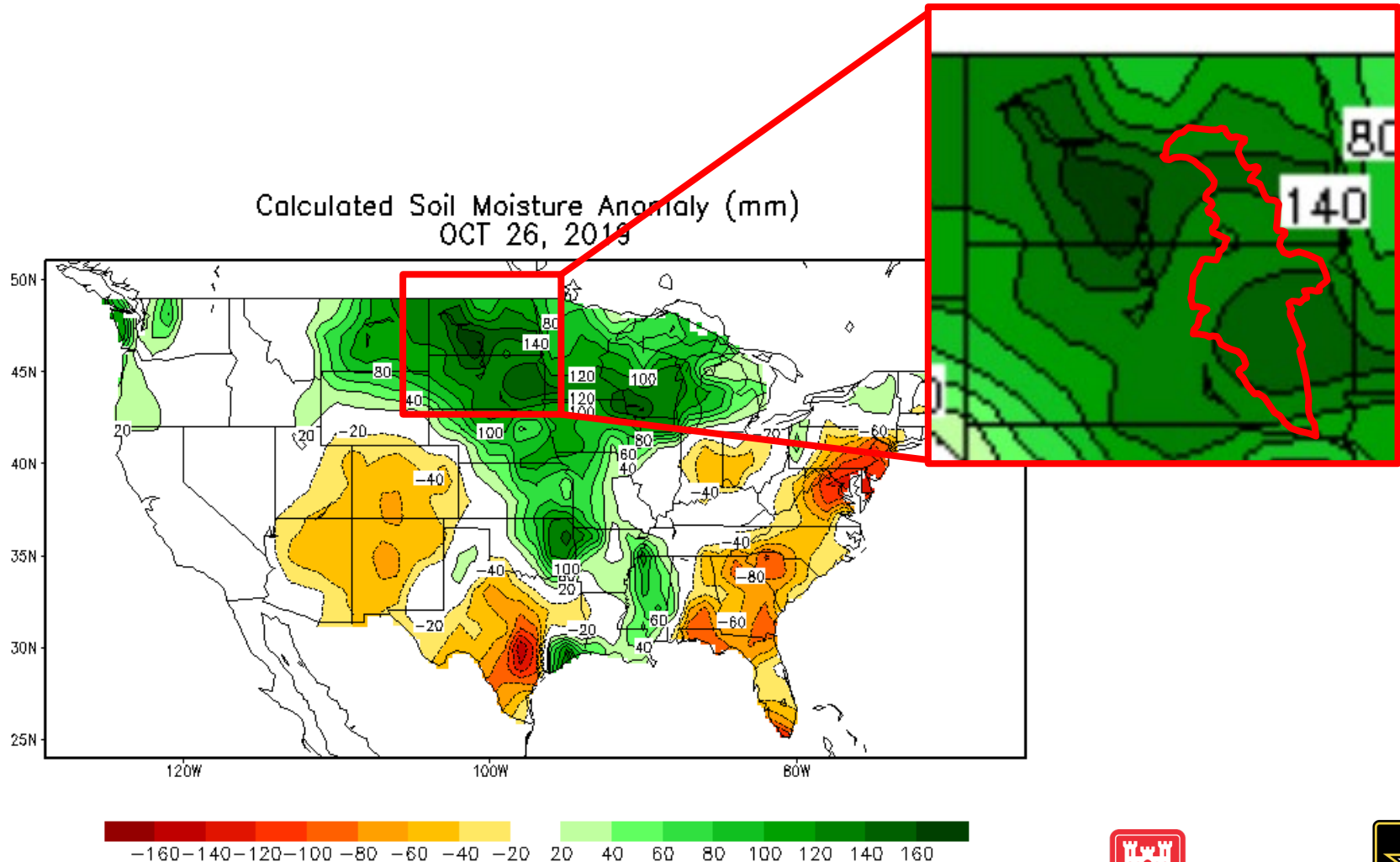
# JAMESTOWN GAGE – NORMAL VS. 2019 FLOWS



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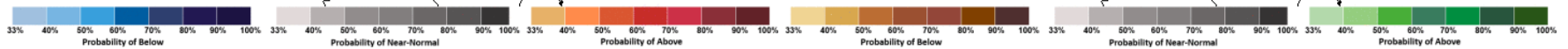
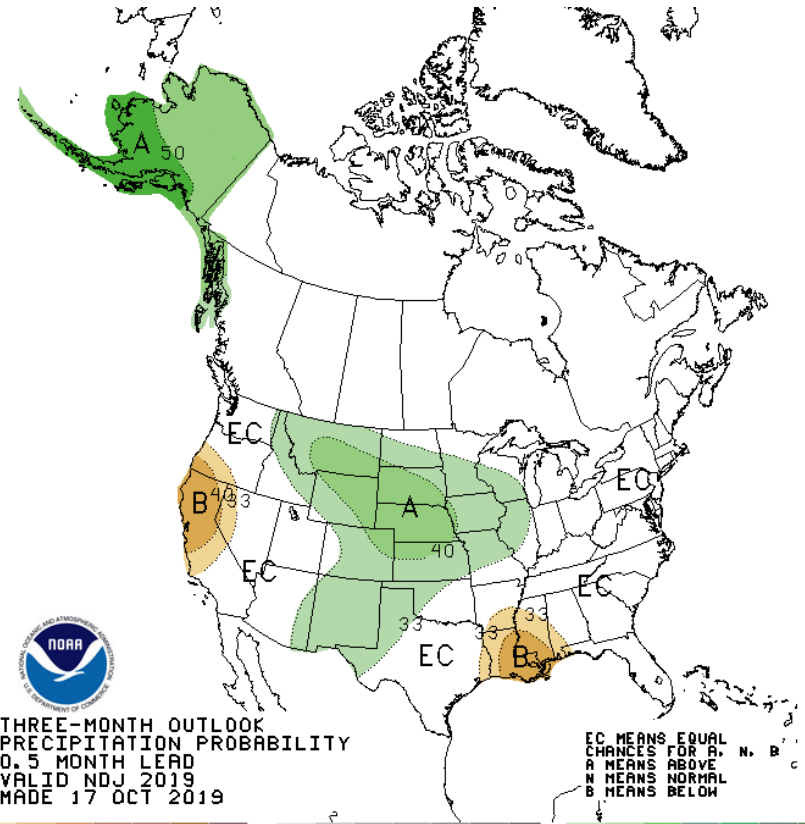
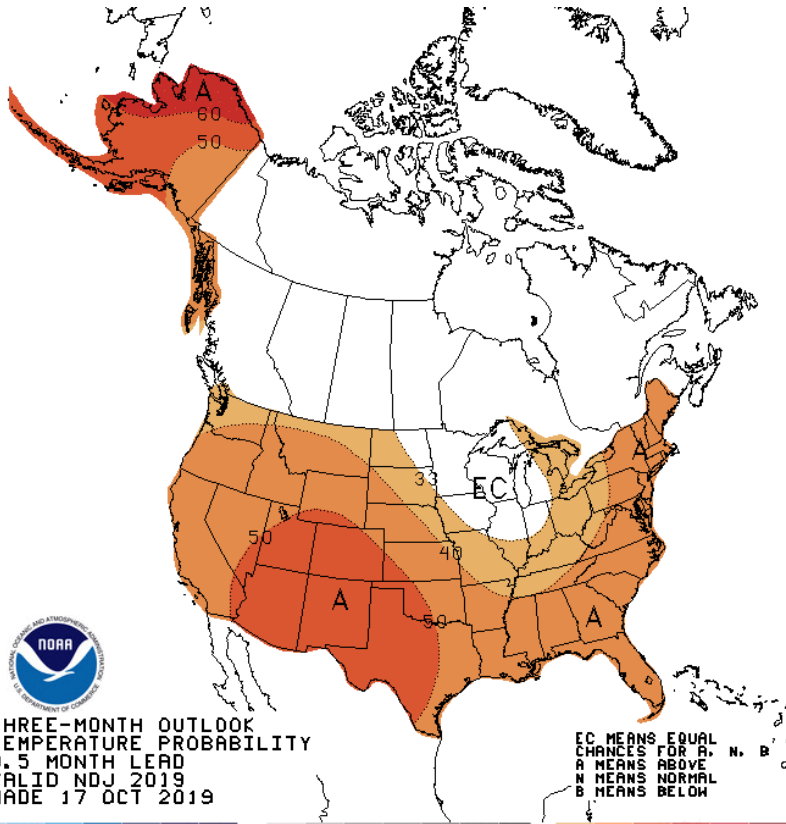
# SOIL MOISTURE CONDITIONS



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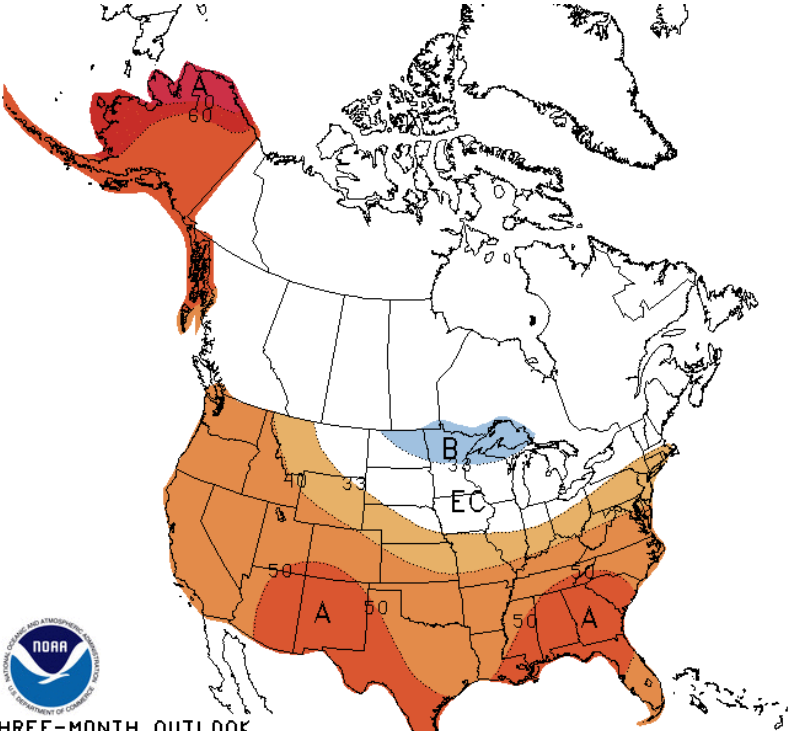
# TEMPERATURE & PRECIPITATION NOVEMBER-DECEMBER-JANUARY OUTLOOK



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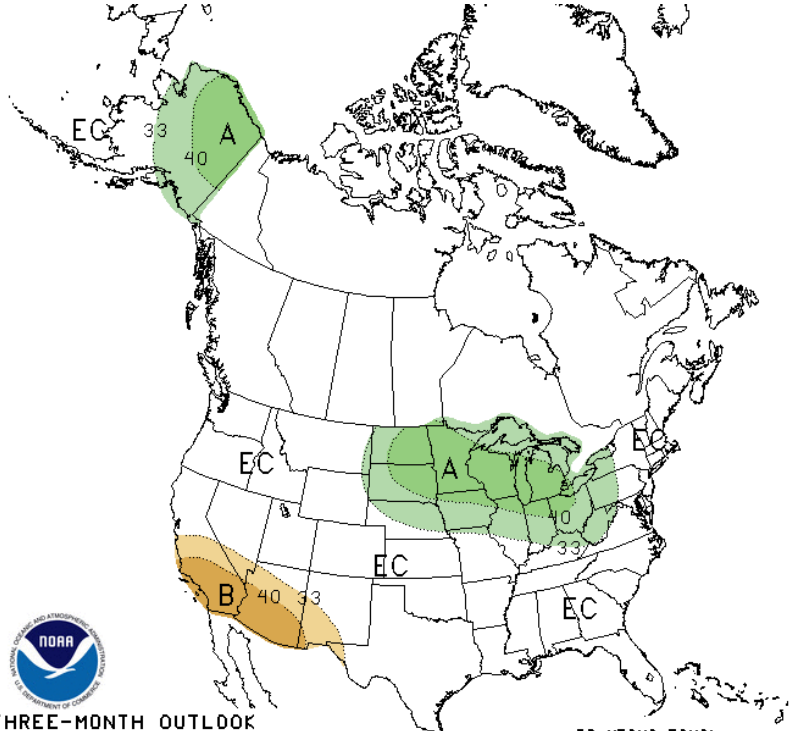
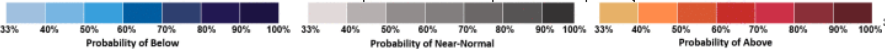


# SPRING OUTLOOK



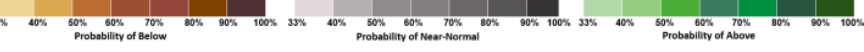
THREE-MONTH OUTLOOK  
TEMPERATURE PROBABILITY  
4.5 MONTH LEAD  
VALID MAM 2020  
MADE 17 OCT 2019

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



THREE-MONTH OUTLOOK  
PRECIPITATION PROBABILITY  
4.5 MONTH LEAD  
VALID MAM 2020  
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EC MEANS EQUAL CHANCES FOR A, N, B  
A MEANS ABOVE  
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# WATER MANAGEMENT OBJECTIVE

Safely release all flood control storage before ice-over at the reservoirs

- Median ice-over date – 25-NOV

October 16 – forecasts indicated a combined release of 2,400 cfs would achieve this goal

Inflow forecasts have increased significantly, no longer possible to hit November 25 target date with current releases



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# REGULATION OPTIONS

1. Increase releases to evacuate all flood storage before winter
  - November 25 target (median ice-in date at Pipestem)
2. Maintain releases & make a winter release to evacuate all flood storage before spring (March 1 target)
3. Increase releases & make a winter release to evacuate all flood storage before spring (March 1 target)
- ~~4. Store flood water until spring~~



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# WINTER FLOOD CONTROL STORAGE

Simulations with 2,400 cfs to determine pool elevations and amount of flood control storage occupied on March 1:

- Jamestown                    1443.8 ft            39.4%
- Pipestem                    1469.8 ft            32.6%

Only 3 inches of snow water equivalent would be necessary to fill remaining flood control storage

2014: ~ **3" SWE**

2017: ~ **4.25" SWE**

2015: ~ 2.5" SWE

2018: ~ **3.5" SWE**

2016: ~ 1.5" SWE

2019: ~ **4.25" SWE**

Winter Conditions seen in 2009 (6+” SWE) and 2011 (5+” SWE) would have resulted in significant spillway flow



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Empty Flood Storage by November 25

## REGULATION OPTION #1

- Total Combined Release
- Total Winter Release
- Empty Flood Storage Date

**4,400 cfs**

N/A

Jamestown    early Dec

Pipestem    early Dec

## IMPACTS

- Advanced measures would be required in Jamestown & LaMoure, likely in downstream communities
- Construction would destroy land
- Bridge overtopping
- Road access
- Increased agricultural flooding
- No flexibility to cut back releases
- Bank erosion from quick ramp down

## RISKS

- Combined releases exceed previous record
- Difficult to build advance measures
- May not have room to construct the amount of advanced measures needed
- Uncertainty in scope of advanced measures
- Still may not evacuate flood storage before winter if additional precipitation or early winter
- Higher than expected local runoff
- Need to cut back releases before winter to avoid levee failures during ice-in



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## REGULATION OPTION #2

Increase Releases now  
Winter Releases

- Total Combined Release **3,200 cfs**
- Total Winter Release ~400 cfs
- Empty Flood Storage Date  
Jamestown late Feb  
Pipestem mid-Jan

## IMPACTS

- Advanced measures would be required in Jamestown & LaMoure, likely in downstream communities
- Construction would destroy land
- Bridge overtopping
- Road access
- Increased agricultural flooding
- Bank erosion from quick ramp down
- Dam embankment damage due to sloughing & ice

## RISKS

- Difficult to build advance measures
- Higher than expected local runoff
- Need to cut back releases before winter to avoid levee failures during ice-in
- Outlet works damage due to ice at Pipestem
- Inoperable gates at Pipestem Dam due to ice
- Ice-related flooding
- Lower-than-expected winter channel capacity  
→ inability to evacuate flood storage before spring



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# REGULATION OPTION #3

Maintain Current Releases  
Winter Releases

- Total Combined Release **2,400 cfs**
- Total Winter Release ~800 cfs
- Empty Flood Storage Date  
Jamestown late Feb  
Pipestem late Feb

## IMPACTS

- No additional construction of advanced measures
- Local advanced measures in Jamestown & LaMoure
- Dam embankment damage due to sloughing & ice

## RISKS

- Higher than expected local runoff
- Outlet works damage due to ice at Pipestem
- Inoperable gates at Pipestem Dam due to ice
- Ice-related flooding
- Lower-than-expected winter channel capacity  
→ inability to evacuate flood storage before spring



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# CORPS REGULATION DECISION

Regulation Option #3: Maintain current releases & make a winter release to empty flood storage before spring

- Cut back releases to expected iced-in channel capacities before ice formation
- Cut back releases by 40% for stable ice cover formation
- Slowly ramp up to a constant release to target evacuation by spring
  
- Downstream channel monitoring, especially during ice formation
- Additional SWE measurements to better prepare for spring runoff

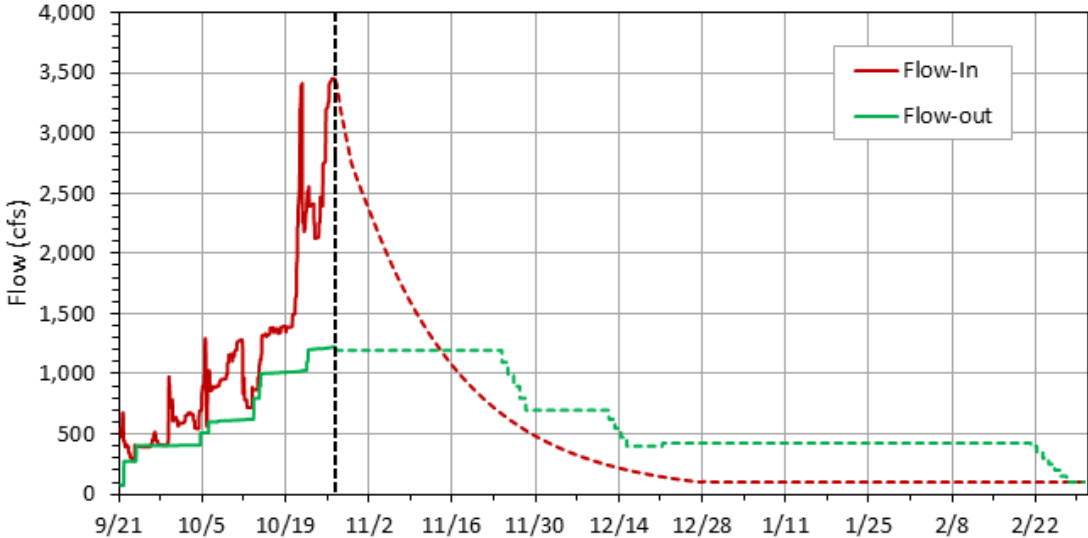
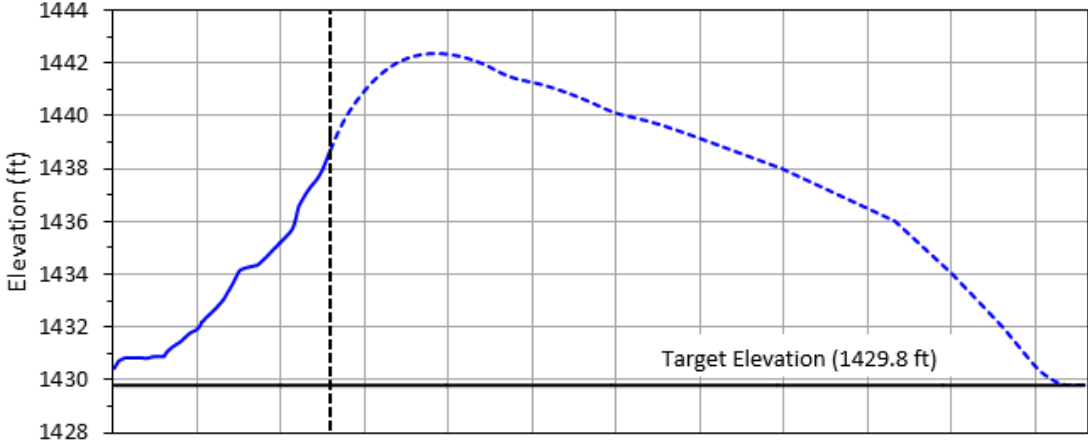


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# UPDATED RESERVOIR FORECASTS

Jamestown Reservoir





# UPDATED RESERVOIR FORECASTS

Pipestem Reservoir

