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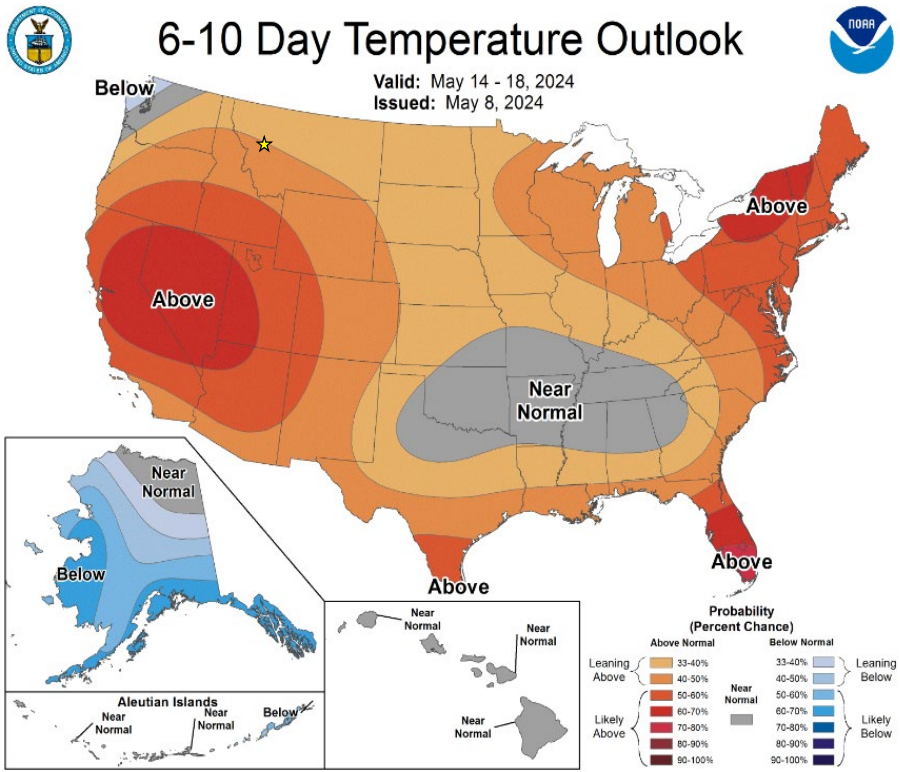
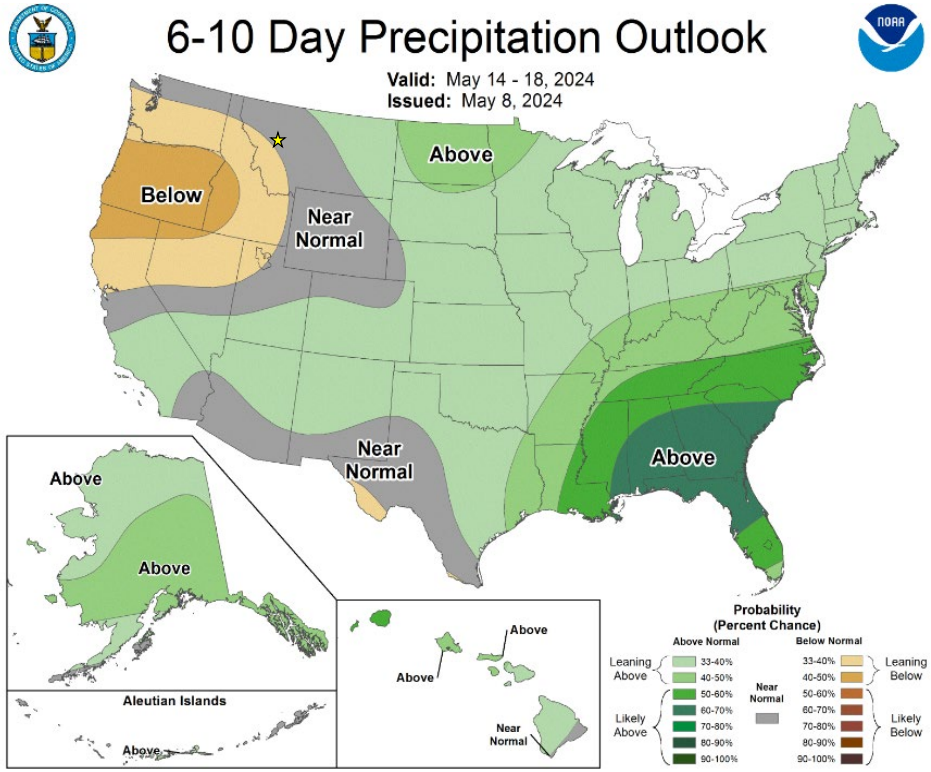
# 2024 Water Supply Outlook (05/09/24)

| Approximate date | Purpose of Meeting |
|---|---|
| End of January | Review reservoir carryover and initial projection of water supply, tentatively categorize water-year type |
| End of February | Review reservoir carryover and initial projection of water supply, tentatively categorize water-year type, set March wet and normal year streamflow targets, modify MEF timing (if applicable) to match anticipated snowmelt runoff |
| End of March | Refine projection of water supply, tentatively categorize water-year type, and set April wet and normal streamflow targets, modify MEF timing (if applicable) to match anticipated snowmelt runoff |
| Mid-April | Refine projection of water supply, categorize water-year type, update wet and normal streamflow targets for the month, set initial RDAs based on water year type, modify MEF timing (if applicable) to match anticipated snowmelt runoff |
| Early May | Refine projection of water supply, update water-year type (if applicable), set wet and normal streamflow targets for the month, review initial RDAs based on water year type, taking into account any changes in water year type, modify MEF timing (if applicable) to match anticipated snowmelt runoff |
| Mid-May | Refine projection of water supply, update water-year type, update wet and normal streamflow targets for the month, update RDAs based on any changes in water year type, modify MEF timing (if applicable) to match anticipated snowmelt runoff |
| Early June | Refine projection of water supply, update water-year type (if applicable), set wet and normal streamflow targets for month, quantify portion of RDAs used to date, modify MEF timing (if applicable) to match anticipated snowmelt runoff |
| Mid June | Finalize projection of water supply and water-year type, update wet and normal streamflow targets for month, modify RDAs based on any changes in water year type, modify MEF timing (if applicable) to match anticipated snowmelt runoff |
| Early July | Set wet and normal streamflow targets for the month, evaluate RDAs, quantify portion of RDAs used to date |
| Mid July | Update wet and normal streamflow targets for the month |
| Early August | Set wet and normal streamflow targets for the month, evaluate RDAs, quantify portion of RDAs used to date |
| Early September | Set wet and normal streamflow targets for the month, quantify portion of RDAs used to date |
| Early October | Discuss annual reporting and water operations for the completed irrigation season, develop long-range forecast based on climatic indicators |
| Early December | Finalize annual reporting of water measurement, refine long-range forecast based on climatic indicators |

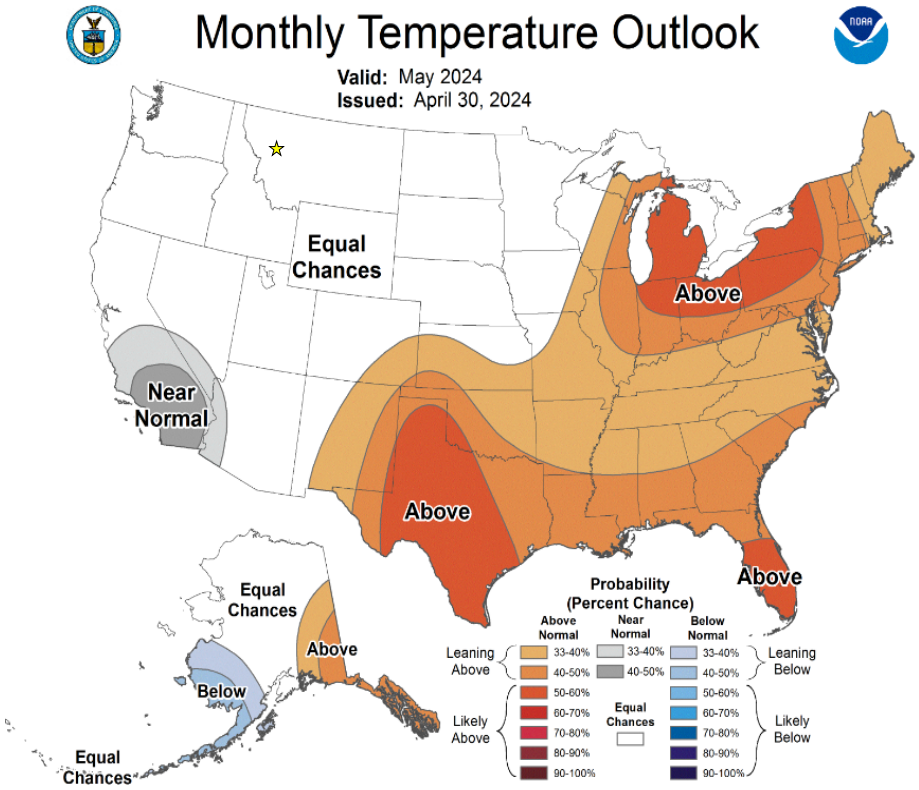
# Appendix 3.5 Timeline

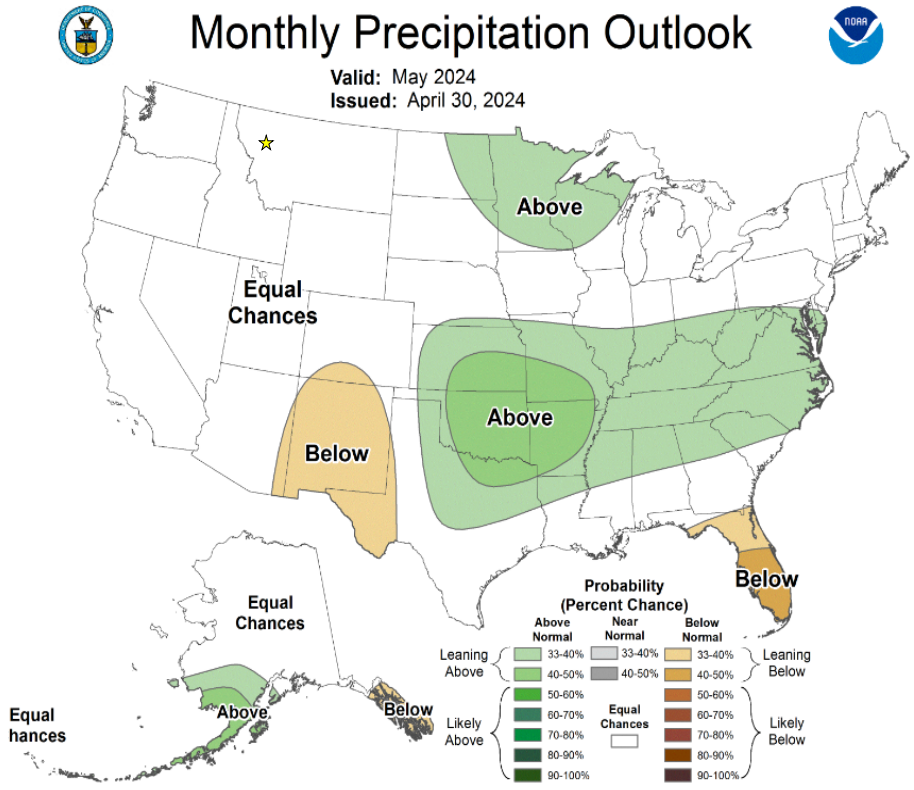
# 6-10 Day Outlook – Issued May 8, 2024



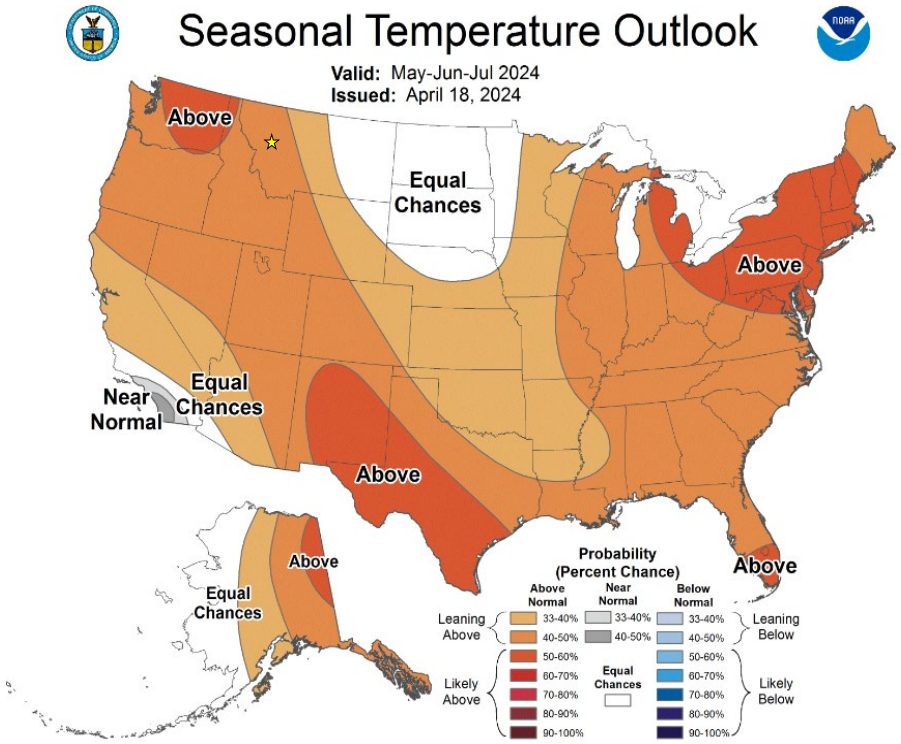



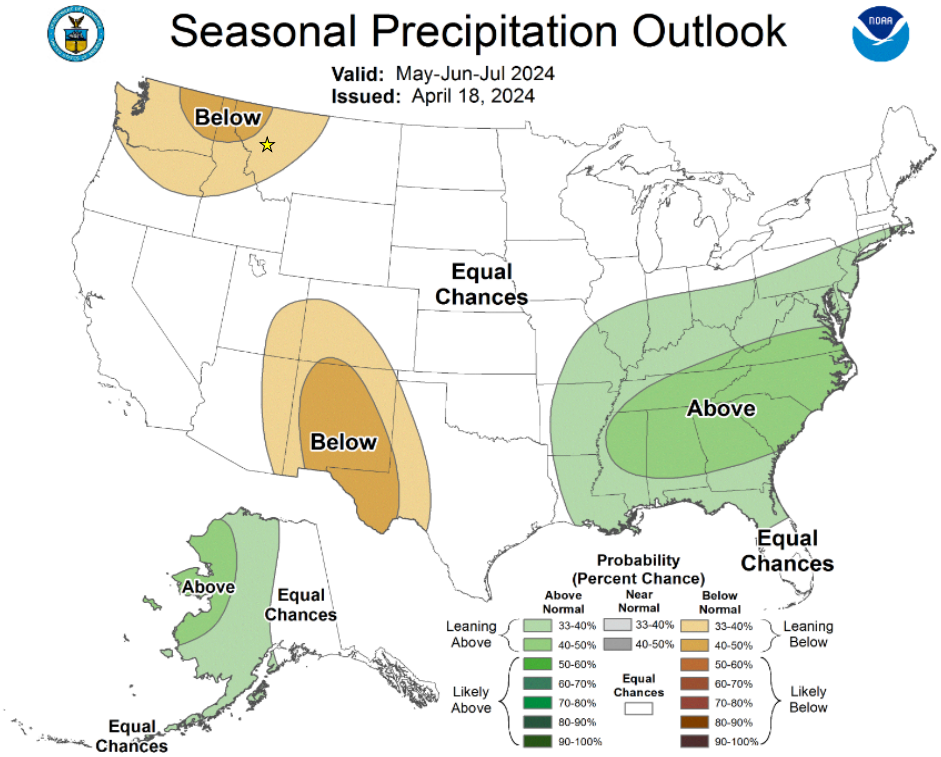
# Monthly Outlooks – May 2024

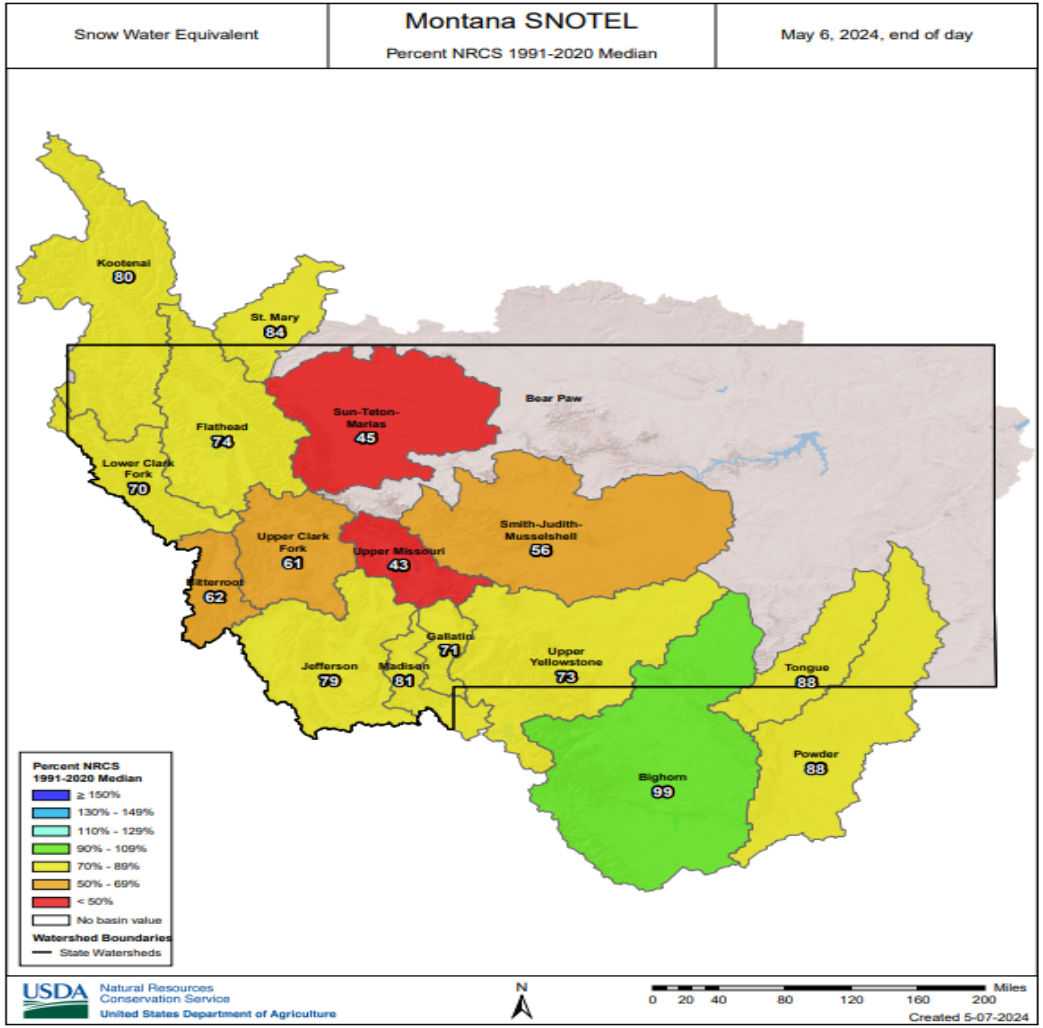


# 3 Month Outlooks – May-June-July 2024





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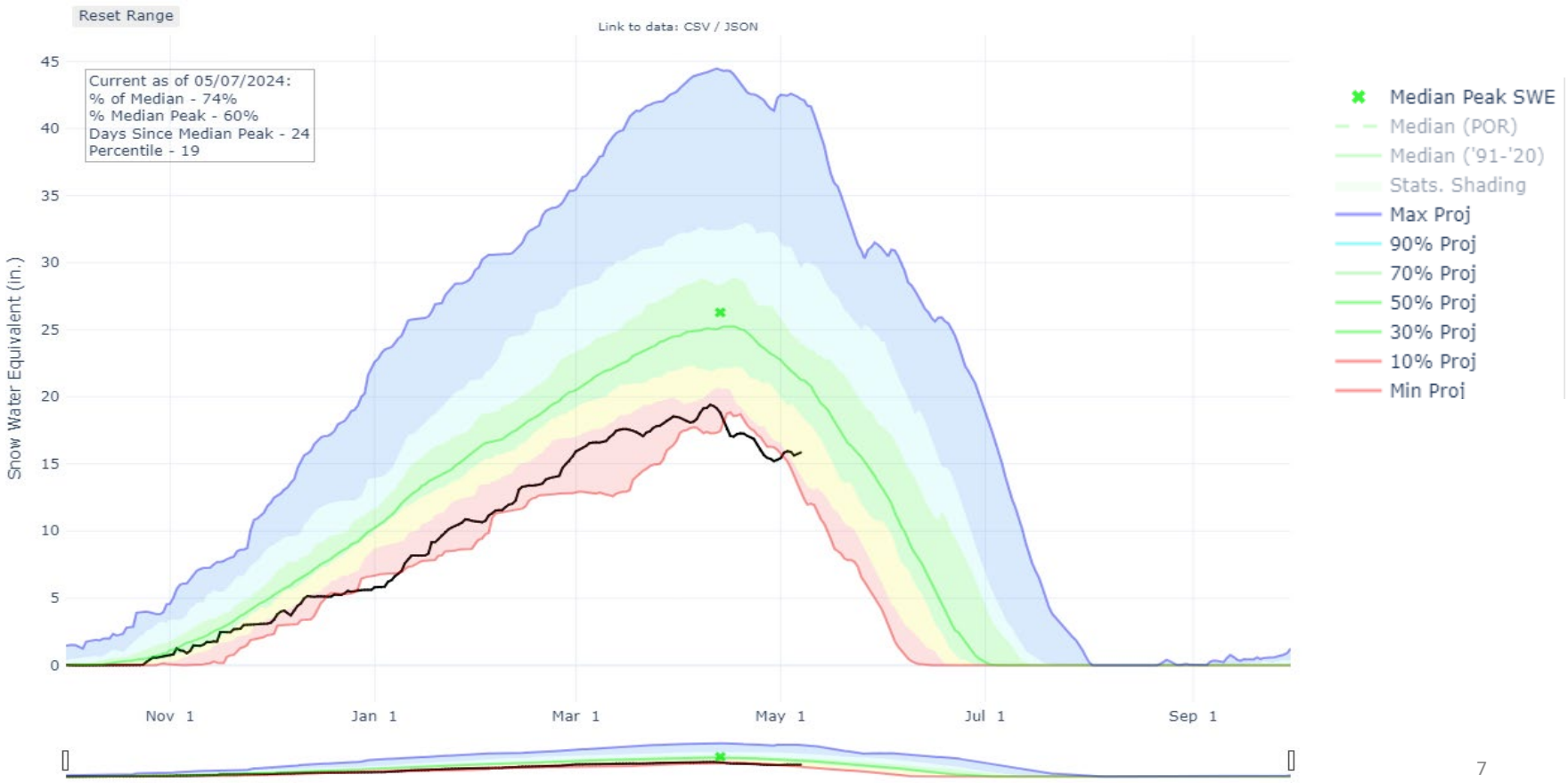
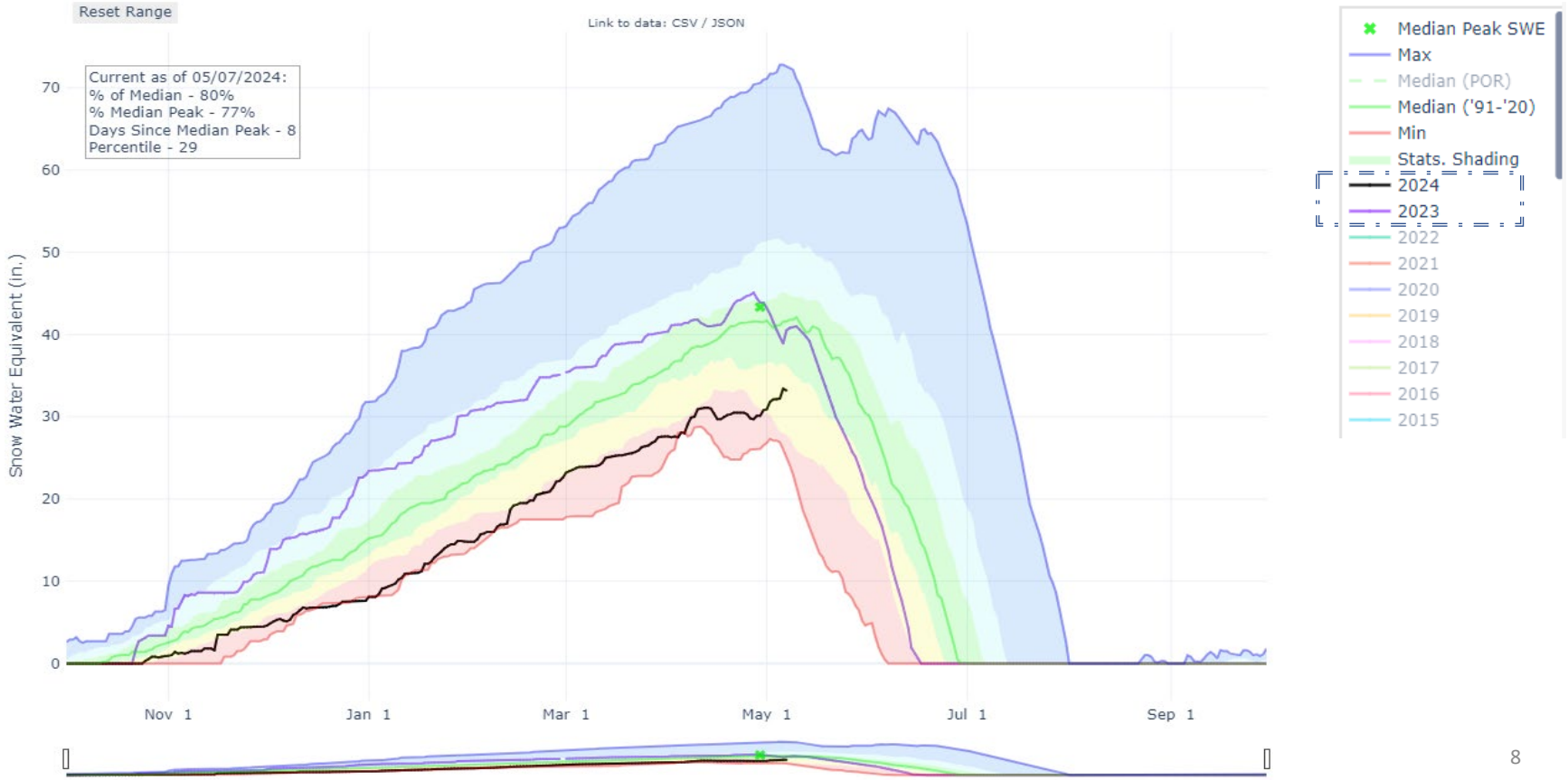
# AWS Plot | SNOW WATER EQUIVALENT PROJECTION IN FLATHEAD



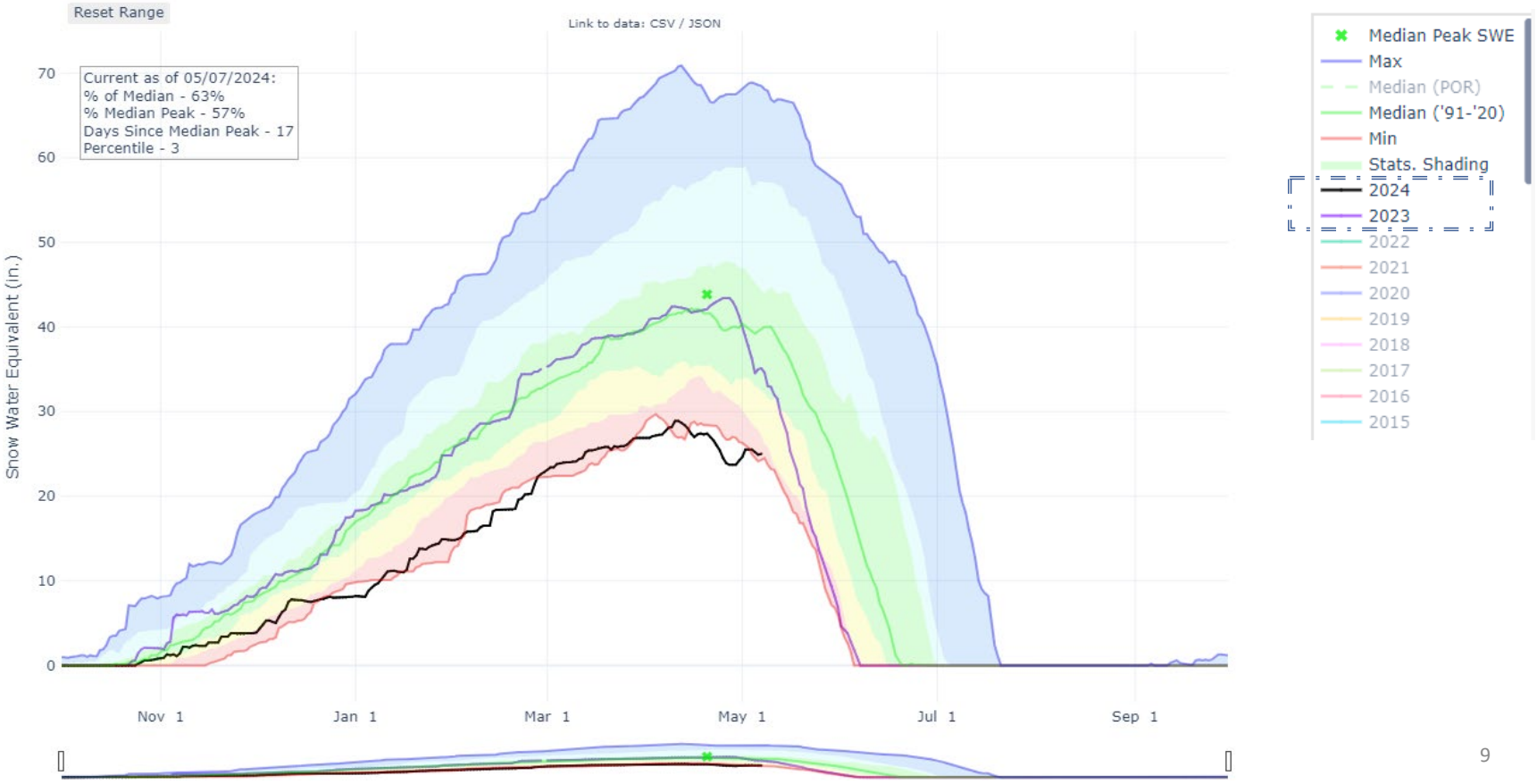
DRAFT – Not Approved by CITT

# AWS Plot | MOSS PEAK, MT (646) SNOW WATER EQUIVALENT



DRAFT – Not Approved by CITT

# AWS Plot | NORTH FORK JOCKO, MT (667) SNOW WATER EQUIVALENT



# Forecasting – NRCS Basin Reports

Report Created:
5/7/2024 5:33:42 AM

**Streamflow Forecast Summary: May 1, 2024**
**(Medians based On 1991-2020 reference period)**

| Flathead | Forecast Period | Forecast Exceedance Probabilities For Risk Assessment: Chance that actual volume will exceed forecast — 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Median (KAF) |
|---|---|---|---|---|---|---|---|---|
| NF Flathead R nr Columbia Falls | | | | | | | | |
| | MAY-JUL | 890 | 970 | 1030 | 74% | 1110 | 1210 | 1390 |
| | MAY-SEP | 1030 | 1140 | 1220 | 79% | 1310 | 1440 | 1540 |
| Swan R nr Bigfork | | | | | | | | |
| | MAY-JUL | 260 | 290 | 310 | 71% | 335 | 375 | 435 |
| | MAY-SEP | 305 | 340 | 365 | 72% | 395 | 440 | 505 |
| Flathead R at Columbia Falls[2] | | | | | | | | |
| | MAY-JUL | 2610 | 2900 | 3100 | 71% | 3350 | 3740 | 4370 |
| | MAY-SEP | 2900 | 3260 | 3500 | 71% | 3780 | 4140 | 4900 |
| Flathead Lake Inflow[1,2] | | | | | | | | |
| | MAY-JUL | 2460 | 3180 | 3510 | 70% | 3840 | 4560 | 5040 |
| | MAY-SEP | 2770 | 3620 | 4010 | 71% | 4400 | 5250 | 5680 |
| Mission Ck nr St. Ignatius | | | | | | | | |
| | MAY-JUL | 16.5 | 17.9 | 20 | 80% | 23 | 28 | 25 |
| | MAY-SEP | 19.8 | 20 | 24 | 80% | 27 | 33 | 30 |
| MF Flathead R nr West Glacier | | | | | | | | |
| | MAY-JUL | 820 | 910 | 980 | 75% | 1060 | 1170 | 1310 |
| | MAY-SEP | 945 | 1050 | 1120 | 76% | 1210 | 1350 | 1470 |
| SF Jocko R nr Arlee | | | | | | | | |
| | MAY-JUL | 15.4 | 17.8 | 19.8 | 60% | 22 | 28 | 33 |
| | MAY-SEP | 18.1 | 21 | 23 | 62% | 26 | 32 | 37 |
| Hellroaring Creek ab Reservoir nr Polson | | | | | | | | |
| | MAY-JUL | 2.1 | 2.5 | 2.7 | 75% | 3 | 3.5 | 3.6 |
| | MAY-SEP | 3 | 3.4 | 3.7 | 80% | 4 | 4.6 | 4.6 |
| South Crow Ck nr Ronan | | | | | | | | |
| | MAY-JUL | 5.4 | 6.2 | 7.6 | 78% | 8.1 | 10.4 | 9.7 |
| | MAY-SEP | 6.2 | 7 | 8.6 | 79% | 9.7 | 11.8 | 10.9 |
| Mill Ck ab Bassoo ck nr Niarada | | | | | | | | |
| | MAY-JUL | 0.96 | 1.45 | 1.73 | 54% | 2.1 | 2.8 | 3.2 |
| | MAY-SEP | 1.34 | 1.78 | 2 | 56% | 2.4 | 2.9 | 3.6 |
| Sf Flathead R nr Hungry Horse | | | | | | | | |
| | MAY-JUL | 640 | 690 | 740 | 74% | 785 | 860 | 1000 |
| | MAY-SEP | 675 | 735 | 795 | 74% | 845 | 925 | 1070 |
| Hungry Horse Reservoir Inflow[1,2] | | | | | | | | |
| | MAY-JUL | 795 | 1000 | 1100 | 72% | 1200 | 1410 | 1530 |
| | MAY-SEP | 885 | 1120 | 1230 | 74% | 1340 | 1580 | 1660 |

1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

# Forecasting – NRCS Basin Reports

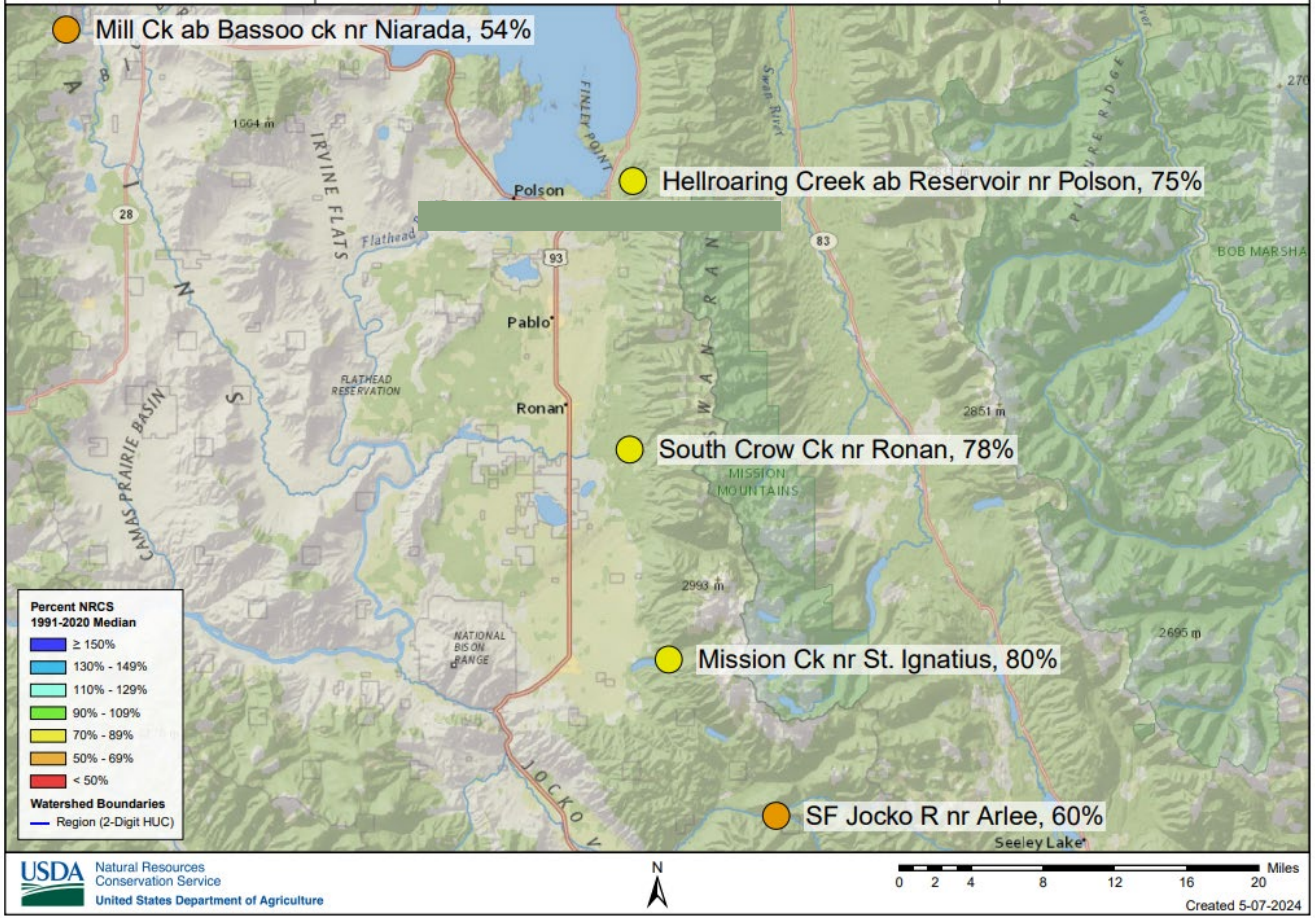
Report Created:
5/7/2024 5:33:42 AM

**Streamflow Forecast Summary: May 1, 2024**
**(Medians based On 1991-2020 reference period)**

| Flathead | Forecast Period | Forecast Exceedance Probabilities For Risk Assessment: Chance that actual volume will exceed forecast — 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Median (KAF) |
|---|---|---|---|---|---|---|---|---|
| NF Flathead R nr Columbia Falls | | | | | | | | |
| | MAY-JUL | 890 | 970 | 1030 | 74% | 1110 | 1210 | 1390 |
| | MAY-SEP | 1030 | 1140 | 1220 | 79% | 1310 | 1440 | 1540 |
| Swan R nr Bigfork | | | | | | | | |
| | MAY-JUL | 260 | 290 | 310 | 71% | 335 | 375 | 435 |
| | MAY-SEP | 305 | 340 | 365 | 72% | 395 | 440 | 505 |
| Flathead R at Columbia Falls[2] | | | | | | | | |
| | MAY-JUL | 2610 | 2900 | 3100 | 71% | 3350 | 3740 | 4370 |
| | MAY-SEP | 2900 | 3260 | 3500 | 71% | 3780 | 4140 | 4900 |
| Flathead Lake Inflow[1,2] | | | | | | | | |
| | MAY-JUL | 2460 | 3180 | 3510 | 70% | 3840 | 4560 | 5040 |
| | MAY-SEP | 2770 | 3620 | 4010 | 71% | 4400 | 5250 | 5680 |
| Mission Ck nr St. Ignatius | | | | | | | | |
| | MAY-JUL | 16.5 | 17.9 | 20 | 80% | 23 | 28 | 25 |
| | MAY-SEP | 19.8 | 20 | 24 | 80% | 27 | 33 | 30 |
| MF Flathead R nr West Glacier | | | | | | | | |
| | MAY-JUL | 820 | 910 | 980 | 75% | 1060 | 1170 | 1310 |
| | MAY-SEP | 945 | 1050 | 1120 | 76% | 1210 | 1350 | 1470 |
| SF Jocko R nr Arlee | | | | | | | | |
| | MAY-JUL | 15.4 | 17.8 | 19.8 | 60% | 22 | 28 | 33 |
| | MAY-SEP | 18.1 | 21 | 23 | 62% | 26 | 32 | 37 |
| Hellroaring Creek ab Reservoir nr Polson | | | | | | | | |
| | MAY-JUL | 2.1 | 2.5 | 2.7 | 75% | 3 | 3.5 | 3.6 |
| | MAY-SEP | 3 | 3.4 | 3.7 | 80% | 4 | 4.6 | 4.6 |
| South Crow Ck nr Ronan | | | | | | | | |
| | MAY-JUL | 5.4 | 6.2 | 7.6 | 78% | 8.1 | 10.4 | 9.7 |
| | MAY-SEP | 6.2 | 7 | 8.6 | 79% | 9.7 | 11.8 | 10.9 |
| Mill Ck ab Bassoo ck nr Niarada | | | | | | | | |
| | MAY-JUL | 0.96 | 1.45 | 1.73 | 54% | 2.1 | 2.8 | 3.2 |
| | MAY-SEP | 1.34 | 1.78 | 2 | 56% | 2.4 | 2.9 | 3.6 |
| Sf Flathead R nr Hungry Horse | | | | | | | | |
| | MAY-JUL | 640 | 690 | 740 | 74% | 785 | 860 | 1000 |
| | MAY-SEP | 675 | 735 | 795 | 74% | 845 | 925 | 1070 |
| Hungry Horse Reservoir Inflow[1,2] | | | | | | | | |
| | MAY-JUL | 795 | 1000 | 1100 | 72% | 1200 | 1410 | 1530 |
| | MAY-SEP | 885 | 1120 | 1230 | 74% | 1340 | 1580 | 1660 |

1) 90% And 10% exceedance probabilities are actually 95% And 5%
2) Forecasts are For unimpaired flows. Actual flow will be dependent On management of upstream reservoirs And diversions

| Forecast Volume, 50% Exceedance Probability | Percent NRCS 1991-2020 Median | Primary Period, May 1, 2024 |
|---|---|---|



# Utilizing May-July forecasts within the context of Appendix 3.7 values (April-July)

Table 1: May 2024 Water Year and NRCS Streamflow Forecast

| | | May NRCS Streamflow Forecast, May - July 2024 | | | | Site-Specific Water Year Thresholds | | |
|---|---|---|---|---|---|---|---|---|
| Geographic Area | Gage Site | 70% | 50% | 30% | % Median | Dry Year | Normal Year | Wet Year |
| Jocko | South Fork Jocko near Arlee | 17,800 | 19,800 | 22,000 | 60% | <24,000 | 24,000 - 36,000 | >36,000 |
| Mission | Mission Creek near St. Ignatius | 17,900 | 20,000 | 23,000 | 80% | <21,100 | 21,100 - 29,000 | >29,000 |
| | South Crow Creek near Ronan | 6,200 | 7,600 | 8,100 | 78% | <7,700 | 7,700 - 11,800 | >11,800 |
| | Hellroaring Creek | 2,500 | 2,700 | 3,000 | 75% | <3,350 | 3,350-4,750 | >4,750 |
| Little Bitterroot | Mill Creek above Bassoo Creek near Niarada | 1,450 | 1,730 | 2,100 | 54% | <2,200 | 2,200 - 4,900 | >4,900 |

| |
|---|
| Wet |
| Normal |
| Dry |

*all values are in acre feet

# Observed (Measured) April Flows

Calculated as Mean Daily Discharges converted to Acre Feet Volumes

| 3521 South Crow | | 0600 Hellroaring | | USGS S. Fork Jocko | | 3121 Mill Creek | |
|---|---|---|---|---|---|---|---|
| Date | Mean Q (cfs) | Date | Mean Q (cfs) | Date | Mean Q (cfs) | Date | Mean Q (cfs) |
| 4/1/2024 | 8.4 | 4/1/2024 | 9.7 | 4/1/2024 | 18.7 | 4/1/2024 | 3.7 |
| 4/2/2024 | 8.4 | 4/2/2024 | 9.9 | 4/2/2024 | 20.2 | 4/2/2024 | 3.8 |
| 4/3/2024 | 9.0 | 4/3/2024 | 11.1 | 4/3/2024 | 26.8 | 4/3/2024 | 4.5 |
| 4/4/2024 | 13.3 | 4/4/2024 | 11.7 | 4/4/2024 | 36.5 | 4/4/2024 | 5.6 |
| 4/5/2024 | 15.9 | 4/5/2024 | 13.3 | 4/5/2024 | 48.7 | 4/5/2024 | 7.5 |
| 4/6/2024 | 15.7 | 4/6/2024 | 13.1 | 4/6/2024 | 48.3 | 4/6/2024 | 8.3 |
| 4/7/2024 | 14.0 | 4/7/2024 | 12.0 | 4/7/2024 | 44.9 | 4/7/2024 | 7.4 |
| 4/8/2024 | 13.0 | 4/8/2024 | 10.7 | 4/8/2024 | 41.9 | 4/8/2024 | 6.9 |
| 4/9/2024 | 12.6 | 4/9/2024 | 9.8 | 4/9/2024 | 44.8 | 4/9/2024 | 6.7 |
| 4/10/2024 | 12.6 | 4/10/2024 | 9.0 | 4/10/2024 | 45.7 | 4/10/2024 | 6.8 |
| 4/11/2024 | 12.8 | 4/11/2024 | 9.2 | 4/11/2024 | 50.1 | 4/11/2024 | 6.8 |
| 4/12/2024 | 13.7 | 4/12/2024 | 9.8 | 4/12/2024 | 60.7 | 4/12/2024 | 7.0 |
| 4/13/2024 | 18.4 | 4/13/2024 | 11.9 | 4/13/2024 | 87.2 | 4/13/2024 | 7.7 |
| 4/14/2024 | 26.1 | 4/14/2024 | 15.2 | 4/14/2024 | 123.5 | 4/14/2024 | 8.9 |
| 4/15/2024 | 31.6 | 4/15/2024 | 16.9 | 4/15/2024 | 141.9 | 4/15/2024 | 11.3 |
| 4/16/2024 | 26.2 | 4/16/2024 | 16.5 | 4/16/2024 | 121.8 | 4/16/2024 | 14.6 |
| 4/17/2024 | 22.8 | 4/17/2024 | 14.4 | 4/17/2024 | 101.2 | 4/17/2024 | 16.5 |
| 4/18/2024 | 22.1 | 4/18/2024 | 12.4 | 4/18/2024 | 89.6 | 4/18/2024 | 15.8 |
| 4/19/2024 | 20.0 | 4/19/2024 | 11.1 | 4/19/2024 | 81.5 | 4/19/2024 | 14.4 |
| 4/20/2024 | 17.7 | 4/20/2024 | 9.9 | 4/20/2024 | 79.0 | 4/20/2024 | 13.5 |
| 4/21/2024 | 16.4 | 4/21/2024 | 9.5 | 4/21/2024 | 74.7 | 4/21/2024 | 12.4 |
| 4/22/2024 | 15.1 | 4/22/2024 | 9.0 | 4/22/2024 | 72.9 | 4/22/2024 | 11.2 |
| 4/23/2024 | 14.4 | 4/23/2024 | 8.7 | 4/23/2024 | 74.5 | 4/23/2024 | 10.3 |
| 4/24/2024 | 14.6 | 4/24/2024 | 8.7 | 4/24/2024 | 82.5 | 4/24/2024 | 9.5 |
| 4/25/2024 | 16.1 | 4/25/2024 | 9.0 | 4/25/2024 | 87.6 | 4/25/2024 | 9.0 |
| 4/26/2024 | 16.5 | 4/26/2024 | 9.2 | 4/26/2024 | 88.8 | 4/26/2024 | 9.6 |
| 4/27/2024 | 16.7 | 4/27/2024 | 10.0 | 4/27/2024 | 101.3 | 4/27/2024 | 10.2 |
| 4/28/2024 | 17.7 | 4/28/2024 | 10.8 | 4/28/2024 | 100.3 | 4/28/2024 | 11.2 |
| 4/29/2024 | 17.1 | 4/29/2024 | 10.3 | 4/29/2024 | 95.8 | 4/29/2024 | 12.3 |
| 4/30/2024 | 16.4 | 4/30/2024 | 9.9 | 4/30/2024 | 91.5 | 4/30/2024 | 13.5 |
| Acre Feet | 983 | Acre Feet | 661 | Acre Feet | 4331 | Acre Feet | 287 |

# May-July Forecasts + April Observed Flows to Project April-July Volumes

Table 1: May 2024 Water Year and NRCS Streamflow Forecast

| | | May NRCS Forecast - (May - July 2024 + April Measured Flows) | | | | Site-Specific Water Year Thresholds | | |
|---|---|---|---|---|---|---|---|---|
| Geographic Area | Gage Site | 70% | 50% | 30% | % Median | Dry Year | Normal Year | Wet Year |
| Jocko | South Fork Jocko near Arlee | 22,230 | 24,130 | 27,330 | 60% | <24,000 | 24,000 - 36,000 | >36,000 |
| Mission | Mission Creek near St. Ignatius** | 19,933 | 22,033 | 25,033 | 80% | <21,100 | 21,100 - 29,000 | >29,000 |
| | South Crow Creek near Ronan | 7,183 | 8,583 | 9,083 | 78% | <7,700 | 7,700 - 11,800 | >11,800 |
| | Hellroaring Creek | 3,161 | 3,361 | 3,661 | 75% | <3,350 | 3,350-4,750 | >4,750 |
| Little Bitterroot | Mill Creek above Bassoo Creek near Niarada | 1,737 | 2,017 | 2,387 | 54% | <2,200 | 2,200 - 4,900 | >4,900 |

| |
|---|
| Wet |
| Normal |
| Dry |

*all values are in acre feet

**Mission Cr. based on NRCS iMap

DRAFT – Not Approved by CITT

# 2024 Water Supply Outlook Summary (05/09/24)

°Flathead Basin-Wide (74% Median) indicates below average snowpack conditions as of 5/7/24.

°Outlooks do not signal a drastic improvement for temperature or precipitation.

°May-July streamflow forecasts, combined with observed April flows, indicate streamflow volumes that fit within the dry end of the normal-year category (50% exceedance probability) for South Fork Jocko, Mission Creek, South Crow Creek, and Hellroaring, while Mill Creek forecasts indicate a Dry year determination.

Table 1: May 2024 Water Year and NRCS Streamflow Forecast

| | | May NRCS Forecast - (May - July 2024 + April Measured Flows) | | | | Site-Specific Water Year Thresholds | | |
|---|---|---|---|---|---|---|---|---|
| Geographic Area | Gage Site | 70% | 50% | 30% | % Median | Dry Year | Normal Year | Wet Year |
| Jocko | South Fork Jocko near Arlee | 22,230 | 24,130 | 27,330 | 60% | <24,000 | 24,000 - 36,000 | >36,000 |
| Mission | Mission Creek near St. Ignatius** | 19,933 | 22,033 | 25,033 | 80% | <21,100 | 21,100 - 29,000 | >29,000 |
| | South Crow Creek near Ronan | 7,183 | 8,583 | 9,083 | 78% | <7,700 | 7,700 - 11,800 | >11,800 |
| | Hellroaring Creek | 3,161 | 3,361 | 3,661 | 75% | <3,350 | 3,350-4,750 | >4,750 |
| Little Bitterroot | Mill Creek above Bassoo Creek near Niarada | 1,737 | 2,017 | 2,387 | 54% | <2,200 | 2,200 - 4,900 | >4,900 |

| |
|---|
| Wet |
| Normal |
| Dry |

*all values are in acre feet

**Mission Cr. based on NRCS iMap