

# Montana

## Water Supply Outlook Report

### June 1<sup>st</sup>, 2015



*The Montana Snow Survey staff has been able to make the transition to maintaining the 131 SNOTEL sites in Montana, Wyoming and South Dakota with slightly easier access conditions than are typical for this time of the year. If you see us in the hills this summer come say hello! (Photo: Lucas Zukiewicz – Black Pine Ridge, outside of Phillipsburg, MT)*

Snowpack this month is well below normal for the date, the persistent weather pattern experienced from January until the beginning of May of abnormally warm and dry conditions caused low elevations to melt during March, and mid to upper elevations made the transition in April. The cooler and wet weather pattern east of the Continental Divide has prolonged some high elevation snowpack, while west of the Divide active melt continued through the month. Streamflow forecasts for the summer are well below average, and water users should consult individual basins for the current snowpack, precipitation and future streamflow conditions.

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## **Montana Water Supply Outlook Report as of June 1<sup>st</sup>, 2015**

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### ***How forecasts are made***

Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts. Streamflow forecasts are coordinated by Natural Resources Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

Snowpack data are obtained by using a combination of manual and automated SNOTEL measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via meteor burst telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

Forecast uncertainty originates from two sources: (1) uncertainty of future hydrologic and climatic conditions, and (2) error in the forecasting procedure. To express the uncertainty in the most probable forecast, four additional forecasts are provided. The actual streamflow can be expected to exceed the most probable forecast 50% of the time. Similarly, the actual streamflow volume can be expected to exceed the 90% forecast volume 90% of the time. The same is true for the 70%, 30%, and 10% forecasts. Generally, the 90% and 70% forecasts reflect drier than normal hydrologic and climatic conditions; the 30% and 10% forecasts reflect wetter than normal conditions. As the forecast season progresses, a greater portion of the future hydrologic and climatic uncertainty will become known and the additional forecasts will move closer to the most probable forecast.

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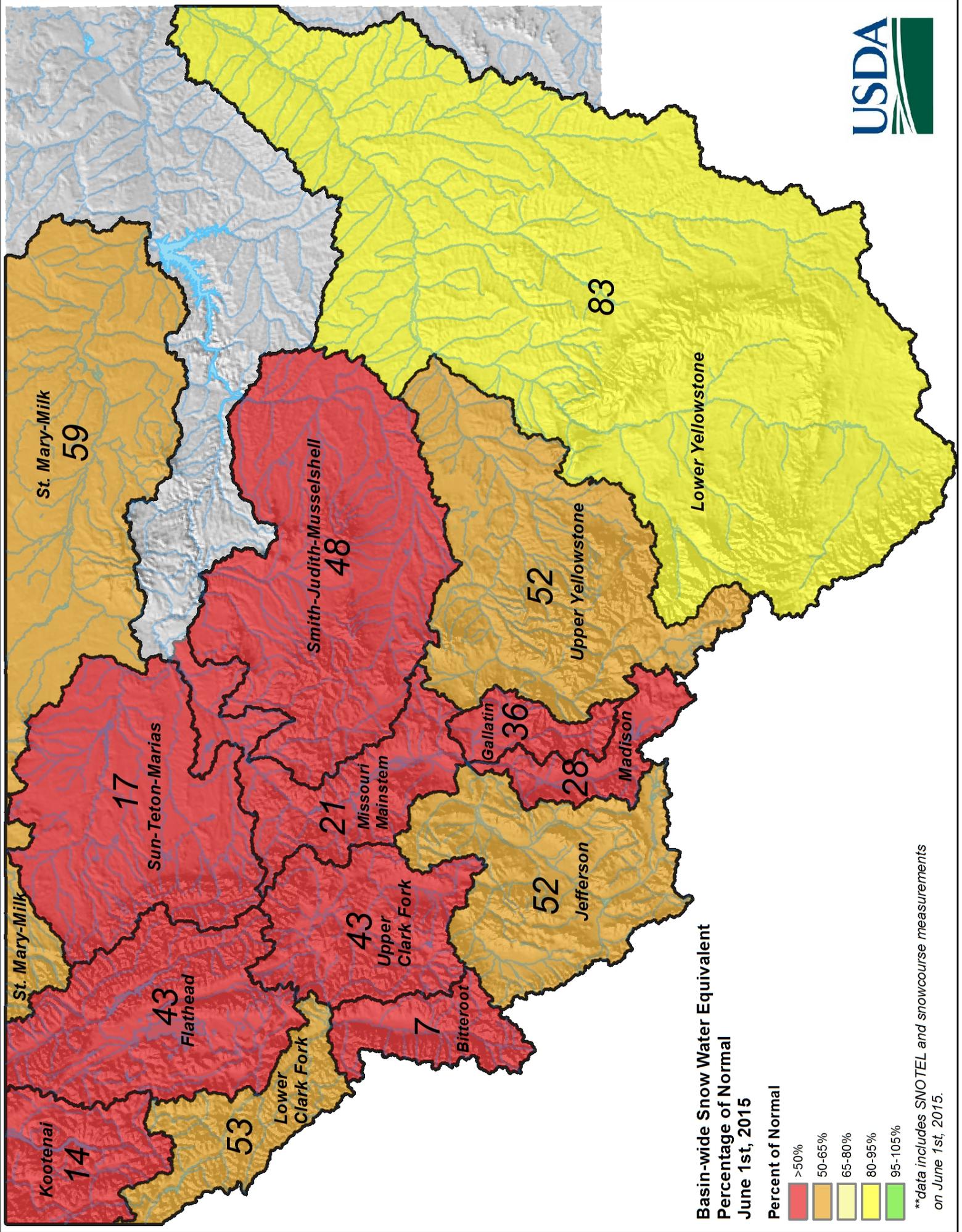
## Snowpack

Using the term “normal” to describe the snowpack seems a little inappropriate this water year considering this winter and spring were anything but normal. Snowpack across the state peaked between mid-March and mid-April depending on elevation and location within the state. The persistent weather pattern we experienced during March and April with well above average temperatures and well below normal precipitation finally gave way during the second week of May, but only east of the Divide and in the southern and central basins. Cooler and wet weather patterns slowed the melt of the remaining snowpack east of the Divide, with a few basins along the southern Montana border and Wyoming receiving up to 20” of snowfall in a late spring storms at higher elevations. Snowpack west of the Divide continued to decline through the month of May leaving all basins in this region well below normal on June 1<sup>st</sup>.

Data from SNOTEL and snowcourses shows that most basins have moved the bulk of their snow-water into the groundwater and surface water systems as of June 1<sup>st</sup>. 70 to 95 percent of the snowpack at SNOTEL and snowcourse elevations has melted by this point depending on the basin, decreasing the volume available off snow water available for runoff as we enter the more typical melt period. Higher elevations in some basins still have snowpack remaining to melt, but the major water yielding mid-elevations have made their big push for the year and will not drive future flows. 91 of the 131 (69%) of the SNOTEL sites have melted out at this time, and many of these melt out dates are the first or second earliest melt outs since automated records began.

Snowmelt is ahead of schedule in all basins this water year, and all basins are well below average for June 1<sup>st</sup>. State-wide snowpack is currently 42 percent of normal and 28 percent of last year at this time.

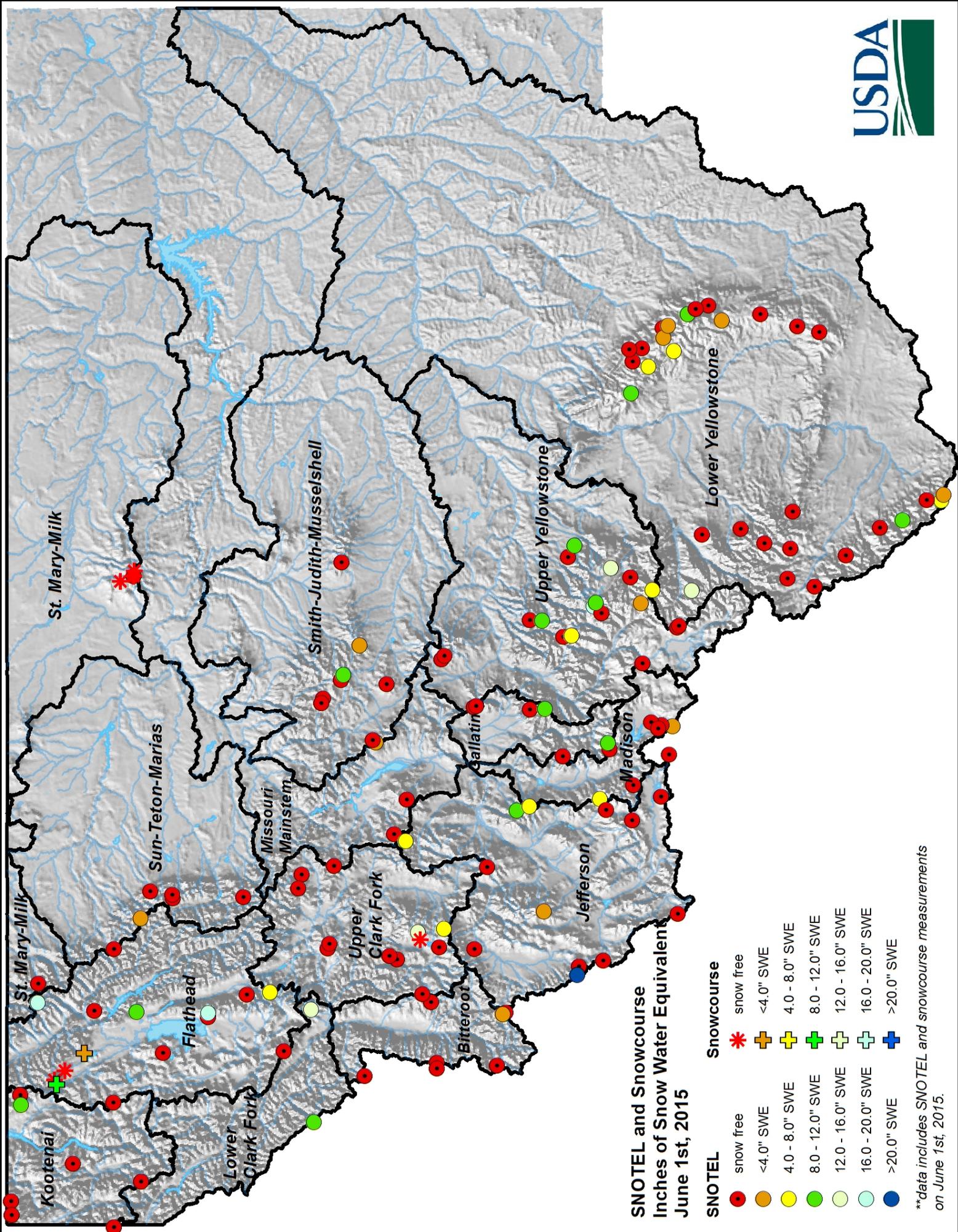
| <b><i>Snow Water Equivalent</i></b> |                 |                    |
|-------------------------------------|-----------------|--------------------|
| <b><i>6/1/2015</i></b>              | <b>% Normal</b> | <b>% Last Year</b> |
| <b>Columbia River Basin</b>         | <b>37%</b>      | <b>22%</b>         |
| Kootenai in Montana                 | 14%             | 8%                 |
| Flathead in Montana                 | 43%             | 27%                |
| Upper Clark Fork                    | 43%             | 27%                |
| Bitterroot                          | 7%              | 4%                 |
| Lower Clark Fork                    | 53%             | 23%                |
| <b>Missouri River Basin</b>         | <b>39%</b>      | <b>31%</b>         |
| Jefferson                           | 52%             | 42%                |
| Madison                             | 28%             | 26%                |
| Gallatin                            | 36%             | 27%                |
| Headwaters Mainstem                 | 21%             | 15%                |
| Smith-Judith-Musselshell            | 48%             | 41%                |
| Sun-Teton-Marias                    | 17%             | 9%                 |
| St. Mary-Milk                       | 59%             | 41%                |
| <b>Yellowstone River Basin</b>      | <b>67%</b>      | <b>46%</b>         |
| Upper Yellowstone                   | 52%             | 37%                |
| Lower Yellowstone                   | 83%             | 54%                |
|                                     |                 |                    |
| East of Divide                      | 55%             | 41%                |
| West of Divide                      | 37%             | 22%                |
| <b>Montana State-Wide</b>           | <b>42%</b>      | <b>28%</b>         |



**Basin-wide Snow Water Equivalent  
Percentage of Normal  
June 1st, 2015**

- Percent of Normal**
- >50%
  - 50-65%
  - 65-80%
  - 80-95%
  - 95-105%

\*\*data includes SNOTEL and snowcourse measurements on June 1st, 2015.



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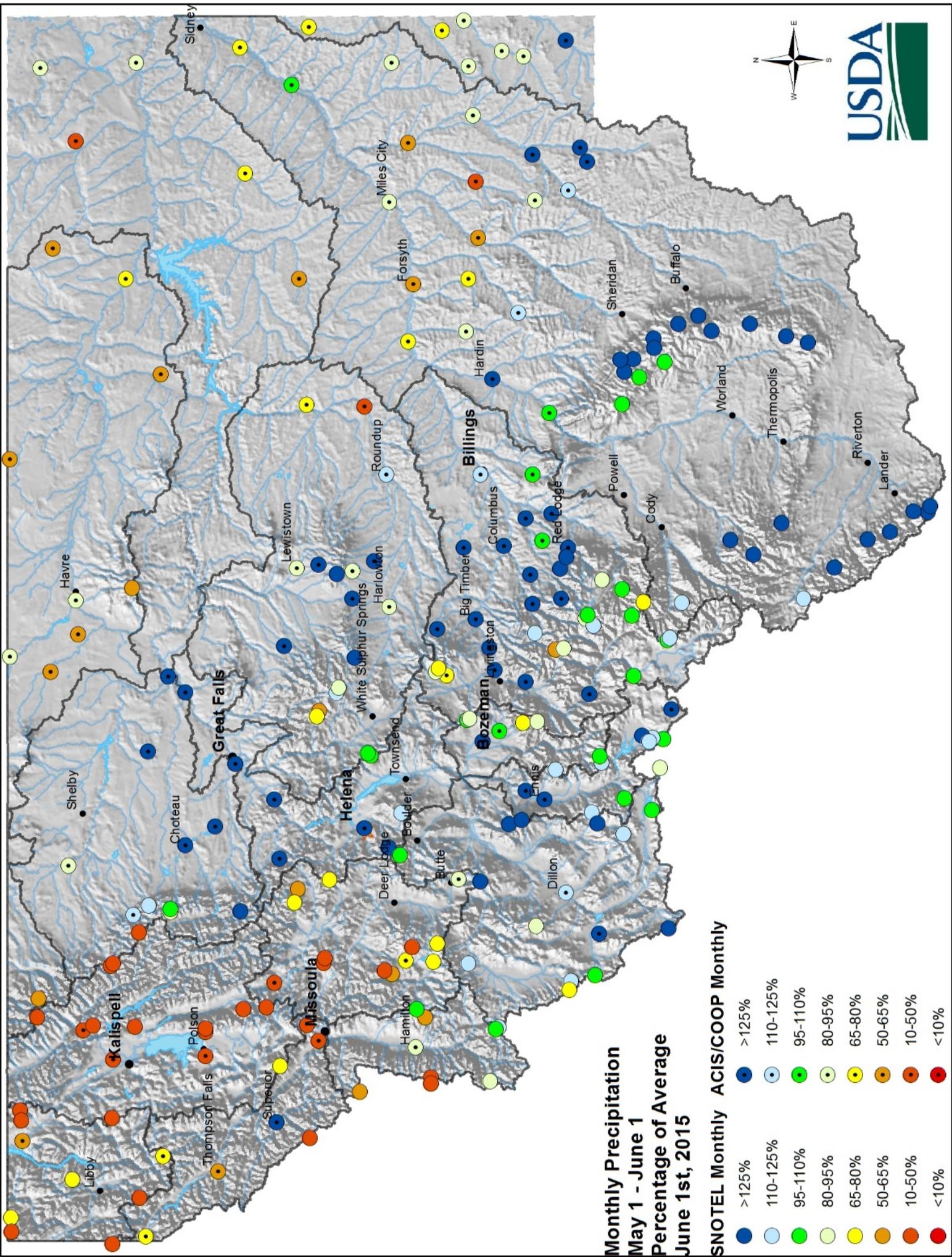
## Precipitation

The month of May favored basins east of the Divide in terms of precipitation where some improvements were made during the month in regards to water year-to-date precipitation. The southern and central basins east of the Divide were favored while northern basins near the Canadian border trended with the basins west of the Divide. East of the Divide monthly precipitation was 119 percent of average, raising the water year totals to 93 percent of average for June 1<sup>st</sup>. Historically April, May and June are favored east of the Divide so hopefully this trend continues.

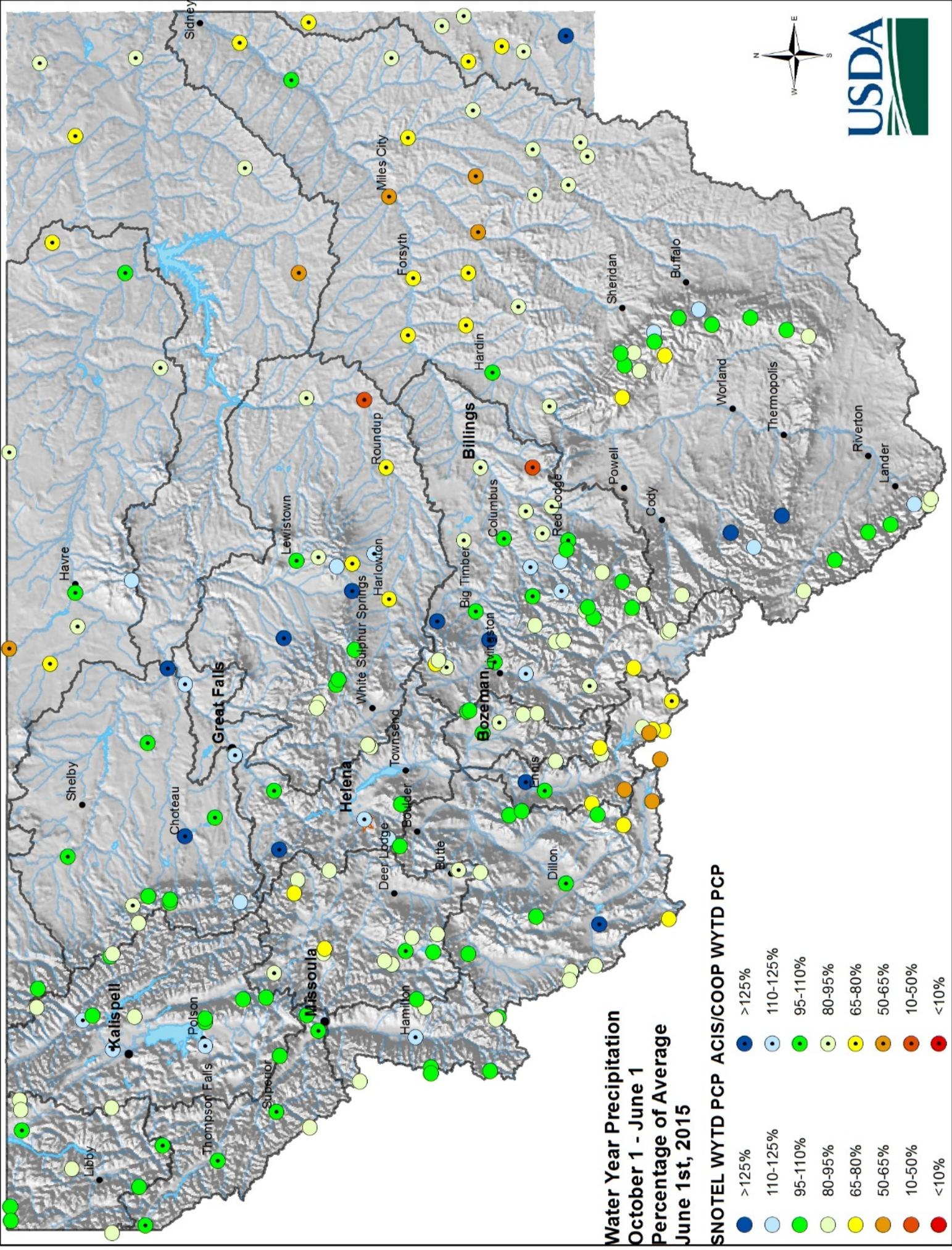
West of the Divide where snowpack was well below normal this winter and spring, basins received well below average precipitation during the month receiving only 32 to 66 percent. Overall, the basins west of the Divide received 53 percent of average precipitation for May. This region has seen below average precipitation for the last three months, and the below normal snowpack this winter combined with the below average spring precipitation resulted in below average streamflows during May.

State-wide monthly precipitation was 89 percent of average for the month of May, and is currently 93 percent of the water year-to-date average for June 1<sup>st</sup>. Due to the below normal snowpack this winter and spring and early melt of the snowpack, continued precipitation will be critical this summer as snowmelt contribution to streamflow will be below average.

| <b>Precipitation</b>           |               |                  |                |
|--------------------------------|---------------|------------------|----------------|
| <b>6/1/2015</b>                | Monthly % Avg | Water Year % Avg | WY % Last Year |
| <b>Columbia River Basin</b>    | <b>53%</b>    | <b>94%</b>       | <b>90%</b>     |
| Kootnenai in Montana           | 45%           | 93%              | 93%            |
| Flathead in Montana            | 32%           | 95%              | 89%            |
| Upper Clark Fork               | 65%           | 90%              | 86%            |
| Bitterroot                     | 66%           | 98%              | 84%            |
| Lower Clark Fork               | 62%           | 95%              | 93%            |
| <b>Missouri River Basin</b>    | <b>105%</b>   | <b>91%</b>       | <b>88%</b>     |
| Jefferson                      | 118%          | 88%              | 85%            |
| Madison                        | 127%          | 82%              | 76%            |
| Gallatin                       | 100%          | 92%              | 81%            |
| Headwaters Mainstem            | 108%          | 96%              | 86%            |
| Smith-Judith-Musselshell       | 107%          | 94%              | 89%            |
| Sun-Teton-Marias               | 89%           | 97%              | 96%            |
| St. Mary-Milk                  | 59%           | 97%              | 101%           |
| <b>Yellowstone River Basin</b> | <b>132%</b>   | <b>94%</b>       | <b>80%</b>     |
| Upper Yellowstone              | 118%          | 94%              | 77%            |
| Lower Yellowstone              | 141%          | 94%              | 82%            |
|                                |               |                  |                |
| East of Divide                 | 119%          | 93%              | 85%            |
| West of Divide                 | 53%           | 94%              | 90%            |
| <b>Montana State-Wide</b>      | <b>89%</b>    | <b>93%</b>       | <b>87%</b>     |



Map labels include: Sidney, Miles City, Forsyth, Sheridan, Buffalo, Worland, Thermopolis, Riverton, Lander, Roundup, Billings, Hardin, Powell, Cody, Red Lodge, Bozeman, Big Timber, Columbus, Deer Lodge, Townsend, Helena, Boulder, Butte, Dillon, Missoula, Hamilton, Kalispell, Polson, Thompson Falls, Superior, Libby, Havre, Shelby, Choteau, Great Falls, Lewis and Clark, and White Sulphur Springs.



This map displays the percentage of average precipitation for the water year from October 1st to June 1st, 2015, across Montana. The data is categorized into eight ranges, represented by different colors: dark blue (>125%), light blue (110-125%), green (95-110%), light green (80-95%), yellow (65-80%), orange (50-65%), red-orange (10-50%), and red (<10%).

Key counties and cities labeled on the map include: Kalispell, Libby, Thompson Falls, Superior, Missoula, Hamilton, Deer Lodge, Boulder, Butte, Dillon, Helena, Choteau, Shelby, Havre, Great Falls, Lewis and Clark, Roundup, White Sulphur Springs, Harlowton, Townsend, Big Timber, Bozeman, Livingston, Yellowstone, Big Horn, Red Lodge, Powell, Cody, Sheridan, Buffalo, Worland, Thermopolis, Riverton, Lander, Miles City, Forsyth, Hardin, and Sidney.

## Reservoirs

For today's date most reservoirs in the state are above average in terms of the average percent of capacity. That however does not mean that all reservoirs in the state are full. Snowmelt and summer precipitation usually provides water for inflows to the reservoirs, but this year the snowmelt component is ahead of schedule. The above normal percent of average storage for this date can be attributed to the early snow melt, and excellent carry over storage from last year when snowfall was more abundant.

The Smith-Judith-Musselshell, Gallatin and Madison River basins currently have reservoirs that are at full capacity on June 1<sup>st</sup>. The remaining reservoirs in the state will be reliant on the remaining snowpack at high elevation and summer precipitation to make future contributions.

Water demand on the reservoirs during the summer has an impact on in stream flows during the summer season, but also sets the stage for the next water year. If demand is high on the reservoirs this summer due to below normal precipitation they will have less carry over storage entering next spring. Conservative water use practices are always suggested as insurance in case snowpack is below normal next year as well.

State-wide reservoir storage is currently 113 percent of average for March 1<sup>st</sup>, and 112 percent of last year at this time.

| <b>Reservoir Storage</b>       |               |              |              |
|--------------------------------|---------------|--------------|--------------|
| <b>6/1/2015</b>                | Current % Avg | Pct Capacity | Current % LY |
| <b>Columbia River Basin</b>    | <b>112%</b>   | <b>82%</b>   | <b>112%</b>  |
| Kootnenai in Montana           | 117%          | 76%          | 116%         |
| Flathead in Montana            | 108%          | 88%          | 109%         |
| Upper Clark Fork               | 100%          | 85%          | 97%          |
| Bitterroot                     | 111%          | 109%         | 112%         |
| Lower Clark Fork               | 100%          | 97%          | 99%          |
| <b>Missouri River Basin</b>    | <b>114%</b>   | <b>81%</b>   | <b>112%</b>  |
| Jefferson                      | 93%           | 58%          | 113%         |
| Madison                        | 111%          | 99%          | 114%         |
| Gallatin                       | 118%          | 99%          | 128%         |
| Headwaters Mainstem            | 115%          | 74%          | 112%         |
| Smith-Judith-Musselshell       | 148%          | 104%         | 105%         |
| Sun-Teton-Marias               | 111%          | 70%          | 110%         |
| St. Mary-Milk                  | 128%          | 71%          | 125%         |
| <b>Yellowstone River Basin</b> | <b>115%</b>   | <b>72%</b>   | <b>124%</b>  |
| Upper Yellowstone              | 111%          | 68%          | 108%         |
| Lower Yellowstone              | 115%          | 72%          | 124%         |
|                                |               |              |              |
| East of Divide                 | 114%          | 81%          | 110%         |
| West of Divide                 | 112%          | 82%          | 112%         |
| <b>Montana State-Wide</b>      | <b>113%</b>   | <b>81%</b>   | <b>112%</b>  |

## Streamflow

Hopefully water users were prepared this spring, as much the state experienced an early start to this year's runoff. The low-mid elevation snow that typically primes Montana's rivers before peak runoff was melted due to the unseasonably warm temperatures and several rain events in March and April. This resulted in normal to well above normal streamflow conditions early this spring across Montana. The Kootenai River basin recorded new maximum daily flows at a handful of its gauging stations over the last week in March from substantial rain events. In contrast, the Beaverhead River basin has seen below to well below conditions most of this spring and due to lack of snow and will likely remain there this water year.

The early flush of the low-mid elevation snowpack through the system this spring set the stage for May-June flows this year. The majority of rivers west of the Divide experienced their snowmelt driven peaks around first week of May. With continued warm and dry weather east of the Divide rivers likely would have experienced their snowmelt driven peaks in late May, however many of these rivers are still on the rise due to substantial rainfall over the last 3 weeks. Much of this recent rain has driven higher elevation melt in the already lacking snowpack. Higher elevations snow typically sustain flows later in the summer, but this year are moving ahead of schedule similar to the lower elevations. Assuming normal precipitation conditions this summer streamflow will likely be below normal to well below average for the majority of the state later this water year.

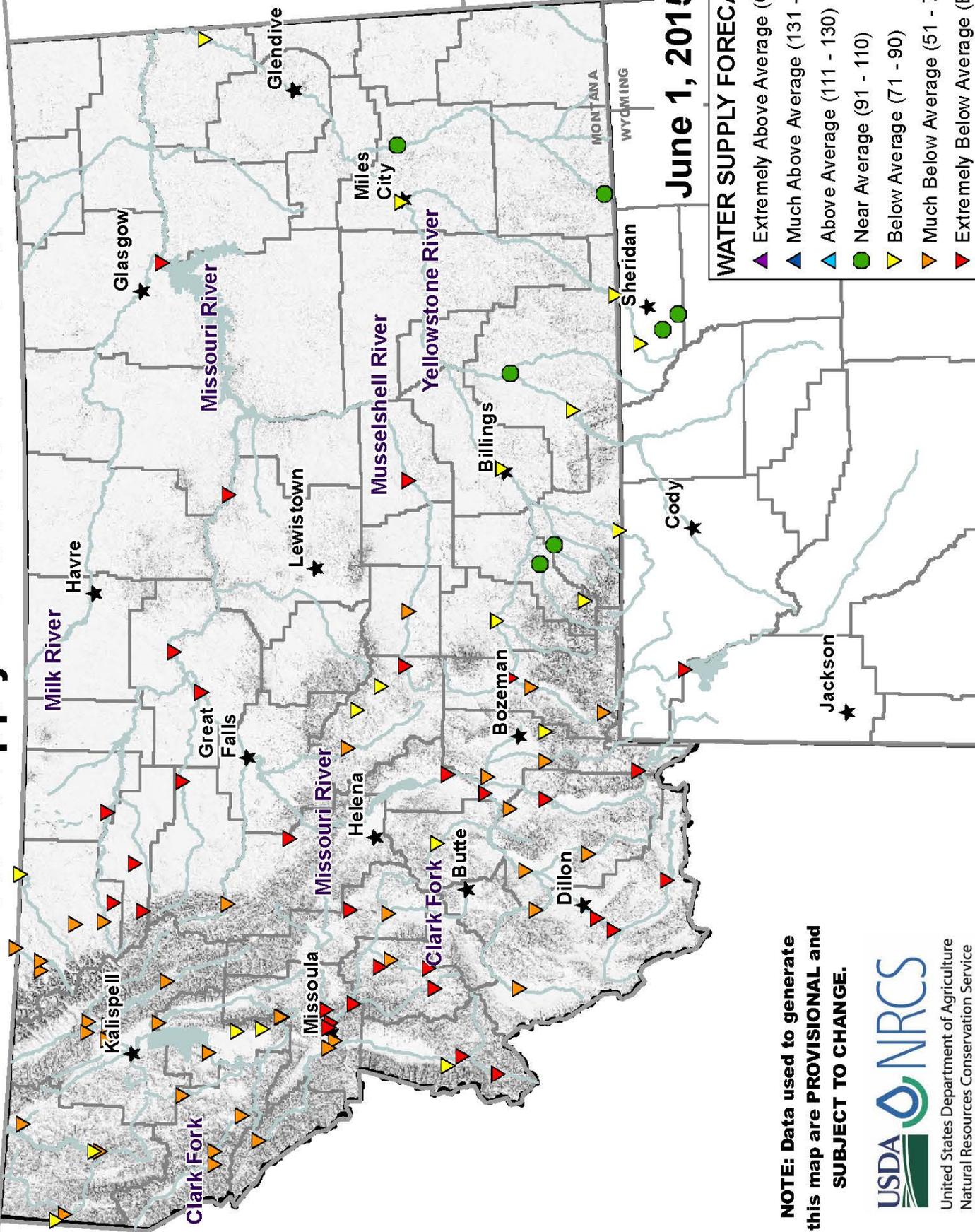
Consult the individual basin reports for a more comprehensive guide to individual basin conditions and expected streamflows this spring.

Following are streamflow forecasts for the period June 1 through July 31. **THE FIGURES IN THE TABLE BELOW ARE AN AVERAGE OF ALL FORECASTS WITHIN THE PARTICULAR BASIN AT THE 50 PERCENT EXCEEDANCE ONLY. ALL 50 PERCENT EXCEEDANCE FORECASTS ASSUME NEAR NORMAL WEATHER THROUGH THE END OF THE FORECAST PERIOD.**

FOR FORECASTS ABOVE AND BELOW THE 50 PERCENT EXCEEDANCE, LOOK TO THE SPECIFIC BASIN REPORTS.

| <i><b>June-July Streamflow</b></i> |            |             |
|------------------------------------|------------|-------------|
| <i><b>6/1/2015</b></i>             | % Average  | % Last Year |
| <b>Columbia River Basin</b>        | <b>58%</b> | <b>46%</b>  |
| Kootenai in Montana                | 61%        | 68%         |
| Flathead in Montana                | 59%        | 39%         |
| Upper Clark Fork                   | 45%        | 36%         |
| Bitterroot                         | 56%        | 38%         |
| Lower Clark Fork                   | 57%        | 41%         |
| <b>Missouri River Basin</b>        | <b>48%</b> | <b>42%</b>  |
| Jefferson                          | 54%        | 57%         |
| Madison                            | 45%        | 50%         |
| Gallatin                           | 54%        | 51%         |
| Headwaters Mainstem                | 48%        | 41%         |
| Smith-Judith-Musselshell           | 52%        | 44%         |
| Sun-Teton-Marias                   | 44%        | 29%         |
| St. Mary                           | 55%        | 36%         |
| <b>Yellowstone River Basin</b>     | <b>73%</b> | <b>52%</b>  |
| Upper Yellowstone                  | 68%        | 50%         |
| Lower Yellowstone                  | 77%        | 53%         |
|                                    |            |             |
| East of Divide                     | 60%        | 47%         |
| West of Divide                     | 58%        | 46%         |
| <b>Montana State-Wide</b>          | <b>59%</b> | <b>47%</b>  |

# Water Supply Forecast for Montana



June 1, 2015

**NOTE: Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.**

# SWSI

The Surface Water Supply Index (SWSI) is a measure of available surface water availability for the spring and summer months. Water users that rely on mountain precipitation can use the index to evaluate seasonal surface water supplies. The SWSI accounts for mountain snowpack, mountain precipitation, streamflow, reservoir storage, and soil moisture.

| Watershed                         | This month's SWSI | Last Year's SWSI |
|-----------------------------------|-------------------|------------------|
| Marias above Tiber Reservoir      | -2.7              | 1.0              |
| Tobacco                           | -3.1              | 1.1              |
| Kootenai Ft. Steele to Libby Dam  | -1.1              | 1.8              |
| Kootenai below Libby Dam          | 0.4               | 1.4              |
| Fisher                            | -2.2              | 1.4              |
| Yaak                              | -2.5              | 1.3              |
| North Fk. Flathead                | -3.3              | 2.4              |
| Middle Fk. Flathead               | -2.9              | 2.4              |
| South Fk. Flathead                | -1.6              | 3.1              |
| Flathead at Columbia Falls        | -2.7              | 2.0              |
| Swan                              | -3.8              | 2.5              |
| Flathead at Polson                | -2.9              | 2.9              |
| Mission Valley                    | -3.4              | -0.6             |
| Little Bitterroot                 | 2.0               | 2.1              |
| Clark Fork above Milltown         | -3.3              | 1.1              |
| Blackfoot                         | -3.3              | 2.5              |
| Clark Fork above Missoula         | -3.4              | 1.7              |
| Bitterroot                        | -2.0              | 2.4              |
| Clark Fork River below Bitterroot | -3.0              | 1.9              |
| Clark Fork River below Flathead   | -2.9              | 2.5              |
| Beaverhead                        | -1.6              | -1.6             |
| Ruby                              | -2.0              | -0.7             |
| Big Hole                          | -1.1              | 2.3              |
| Boulder (Jefferson)               | -0.7              | 2.8              |
| Jefferson                         | -0.9              | 1.8              |
| Madison                           | -3.1              | 0.3              |
| Gallatin                          | -2.9              | 2.2              |
| Missouri above Canyon Ferry       | -2.5              | 0.9              |
| Missouri below Canyon Ferry       | -2.0              | 1.1              |
| Smith                             | -1.7              | 2.9              |
| Sun                               | -2.5              | 1.4              |
| Teton                             | -1.5              | 1.2              |
| Birch/Dupuyer Creeks              | -1.1              | -0.2             |
| Marias                            | -0.2              | 1.6              |
| Musselshell                       | 0.0               | 2.1              |
| Missouri above Fort Peck          | -0.5              | 0.7              |
| Missouri below Fort Peck          | -0.5              | 0.5              |
| Milk                              |                   |                  |
| Dearborn near Craig               | -3.1              | 1.3              |
| Yellowstone above Livingston      | -2.7              | 3.2              |
| Shields                           | -2.4              | 3.3              |
| Boulder (Yellowstone)             | -2.5              | 3.5              |
| Stillwater                        | -1.4              | 3.0              |
| Rock/Red Lodge Creeks             | 1.6               | 3.4              |
| Clarks Fork Yellowstone           | -1.3              | 3.8              |
| Yellowstone above Bighorn River   | -2.1              | 3.2              |
| Bighorn below Bighorn Lake        | 1.3               | 2.4              |
| Little Bighorn                    | -0.7              | 2.5              |
| Yellowstone below Bighorn         | -0.6              | 2.9              |
| Tongue                            | 0.9               | 3.1              |
| Powder                            | 0.2               | 2.2              |
| Upper Judith                      | 0.3               | 1.0              |
| Saint Mary                        | -3.3              | 1.8              |

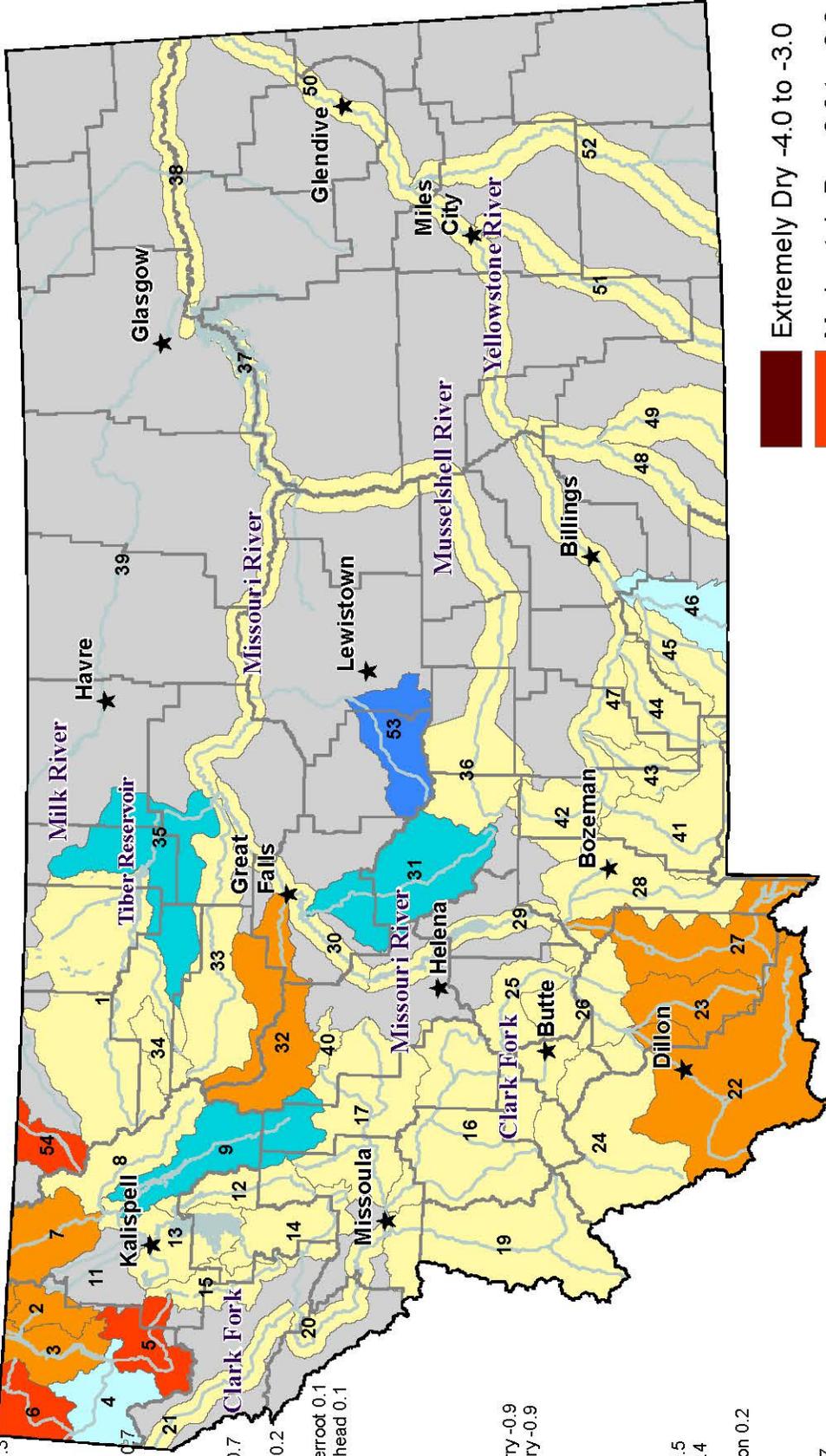
**SWSI Scale**

|              |                |
|--------------|----------------|
| +3.0 to +4.0 | Extremely Wet  |
| +2.0 to +2.9 | Moderately Wet |
| +1.0 to +1.9 | Slightly Wet   |
| +0.9 to -0.9 | Near Average   |
| -1.0 to -1.9 | Slightly Dry   |
| -2.0 to -2.9 | Moderately Dry |
| -3.0 to -4.0 | Extremely Dry  |

# Surface Water Supply Index (SWSI) Values

## RIVER INDEX & SWSI VALUES

- 1 Marias above Tiber Reservoir -0.7
- 2 Tobacco -1.4
- 3 Kootenai Ft. Steele to Libby Dam -1.4
- 4 Kootenai below Libby Dam 1.3
- 5 Fisher -2.4
- 6 Yaak -2.4
- 7 North Fk. Flathead -1.8
- 8 Middle Fk. Flathead -0.7
- 9 South Fk. Flathead 2.9
- 10 Flathead at Columbia Falls 0.7
- 11 Kalispell 8
- 12 Swan 0.7
- 13 Flathead at Polson 0.2
- 14 Mission Valley 0.2
- 15 Little Bitterroot -0.2
- 16 Clark Fork above Milltown 0.7
- 17 Blackfoot -0.2
- 18 Clark Fork above Missoula 0.2
- 19 Bitterroot -0.2
- 20 Clark Fork River below Bitterroot 0.1
- 21 Clark Fork River below Flathead 0.1
- 22 Beaverhead -1.8
- 23 Ruby -1.8
- 24 Big Hole 0.5
- 25 Boulder (Jefferson) 0.2
- 26 Jefferson -0.4
- 27 Madison -1.8
- 28 Gallatin -0.9
- 29 Missouri above Canyon Ferry -0.9
- 30 Missouri below Canyon Ferry -0.9
- 31 Smith 2.1
- 32 Sun -1.1
- 33 Teton 0.6
- 34 Birch/Dupuyer Creeks -0.5
- 35 Marias 2
- 36 Musselshell 0.9
- 37 Missouri above Fort Peck 0.5
- 38 Missouri below Fort Peck 0.4
- 40 Dearborn near Craig -0.5
- 41 Yellowstone above Livingston 0.2
- 42 Shields -0.7
- 43 Boulder (Yellowstone) 0.2
- 44 Stillwater 0.2
- 45 Rock/Red Lodge Creeks 0.7
- 46 Clark's Fork Yellowstone 1.6
- 47 Yellowstone above Bighorn River 0.4
- 48 Bighorn below Bighorn Lake 0.5
- 49 Little Bighorn 0
- 50 Yellowstone below Bighorn 0.5
- 51 Tongue 0.5
- 52 Powder 0.2
- 53 Upper Judith 3.7
- 54 Saint Mary -2.7

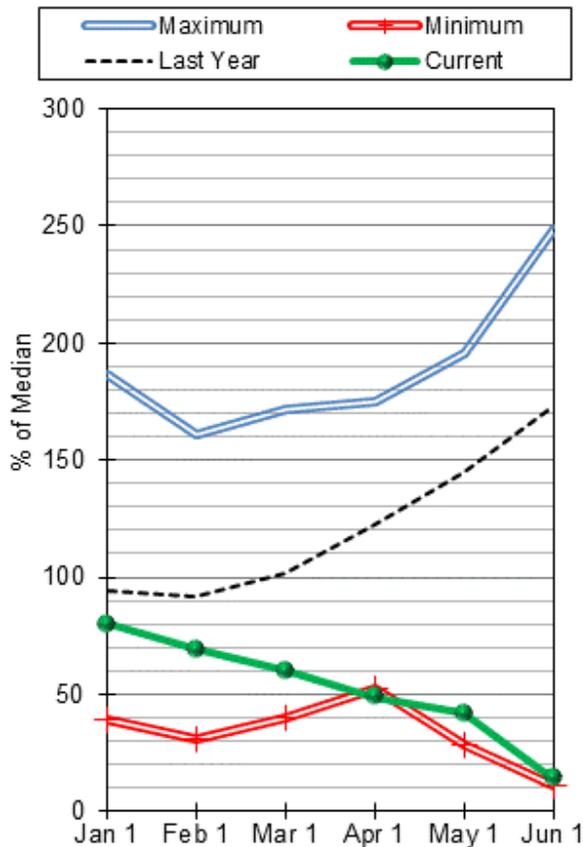


**March 1, 2015**

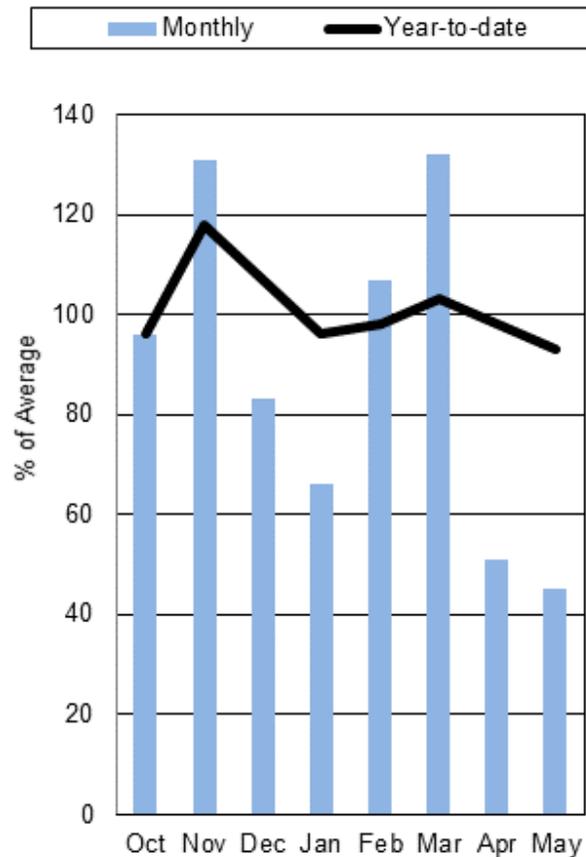
**NOTE: Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.**

# Kootenai River Basin in Montana

## Mountain Snowpack



## Precipitation



Snowpack in the Kootenai River Basin both in Canada and Montana disappeared throughout the month of May. Only a handful of sites, most of them in Canada, had any measurable snow on June 1<sup>st</sup>. For an area of Montana that is known for deep snow packs, it wasn't the case this winter. Low elevation snowpack made the transition to melt mid-March when rain on snow events increased river flows, likely numerical peak flows for the year on some streams, and began snowmelt. Most low elevation sites had melted out between mid to late April. The upper elevations in the basin were able to prolong their snowpack, but after mid-April made a rapid transition to melt which persisted through May. Snowpack in the basin is well below normal, approaching record low for this date. Snowmelt contribution to river flows is all but over on the Montana side of the border, and summer streamflow will be reliant on future precipitation. As a whole, the snowpack in the Kootenai River basin is currently 14 percent of normal for June 1<sup>st</sup>, and 8 percent of last year at this time.

Mountain precipitation for May was once again well below average throughout the basin and ranged from 29 percent of average in the Tobacco River Drainage to 56 percent of average in the Yaak River Basin. May valley precipitation was also well below average. Overall, the Kootenai River Basin in Montana was 45 percent of average for the month of May. Water year-to-date basin wide precipitation is 92 percent of average for June 1<sup>st</sup>, and 92 percent of last year.

Reservoir storage in Lake Koocanusa is 117 percent of average.

Fortunately, snowpack on the Canadian side is in slightly better shape and will provide some runoff on the mainstem of the Kootenai. Smaller rivers fed from the Montana side of the border will see well below average streamflows this summer unless substantial precipitation occurs. The basin-wide average June-July streamflow forecast for the Kootenai River is currently 61 percent of average and 68 percent of last year.

## Kootenai River Basin In Montana Streamflow Forecasts - June 1, 2015

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

| KOOTENAI RIVER BASIN in MONTANA     | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|-------------------------------------|-----------------|-----------|-----------|-----------|-------|-----------|-----------|----------------|
| Tobacco R nr Eureka                 | JUN-JUL         | 13.1      | 24        | 31        | 53%   | 38        | 48        | 58             |
|                                     | JUN-SEP         | 19        | 32        | 41        | 58%   | 50        | 63        | 71             |
| Libby Reservoir Inflow <sup>1</sup> | JUN-JUL         | 2230      | 2670      | 2870      | 89%   | 3070      | 3520      | 3240           |
|                                     | JUN-SEP         | 2900      | 3450      | 3700      | 89%   | 3950      | 4500      | 4150           |
| Fisher R nr Libby                   | JUN-JUL         | 15.5      | 27        | 36        | 59%   | 44        | 56        | 61             |
|                                     | JUN-SEP         | 24        | 38        | 47        | 63%   | 57        | 70        | 75             |
| Yaak R nr Troy                      | JUN-JUL         | 31        | 57        | 75        | 58%   | 93        | 119       | 130            |
|                                     | JUN-SEP         | 44        | 73        | 92        | 61%   | 112       | 140       | 150            |
| Kootenai R at Leonia <sup>1,2</sup> | JUN-JUL         | 1730      | 2320      | 2590      | 71%   | 2860      | 3460      | 3640           |
|                                     | JUN-SEP         | 2430      | 3150      | 3480      | 75%   | 3810      | 4530      | 4640           |

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

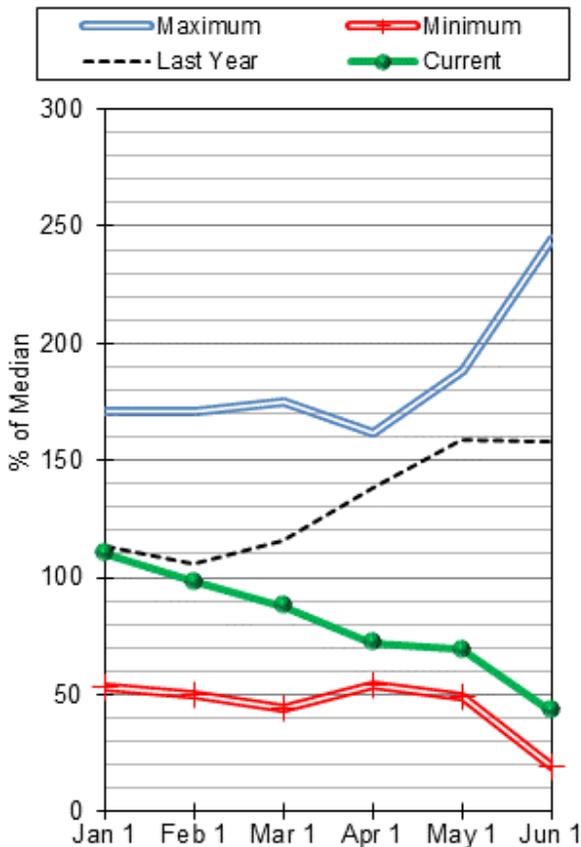
3) Median value used in place of average

| Reservoir Storage<br>End of May, 2015 | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---------------------------------------|---------------|-----------------|---------------|----------------|
| Lake Koocanusa                        | 4362.7        | 3779.5          | 3736.0        | 5748.0         |
| Basin-wide Total                      | 4362.7        | 3779.5          | 3736.0        | 5748.0         |
| # of reservoirs                       | 1             | 1               | 1             | 1              |

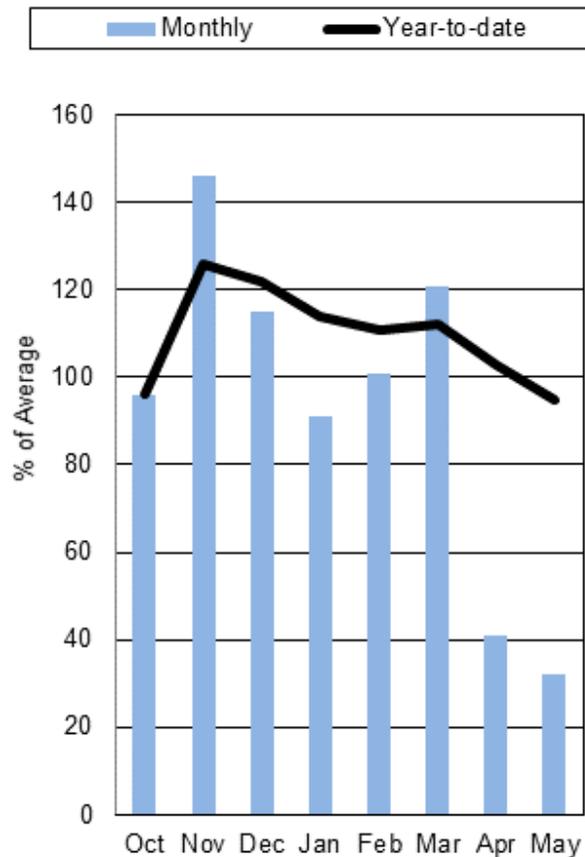
| Watershed Snowpack Analysis<br>June 1, 2015 | # of Sites | % Median | Last Year % Median |
|---|------------|----------|--------------------|
| KOOTENAY in CANADA                          | 5          | 45%      | 136%               |
| KOOTENAI MAINSTEM                           | 3          | 0%       | 217%               |
| TOBACCO                                     | 2          | 35%      | 143%               |
| FISHER                                      | 1          |          |                    |
| YAAK  | 2          | 0%       | 93%                |
| KOOTENAI RIVER BASIN in MONTANA             | 8          | 14%      | 165%               |
| KOOTENAI ab BONNERS FERRY                   | 12         | 37%      | 148%               |

# Flathead River Basin

## Mountain Snowpack



## Precipitation



Like to Kootenai River Basin, this winter’s snowpack in the Flathead struggled. By far the most snow can be found currently in the Swan River drainage. All low to mid-elevation SNOTEL sites melted out in early May. Upper elevations will provide some additional flow in the next month, but a substantial portion of the snow water has entered the river systems earlier than normal this spring. As of June 1, all the remaining snowpack can be found at the very high elevations. As a whole, the snowpack in the Flathead River basin is currently 43 percent of normal for June 1<sup>st</sup>, and 27 percent of last year at this time.

Two small storms dropped precipitation in the basin during May, one around mid-month, and the other towards the end of the month. Mountain precipitation received from these storms was not enough bring the basin to near average precipitation, and valley stations did not fare any better. Overall, June precipitation for the Flathead River Basin was 32 percent of average. Water year-to-date basin wide precipitation is 95 percent of average for June 1<sup>st</sup>, and 89 percent of last year at this time.

Combined reservoir storages for the end of May are 108 percent of average for June 1<sup>st</sup>, and 109 percent of last year at this time.

River flows in the greater Flathead Basin were well above average in many locations from the middle of March into the middle of April. After this time many rivers trended towards average conditions, until the beginning of May when flows fell below average. This trend is expected to persist, with below normal flows into the summer time period. April and May have been below average for precipitation, a major change to a wetter pattern would be favorable for river volumes as the snowmelt component only has high elevation snowpack left to melt. The basin-wide average June-July streamflow forecast for the Flathead River is currently 59 percent of average and 39 percent of last year.

## Flathead River Basin Streamflow Forecasts - June 1, 2015

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

| FLATHEAD RIVER BASIN                         | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|--|-----------------|-----------|-----------|-----------|-------|-----------|-----------|----------------|
| NF Flathead R nr Columbia Falls              | JUN-JUL         | 230       | 340       | 415       | 54%   | 485       | 595       | 775            |
|  | JUN-SEP         | 340       | 460       | 545       | 58%   | 630       | 750       | 935            |
| MF Flathead R nr West Glacier                | JUN-JUL         | 260       | 375       | 455       | 60%   | 530       | 650       | 755            |
|  | JUN-SEP         | 355       | 480       | 565       | 63%   | 650       | 775       | 890            |
| Sf Flathead R nr Hungry Horse                | JUN-JUL         | 215       | 290       | 340       | 60%   | 390       | 460       | 565            |
|  | JUN-SEP         | 265       | 345       | 400       | 63%   | 450       | 530       | 635            |
| Hungry Horse Reservoir Inflow <sup>1,2</sup> | JUN-JUL         | 290       | 460       | 540       | 63%   | 620       | 795       | 860            |
|  | JUN-SEP         | 365       | 555       | 640       | 65%   | 725       | 910       | 980            |
| Flathead R at Columbia Falls <sup>2</sup>    | JUN-JUL         | 890       | 1220      | 1440      | 59%   | 1660      | 1990      | 2460           |
|  | JUN-SEP         | 1180      | 1550      | 1800      | 62%   | 2040      | 2410      | 2890           |
| Ashley Ck nr Marion <sup>2</sup>             |                 |           |           |           |       |           |           |                |
| Swan R nr Bigfork                            | JUN-JUL         | 109       | 137       | 157       | 56%   | 177       | 205       | 280            |
|  | JUN-SEP         | 145       | 180       | 205       | 58%   | 230       | 265       | 355            |
| Flathead Lake Inflow <sup>1,2</sup>          | JUN-JUL         | 870       | 1430      | 1680      | 59%   | 1930      | 2480      | 2860           |
|  | JUN-SEP         | 1120      | 1750      | 2040      | 61%   | 2330      | 2960      | 3320           |
| Mill Ck ab Bassoo ck nr Niarada              | JUN-JUL         | 0.32      | 0.64      | 0.86      | 69%   | 1.08      | 1.4       | 1.25           |
|  | JUN-SEP         | 0.56      | 0.91      | 1.15      | 73%   | 1.38      | 1.73      | 1.58           |
| South Crow Ck nr Ronan                       | JUN-JUL         | 3.3       | 4.3       | 5         | 77%   | 5.7       | 6.7       | 6.5            |
|  | JUN-SEP         | 4.3       | 5.4       | 6.2       | 78%   | 7         | 8.2       | 7.9            |
| Mission Ck nr St. Ignatius                   | JUN-JUL         | 11.6      | 13.3      | 14.4      | 81%   | 15.6      | 17.3      | 17.7           |
|  | JUN-SEP         | 14.7      | 17        | 18.5      | 84%   | 20        | 22        | 22             |
| SF Jocko R nr Arlee                          | JUN-JUL         | 6.8       | 9.1       | 10.7      | 63%   | 12.2      | 14.5      | 17.1           |
|  | JUN-SEP         | 9.8       | 12.3      | 14        | 67%   | 15.8      | 18.3      | 21             |
| NF Jocko R bl Tabor Feeder Canal             | JUN-JUL         | 6.2       | 7.9       | 9.2       | 60%   | 10.4      | 12.1      | 15.4           |
|  | JUN-SEP         | 7.5       | 9.6       | 11        | 64%   | 12.4      | 14.4      | 17.3           |

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

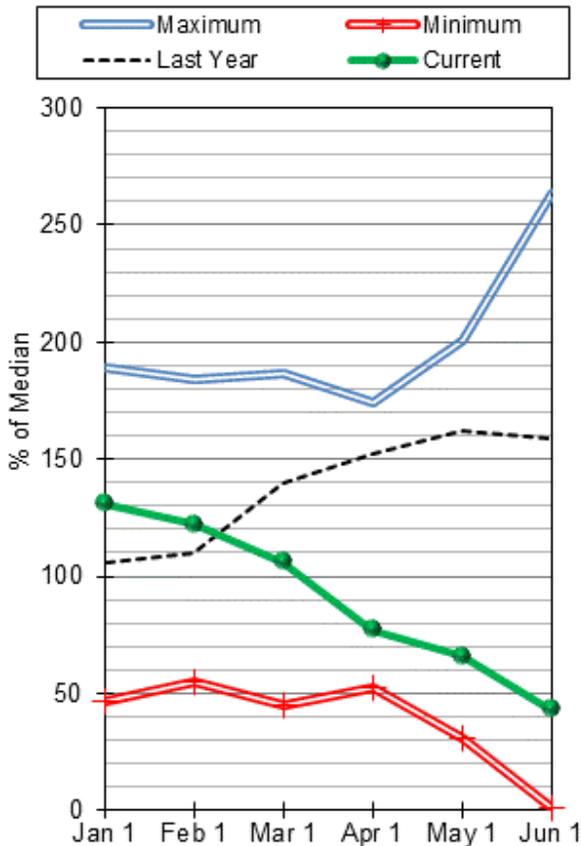
3) Median value used in place of average

| Reservoir Storage<br>End of May, 2015 | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---------------------------------------|---------------|-----------------|---------------|----------------|
| Camas (4)                             | 40.6          | 38.8            | 28.6          | 45.2           |
| Lower Jocko Lake                      | 2.8           | 5.3             | 3.7           | 6.4            |
| Mission Valley (8)                    | 46.0          | 49.7            | 63.0          | 100.0          |
| Hungry Horse Lake                     | 3048.6        | 2641.7          | 2733.0        | 3451.0         |
| Flathead Lake                         | 1584.4        | 1589.4          | 1538.0        | 1791.0         |
| Basin-wide Total                      | 4722.3        | 4324.9          | 4366.3        | 5393.6         |
| # of reservoirs                       | 5             | 5               | 5             | 5              |

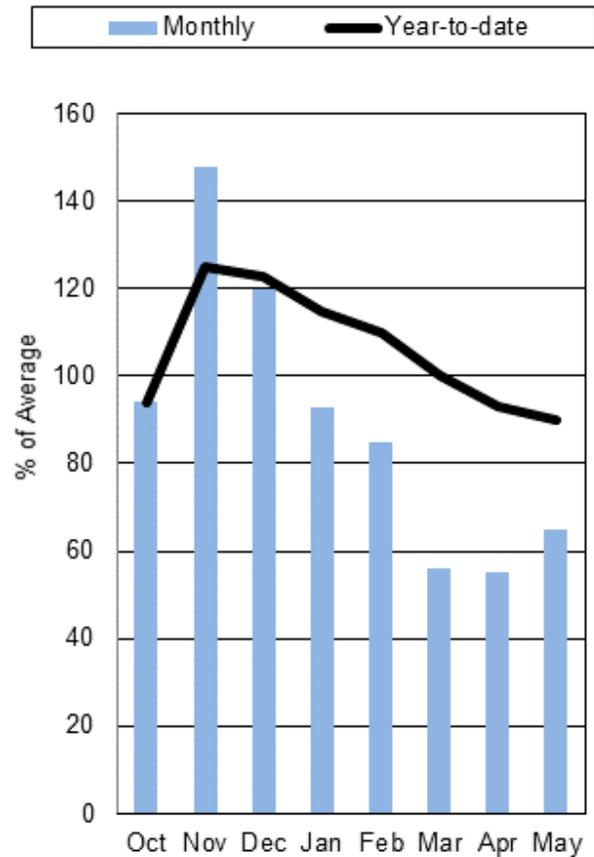
| Watershed Snowpack Analysis<br>June 1, 2015 | # of Sites | % Median | Last Year % Median |
|---|------------|----------|--------------------|
| NF FLATHEAD in CANADA                       | 1          | 0%       | 116%               |
| NF FLATHEAD in MONTANA                      | 6          | 45%      | 175%               |
| MIDDLE FORK FLATHEAD                        | 3          | 45%      | 151%               |
| SOUTH FORK FLATHEAD                         | 2          | 42%      | 118%               |
| STILLWATER-WHITEFISH                        | 5          | 44%      | 228%               |
| SWAN  | 3          | 45%      | 140%               |
| MISSION VALLEY                              | 2          | 65%      | 142%               |
| LITTLE BITTERROOT-ASHLEY                    | 0          |          |                    |
| JOCKO                                       | 3          | 42%      | 167%               |
| FLATHEAD in MONTANA                         | 16         | 43%      | 159%               |
| FLATHEAD RIVER BASIN                        | 17         | 42%      | 157%               |

# Upper Clark Fork River Basin

## Mountain Snowpack



## Precipitation



Snowmelt was early this year in the Upper Clark Fork River basin at mid to low elevations, low elevations in made the transition to melt during mid-March, and most other elevations made the transition during the latter half of April. Snowpack declined significantly during May and like the other basins west of the Divide, the only remaining snowpack on June 1 was found at the highest elevations. As a whole, the snowpack in the Upper Clark Fork River basin is currently 43 percent of normal for June 1<sup>st</sup>, and 27 percent of last year at this time.

A series of storms throughout May brought precipitation to some parts of the Upper Clark Fork River Basin but in general well below average increments were recorded. Higher increments were seen in the upper reaches of the basin. However a few mountain sites recorded near to a little above average precipitation for May. Valley stations were not so lucky either and some low valley areas within the basin are extremely dry for this time of year. Basin-wide May precipitation was 65 percent of average for the month. Water year-to-date basin wide precipitation is currently 100 percent of average for June 1<sup>st</sup>, and 97 percent of last year at this time.

Basin-wide reservoir storage is at 97 percent of average and 121 percent of last year of last year at this time.

Early snowmelt at the low and mid elevations in the basin have decreased the amount of water available during the next few months. Upper elevation snowpack and future precipitation events will drive the summer streamflows. The basin-wide average June-July streamflow forecast for the Upper Clark Fork River basin is currently 45 percent of average and 36 percent of last year.

## Upper Clark Fork River Basin Streamflow Forecasts - June 1, 2015

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

| UPPER CLARK FORK RIVER BASIN                  | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|---|-----------------|-----------|-----------|-----------|-------|-----------|-----------|----------------|
| Little Blackfoot nr Garrison                  | JUN-JUL         | 3         | 11.5      | 17.2      | 59%   | 23        | 31        | 29             |
|   | JUN-SEP         | 6.1       | 15.9      | 23        | 64%   | 29        | 39        | 36             |
| Flint Ck nr Southern Cross                    | JUN-JUL         | 0.95      | 2         | 2.9       | 43%   | 4         | 5.8       | 6.8            |
|   | JUN-SEP         | 1.2       | 2.5       | 3.7       | 41%   | 5.2       | 7.7       | 9              |
| Flint Ck bl Boulder Ck                        | JUN-JUL         | 2.8       | 10.9      | 16.5      | 53%   | 22        | 30        | 31             |
|   | JUN-SEP         | 12.3      | 23        | 30        | 68%   | 38        | 49        | 44             |
| Lower Willow Ck Reservoir Inflow <sup>2</sup> | JUN-JUL         | 0.44      | 0.96      | 1.4       | 39%   | 2         | 3         | 3.6            |
|   | JUN-SEP         | 0.99      | 1.66      | 2.2       | 49%   | 2.8       | 3.9       | 4.5            |
| MF Rock Ck nr Philipsburg                     | JUN-JUL         | 2.2       | 9.7       | 14.8      | 44%   | 19.9      | 27        | 34             |
|   | JUN-SEP         | 6         | 14.4      | 20        | 49%   | 26        | 34        | 41             |
| Rock Ck nr Clinton                            | JUN-JUL         | 0.3       | 30        | 51        | 39%   | 71        | 102       | 131            |
|   | JUN-SEP         | 16.9      | 51        | 75        | 46%   | 98        | 133       | 164            |
| Clark Fork R ab Milltown                      | JUN-JUL         | 49        | 83        | 112       | 41%   | 145       | 200       | 270            |
|   | JUN-SEP         | 86        | 134       | 172       | 48%   | 215       | 290       | 355            |
| Nevada Ck nr Helmville                        | JUN-JUL         | 0.73      | 1.57      | 2.3       | 40%   | 3.3       | 4.9       | 5.8            |
|   | JUN-SEP         | 1.3       | 2.4       | 3.3       | 46%   | 4.4       | 6.3       | 7.2            |
| Blackfoot R nr Bonner                         | JUN-JUL         | 81        | 125       | 154       | 47%   | 184       | 225       | 325            |
|   | JUN-SEP         | 133       | 181       | 215       | 53%   | 245       | 295       | 405            |
| Clark Fork R ab Missoula                      | JUN-JUL         | 96        | 198       | 265       | 45%   | 335       | 440       | 595            |
|   | JUN-SEP         | 186       | 305       | 390       | 51%   | 470       | 590       | 765            |

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

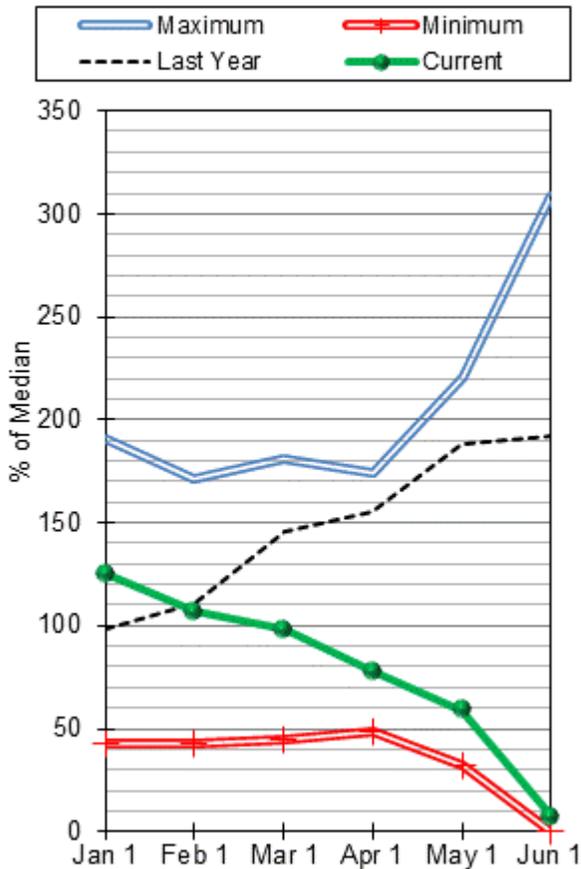
3) Median value used in place of average

| Reservoir Storage<br>End of May, 2015 | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---------------------------------------|---------------|-----------------|---------------|----------------|
| East Fork Rock Creek Res              | 10.8          | 12.0            | 10.6          | 15.6           |
| Georgetown Lake                       | 29.9          | 28.8            | 29.1          | 31.0           |
| Lower Willow Creek Reservoir          |               | 5.0             | 4.7           | 4.9            |
| Nevada Creek Res                      | 9.9           | 11.5            | 10.9          | 12.6           |
| Basin-wide Total                      | 50.6          | 52.3            | 50.6          | 59.2           |
| # of reservoirs                       | 3             | 3               | 3             | 3              |

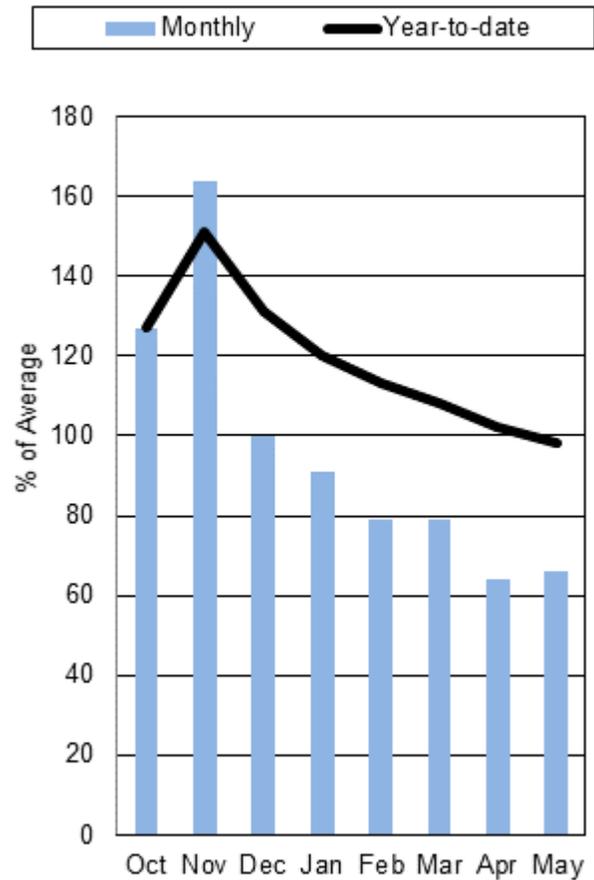
| Watershed Snowpack Analysis<br>June 1, 2015 | # of Sites | % Median | Last Year % Median |
|---|------------|----------|--------------------|
| CLARK FORK ab FLINT CREEK                   | 5          | 56%      | 144%               |
| FLINT CREEK                                 | 4          | 0%       | 593%               |
| ROCK CREEK                                  | 2          | 0%       | 131%               |
| CLARK FORK ab BLACKFOOT                     | 10         | 44%      | 150%               |
| BLACKFOOT                                   | 5          | 39%      | 171%               |
| UPPER CLARK FORK RIVER BASIN                | 14         | 43%      | 158%               |

# Bitterroot River Basin

## Mountain Snowpack



## Precipitation



The majority of the remaining snowpack from April disappeared pretty quickly during the month of May. Only one high elevation SNOTEL site recorded any measurable snow on June 1. A storm did hit the basin mid-month which slowed the melt down a little, and some high elevation sites did accumulate snow. However, this was short lived and sites within the basin continued with consistent melt for the rest of the month. As a whole, the snowpack in the Bitterroot River basin is currently 7 percent of normal for June 1<sup>st</sup>, and 4 percent of last year at this time.

Mountain precipitation during May was quite variable throughout the basin. SNOTEL sites in the West Fork of the Bitterroot received the best increments and ended up with near average monthly precipitation at 97 percent of average. SNOTEL sites on the east side of the Bitterroot Basin received slightly below average precipitation at 87 percent of average. SNOTEL sites on the west side of the basin were well below average at only 40 percent of average. Valley stations were near average for May. Basin-wide May precipitation was only 66 percent of average. Water year-to-date basin wide precipitation is currently 98 percent of average for June 1<sup>st</sup>, and 84 percent of last year at this time.

Painted Rocks (West Fork Bitterroot) Reservoir is currently 103 percent of average. Lake Como is currently 118 percent of average. Combined these are 111 percent of average and 112 percent of last year.

The lack of snowpack at SNOTEL elevations has decreased the forecast from last month for the summer streamflows. The basin-wide average June-July streamflow forecast for the Bitterroot River basin is currently 56 percent of average and 38 percent of last year.

## Bitterroot River Basin Streamflow Forecasts - June 1, 2015

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

| BITTERROOT RIVER BASIN                 | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|--|-----------------|-----------|-----------|-----------|-------|-----------|-----------|----------------|
| WF Bitterroot R Nr Conner <sup>2</sup> | JUN-JUL         | 9.9       | 13.5      | 16.3      | 29%   | 19.4      | 24        | 56             |
|  | JUN-SEP         | 15.2      | 20        | 24        | 36%   | 28        | 34        | 67             |
| Bitterroot R Nr Darby                  | JUN-JUL         | 56        | 77        | 92        | 44%   | 107       | 128       | 210            |
|  | JUN-SEP         | 102       | 129       | 148       | 55%   | 166       | 193       | 270            |
| Como Reservoir Inflow <sup>2</sup>     | JUN-JUL         | 16.6      | 25        | 30        | 79%   | 35        | 43        | 38             |
|  | JUN-SEP         | 19.1      | 27        | 33        | 79%   | 39        | 47        | 42             |
| Bitterroot R nr Missoula               | JUN-JUL         | 240       | 315       | 370       | 62%   | 425       | 500       | 600            |
|  | JUN-SEP         | 220       | 310       | 365       | 52%   | 425       | 515       | 705            |

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

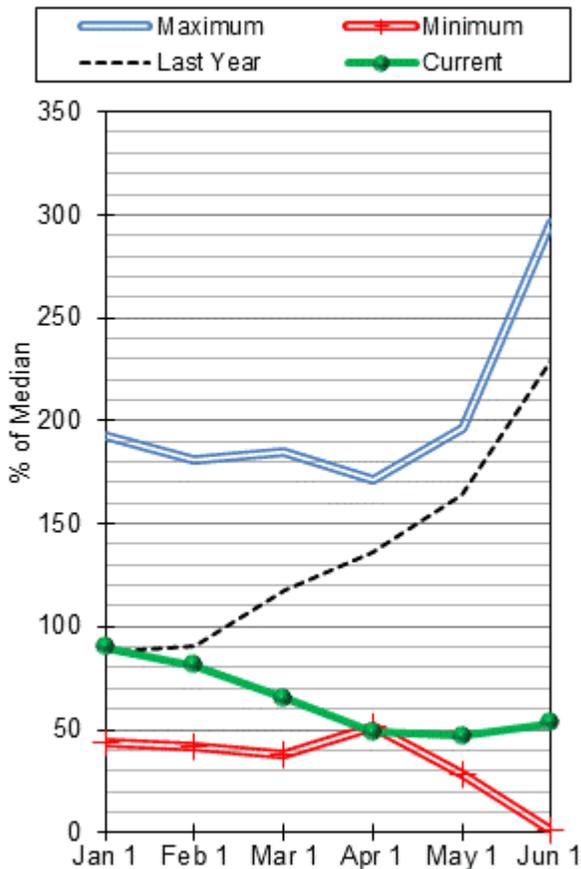
3) Median value used in place of average

| Reservoir Storage<br>End of May, 2015 | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---------------------------------------|---------------|-----------------|---------------|----------------|
| Painted Rocks Lake                    | 33.3          | 34.3            | 32.3          | 31.7           |
| Lake Como                             | 39.1          | 30.7            | 33.2          | 34.9           |
| Basin-wide Total                      | 72.5          | 65.0            | 65.5          | 66.6           |
| # of reservoirs                       | 2             | 2               | 2             | 2              |

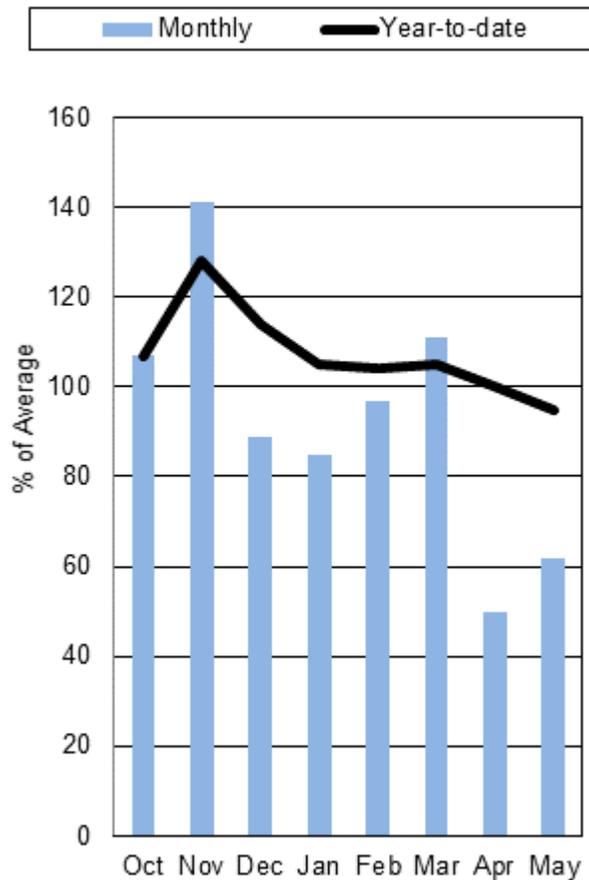
| Watershed Snowpack Analysis<br>June 1, 2015 | # of Sites | % Median | Last Year % Median |
|---|------------|----------|--------------------|
| WEST FORK BITTERROOT                        | 2          | 22%      | 207%               |
| EAST SIDE BITTERROOT                        | 3          | 13%      | 165%               |
| WEST SIDE BITTERROOT                        | 3          | 0%       | 229%               |
| BITTERROOT RIVER BASIN                      | 7          | 7%       | 192%               |

# Lower Clark Fork River Basin

## Mountain Snowpack



## Precipitation



As with the other basins west of the Divide, all remaining snow from the end of April has disappeared at all but the highest elevations. Only two high elevation SNOTEL sites have measurable snow on June 1<sup>st</sup> and are well below average. A storm that hit the basin mid-month did slow down the melt a little at the higher elevations, but melt persisted through the end of the month shortly afterwards. As a whole, the snowpack in the Lower Clark Fork River basin is currently 53 percent of normal for June 1<sup>st</sup>, and 23 percent of last year at this time.

May brought a storm mid-month and a stormier pattern towards the end of the month. However, this did not bring the percentages close to average for the month. May is typically a wet month for the mountains in this region. Unfortunately, this May did not follow that pattern. Basin wide-mountain precipitation was only 52 percent of average for May, but valley stations within the basin fared much better and ended the month with 92 percent of average. Basin-wide May precipitation was 62 percent of average. Water year-to-date basin-wide precipitation is currently 95 percent of average for June 1<sup>st</sup>, and 93 percent of last year at this time.

Reservoir storage in Noxon Reservoir is 100 percent of average and 99 percent of last year.

Summer and Fall flows look to be well below average for the time period this year. A return to a cooler and wet weather pattern could help to sustain flows, but the snowmelt component to the flows will be below average. The basin-wide average June-July streamflow forecast for the Lower Clark Fork River basin is currently 57 percent of average and 41 percent of last year.

## Lower Clark Fork River Basin Streamflow Forecasts - June 1, 2015

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

| LOWER CLARK FORK RIVER BASIN                     | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|--|-----------------|-----------|-----------|-----------|-------|-----------|-----------|----------------|
| Clark Fork R bl Missoula                         | JUN-JUL         | 370       | 525       | 635       | 53%   | 745       | 900       | 1200           |
|  | JUN-SEP         | 450       | 630       | 755       | 51%   | 880       | 1060      | 1470           |
| Clark Fork R at St. Regis <sup>1</sup>           | JUN-JUL         | 395       | 700       | 835       | 55%   | 975       | 1280      | 1530           |
|  | JUN-SEP         | 505       | 850       | 1010      | 54%   | 1160      | 1510      | 1880           |
| Clark Fork R nr Plains <sup>1,2</sup>            | JUN-JUL         | 1620      | 2320      | 2640      | 58%   | 2950      | 3650      | 4540           |
|  | JUN-SEP         | 1990      | 2830      | 3210      | 59%   | 3590      | 4420      | 5410           |
| Thompson nr Thompson Falls                       | JUN-JUL         | 26        | 37        | 44        | 63%   | 51        | 62        | 70             |
|  | JUN-SEP         | 41        | 54        | 62        | 67%   | 71        | 84        | 93             |
| Prospect Ck at Thompson Falls                    | JUN-JUL         | 12        | 15.8      | 18.4      | 53%   | 21        | 25        | 35             |
|  | JUN-SEP         | 17.7      | 22        | 25        | 58%   | 27        | 32        | 43             |
| Clark Fork R at Whitehorse Rapids <sup>1,2</sup> | JUN-JUL         | 1880      | 2630      | 2970      | 59%   | 3310      | 4060      | 5070           |
|  | JUN-SEP         | 2350      | 3240      | 3640      | 60%   | 4050      | 4940      | 6090           |

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

3) Median value used in place of average

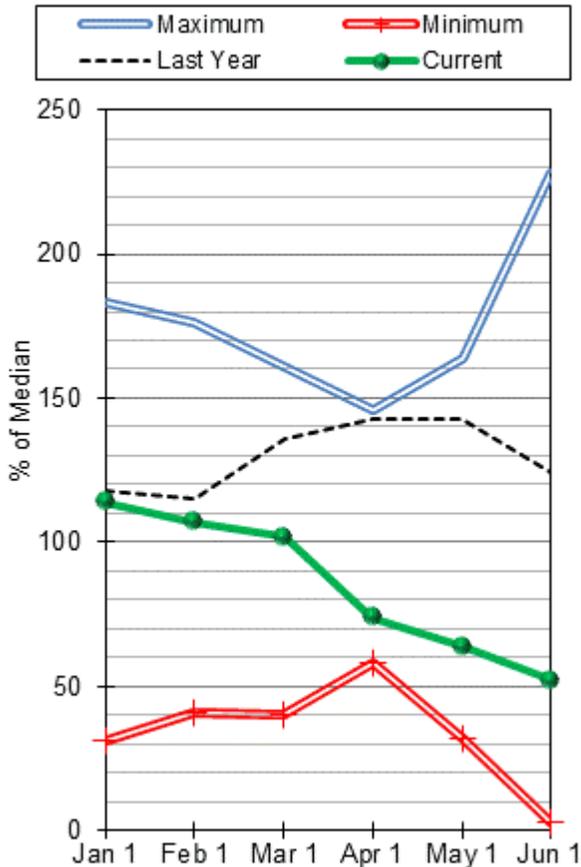
| Reservoir Storage<br>End of May, 2015 | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---------------------------------------|---------------|-----------------|---------------|----------------|
| Noxon Rapids Reservoir                | 324.4         | 328.7           | 324.2         | 335.0          |
| Basin-wide Total                      | 324.4         | 328.7           | 324.2         | 335.0          |
| # of reservoirs                       | 1             | 1               | 1             | 1              |

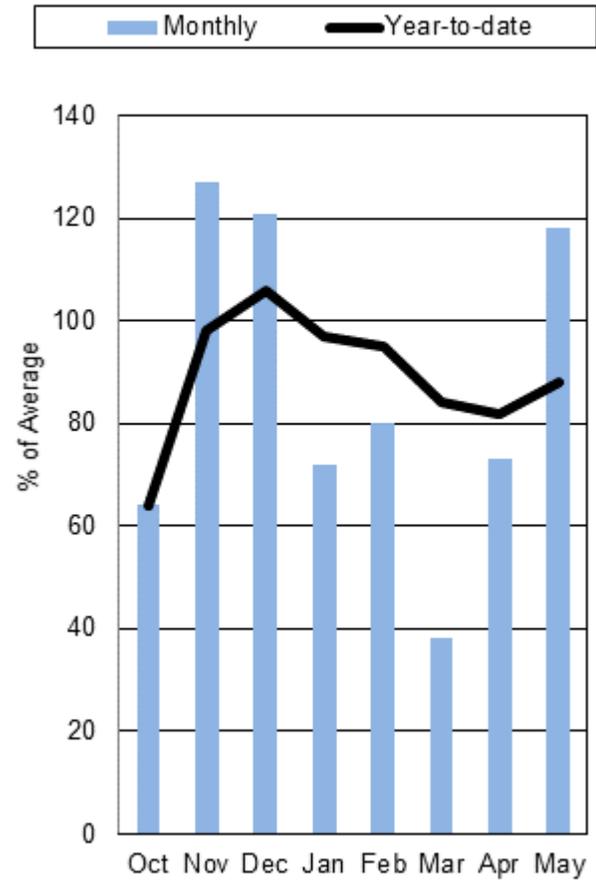
| Watershed Snowpack Analysis<br>June 1, 2015 | # of Sites | % Median | Last Year % Median |
|---|------------|----------|--------------------|
| LOWER CLARK FORK RIVER BASIN                | 7          | 53%      | 230%               |

# Jefferson River Basin

## Mountain Snowpack



## Precipitation



After a decent start to winter the Jefferson took a turn for the worse after December and never fully recovered before melt began this water year. Active melt began in the basin starting in mid-March at lower elevations, and most elevations made the transition to melt during the latter half of April. The return to a cooler and wet weather pattern during the second week in May did slow the melt at elevations where snowpack remained, but it did not stop the melt that had begun. As of June 1<sup>st</sup> 11 of the 19 SNOTEL sites in the Jefferson River basin had melted out, leaving only 24 percent of the peak snowpack remaining left to enter the river systems. Currently, higher elevations which received abundant early season moisture still have snowpack remaining, but snowpack is well below normal for what we typically have at this time. As a whole, the Jefferson River basin is currently 52 percent of normal for June 1<sup>st</sup>, and 42 percent of last year at this time.

Fortunately, May brought much needed precipitation after four continuous months of below average precipitation. Valley weather stations received 164 percent of monthly average precipitation for May, while mountain SNOTEL sites received 115 percent. Currently on June 1<sup>st</sup>, the Jefferson River Basin is 88 percent of the water year-to-date average, and 85 percent of last year at this time.

Clark Canyon Reservoir is currently at 86 percent of average, Lima Reservoir is 104 percent of average, and Ruby Reservoir is currently at 101 percent of average. Basin-wide reservoir storage is at 93 percent of average and 113 percent of last year of last year at this time.

Streamflows during the March to end of May time period have been above average, indicating that the snow water entered the system early. Streamflows have been on the rise since the second week of May due to the snowmelt and precipitation during the month. Streamflow forecasts for the Jun-July time period and Jun-Sept time period are forecasted to be well below average. The basin-wide average June-July streamflow forecast for the Jefferson River is currently at 54 percent of average, and 57 percent of last year.

## Jefferson River Basin Streamflow Forecasts - June 1, 2015

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

| JEFFERSON RIVER BASIN                    | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|--|-----------------|-----------|-----------|-----------|-------|-----------|-----------|----------------|
| Lima Reservoir Inflow <sup>2</sup>       | JUN-JUL         | 0.58      | 3.2       | 6.1       | 20%   | 11.6      | 19.8      | 31             |
|  | JUN-SEP         | 1         | 3.3       | 6.8       | 17%   | 13.9      | 24        | 39             |
| Clark Canyon Inflow <sup>2</sup>         | JUN-JUL         | -36       | -9.7      | 8.2       | 23%   | 26        | 52        | 35             |
|  | JUN-SEP         | -26       | 3.6       | 24        | 44%   | 44        | 74        | 55             |
| Beaverhead R at Barretts <sup>2</sup>    | JUN-JUL         | -42       | -3.8      | 22        | 45%   | 48        | 86        | 49             |
|  | JUN-SEP         | -38       | 11.6      | 45        | 60%   | 78        | 128       | 75             |
| Ruby R Reservoir Inflow <sup>2</sup>     | JUN-JUL         | 6.1       | 15        | 21        | 51%   | 27        | 36        | 41             |
|  | JUN-SEP         | 14.5      | 25        | 32        | 57%   | 40        | 50        | 56             |
| Big Hole R at Wisdom                     | JUN-JUL         | 1         | 10.1      | 25        | 54%   | 41        | 63        | 46             |
|  | JUN-SEP         | 1         | 12.4      | 30        | 58%   | 48        | 74        | 52             |
| Big Hole R nr Melrose                    | JUN-JUL         | 75        | 142       | 187       | 69%   | 230       | 300       | 270            |
|  | JUN-SEP         | 91        | 172       | 225       | 71%   | 280       | 365       | 315            |
| Jefferson R nr Twin Bridges <sup>2</sup> | JUN-JUL         | -4.2      | 101       | 173       | 54%   | 245       | 350       | 320            |
|  | JUN-SEP         | -10.1     | 124       | 215       | 61%   | 305       | 440       | 355            |
| Boulder R nr Boulder                     | JUN-JUL         | 13.5      | 20        | 25        | 78%   | 30        | 36        | 32             |
|  | JUN-SEP         | 9.6       | 18.8      | 25        | 68%   | 31        | 40        | 37             |
| Willow Ck Reservoir Inflow <sup>2</sup>  | JUN-JUL         | 1.8       | 4.9       | 7         | 67%   | 9.1       | 12.2      | 10.4           |
|  | JUN-SEP         | 1.4       | 5.6       | 8.5       | 68%   | 11.4      | 15.6      | 12.5           |
| Jefferson R nr Three Forks <sup>2</sup>  | JUN-JUL         | -17       | 88        | 166       | 47%   | 245       | 360       | 355            |
|  | JUN-SEP         | -35       | 99        | 194       | 47%   | 290       | 430       | 415            |

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

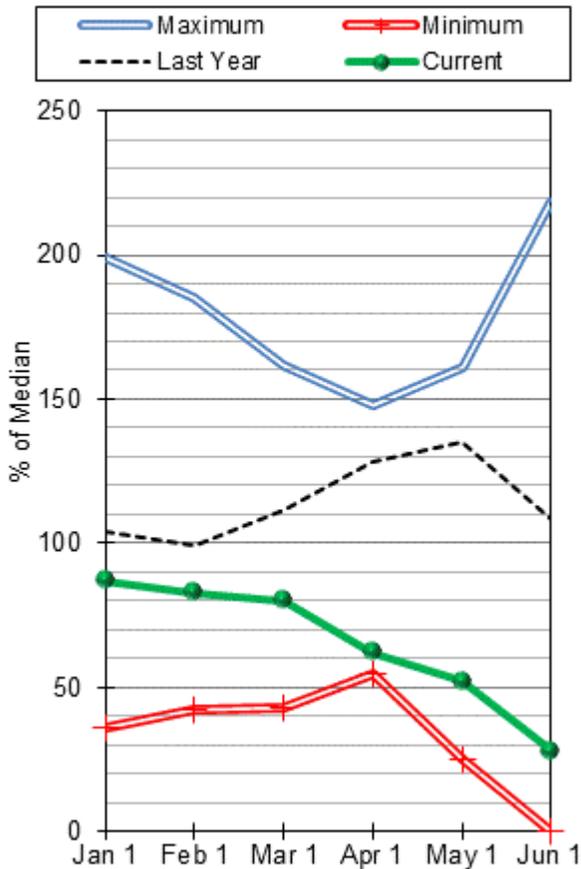
3) Median value used in place of average

| Reservoir Storage<br>End of May, 2015 | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---------------------------------------|---------------|-----------------|---------------|----------------|
| Lima Reservoir                        | 63.7          | 51.6            | 61.4          | 84.0           |
| Clark Canyon Res                      | 117.6         | 104.6           | 137.1         | 255.6          |
| Ruby River Reservoir                  | 37.6          | 37.6            | 37.1          | 38.8           |
| Basin-wide Total                      | 218.9         | 193.9           | 235.6         | 378.4          |
| # of reservoirs                       | 3             | 3               | 3             | 3              |

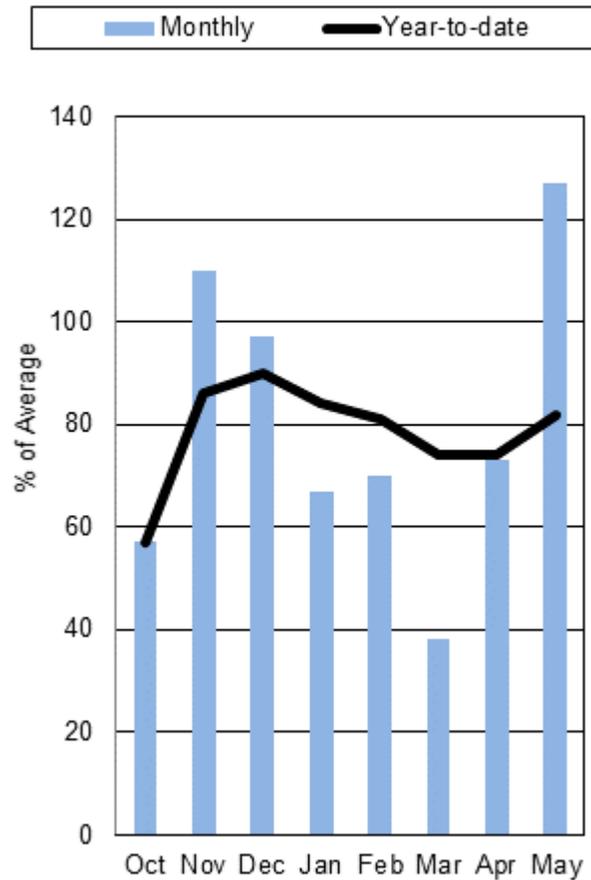
| Watershed Snowpack Analysis<br>June 1, 2015 | # of Sites | % Median | Last Year % Median |
|---|------------|----------|--------------------|
| BEAVERHEAD                                  | 8          | 59%      | 105%               |
| RUBY  | 5          | 55%      | 110%               |
| BIGHOLE                                     | 8          | 55%      | 139%               |
| BOULDER                                     | 3          | 39%      | 139%               |
| JEFFERSON RIVER BASIN                       | 19         | 52%      | 124%               |

# Madison River Basin

## Mountain Snowpack



## Precipitation



It finally became apparent in May that the snowpack in the Madison River basin would make no recovery from the well below normal conditions it has experienced all winter. On June 1<sup>st</sup> 6 of the 11 SNOTEL sites in the basin are melted out, and active melt is occurring at all sites. The more favorable cool and wet weather pattern came too late this year in the Madison River basin, but the change in weather did help to slow melt and conserve snowpack at higher elevations where snowpack persisted. Currently on June 1<sup>st</sup> the snowpack in basin is 28 percent of normal, and 26 percent of last year at this time.

After five straight months of below average precipitation the Madison River basin finally saw a return to more normal conditions, and received above average precipitation during the month. Valley weather stations received 152 percent of the average precipitation for May while mountain stations received 123 percent of average. Currently the Madison River basin is 82 percent of the water year-to-date average and 76 percent of last year at this time.

Basin-wide reservoir storage is at 111 percent of average and 114 percent of last year of last year at this time.

Snowpack driven streamflows are expected to be well below average for the June-July time period due to the well below normal snowpack this winter, and at this time. Streamflows during the last month have seen snowmelt contribution and runoff from precipitation during the month and are near average for this date. This is not expected to persist unless substantial precipitation falls throughout the summer. The basin-wide average June-July streamflow forecast for the Madison River is currently at 45 percent of average and 50 of last year.

## Madison River Basin Streamflow Forecasts - June 1, 2015

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

| MADISON RIVER BASIN                  | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|--------------------------------------|-----------------|-----------|-----------|-----------|-------|-----------|-----------|----------------|
| Hebgen Reservoir Inflow <sup>2</sup> | JUN-JUL         | 36        | 62        | 79        | 44%   | 96        | 122       | 178            |
|                                      | JUN-SEP         | 95        | 126       | 147       | 53%   | 168       | 199       | 280            |
| Ennis Reservoir Inflow <sup>2</sup>  | JUN-JUL         | 82        | 122       | 149       | 45%   | 176       | 215       | 330            |
|                                      | JUN-SEP         | 169       | 220       | 255       | 53%   | 285       | 335       | 485            |

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

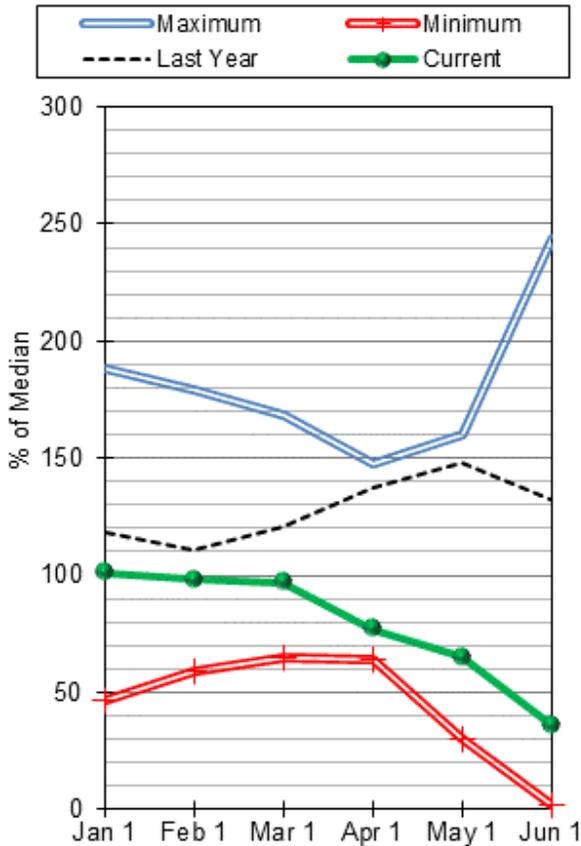
3) Median value used in place of average

| Reservoir Storage<br>End of May, 2015 | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---------------------------------------|---------------|-----------------|---------------|----------------|
| Ennis Lake                            | 36.9          | 32.9            | 35.6          | 41.0           |
| Hebgen Lake                           | 377.4         | 326.7           | 336.2         | 377.5          |
| Basin-wide Total                      | 414.4         | 359.5           | 371.8         | 418.5          |
| # of reservoirs                       | 2             | 2               | 2             | 2              |

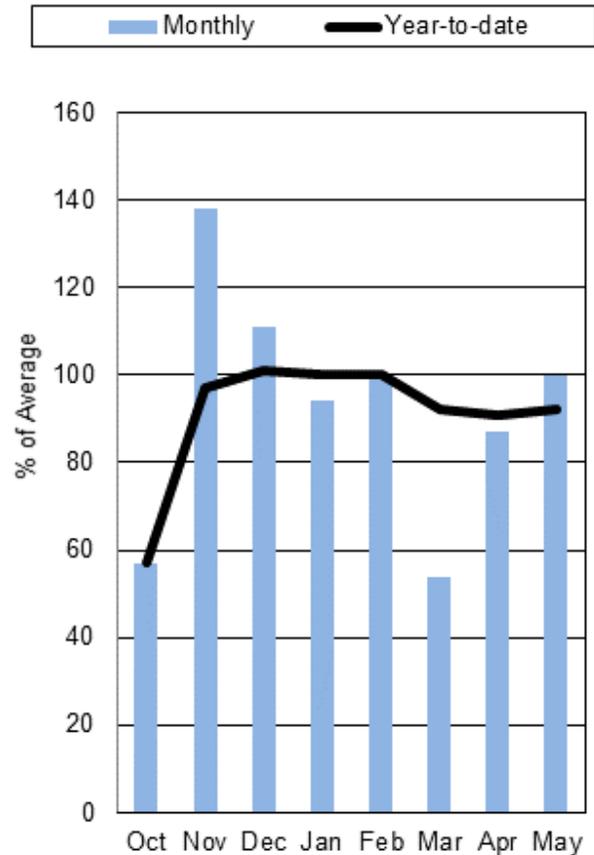
| Watershed Snowpack Analysis<br>June 1, 2015 | # of Sites | % Median | Last Year % Median |
|---|------------|----------|--------------------|
| MADISON abv HEBGEN LAKE                     | 4          | 3%       | 110%               |
| MADISON blw HEBGEN LAKE                     | 7          | 38%      | 108%               |
| MADISON RIVER BASIN                         | 11         | 28%      | 108%               |

# Gallatin River Basin

## Mountain Snowpack



## Precipitation



Snowpack in the Gallatin River basin reached peak snow water equivalent during the middle to late part of April and began melting shortly afterwards. A return to a more seasonal weather pattern during the middle of May did slow the melt at higher elevations, and even added some snow water to the melting snowpack. However, after unseasonably warm temperatures primed the snowpack for melt during March and April the snowpack continued the decline through the end of May. As of June 1<sup>st</sup>, 5 of the 7 SNOTEL sites in the basin have melted out and only high elevation sites continue to have snowpack. In relation to the peak snow water equivalent this year in the basin only 18 percent of the snowpack remains, and much of the snow water at SNOTEL elevations has entered the system. As of June 1<sup>st</sup>, the Gallatin River basin is currently 36 percent of normal for June 1<sup>st</sup>, and 27 percent of last year at this time.

Unlike the last few months, the Gallatin experienced near normal precipitation for the month of May. Valley weather stations received 115 percent of average precipitation during the month, while mountain locations received 97 percent. While this did help to bring the water year-to-date percentages up, the basin is still below average. Currently the Gallatin River basin is 92 percent of the water year-to-date average and 81 percent of last year at this time.

Middle Creek Reservoir is currently 118 percent of average and 128 percent of last year at this time.

Streamflows have been on the rise during the month of May due to the combination of snowmelt and precipitation during the month of May. On June 1<sup>st</sup> streamflows are near normal, but have been above normal for accumulated volume for the March 1<sup>st</sup> – June 1<sup>st</sup> time period. This indicates that snowmelt is occurring earlier than normal, and streamflows will be below average later during the summer period unless significant precipitation occurs. Basin-wide streamflow forecasts as of June 1<sup>st</sup> are well below average at 54 percent for the June-July period and 51 percent of last year.

## Gallatin River Basin Streamflow Forecasts - June 1, 2015

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

| GALLATIN RIVER BASIN                  | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|---------------------------------------|-----------------|-----------|-----------|-----------|-------|-----------|-----------|----------------|
| Gallatin R nr Gateway                 | JUN-JUL         | 82        | 117       | 140       | 55%   | 163       | 198       | 255            |
|                                       | JUN-SEP         | 118       | 160       | 189       | 59%   | 220       | 260       | 320            |
| Hyalite Reservoir Inflow <sup>2</sup> | JUN-JUL         | 8.5       | 10        | 11        | 85%   | 12        | 13.4      | 12.9           |
|                                       | JUN-SEP         | 10.3      | 12.2      | 13.5      | 86%   | 14.7      | 16.6      | 15.7           |
| Gallatin R at Logan                   | JUN-JUL         | 35        | 88        | 124       | 51%   | 160       | 215       | 245            |
|                                       | JUN-SEP         | 53        | 123       | 170       | 55%   | 215       | 285       | 310            |

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

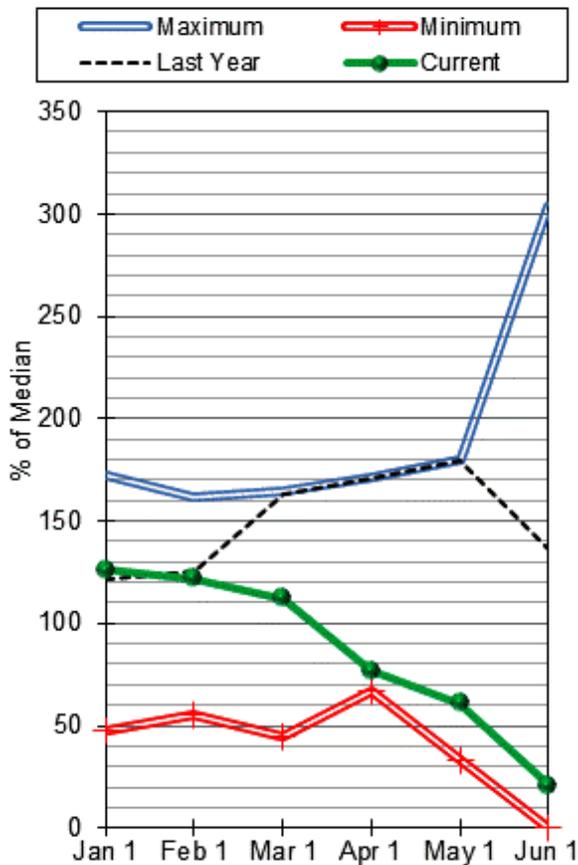
3) Median value used in place of average

| Reservoir Storage<br>End of May, 2015 | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---------------------------------------|---------------|-----------------|---------------|----------------|
| Middle Creek Res                      | 10.1          | 7.9             | 8.6           | 10.2           |
| Basin-wide Total                      | 10.1          | 7.9             | 8.6           | 10.2           |
| # of reservoirs                       | 1             | 1               | 1             | 1              |

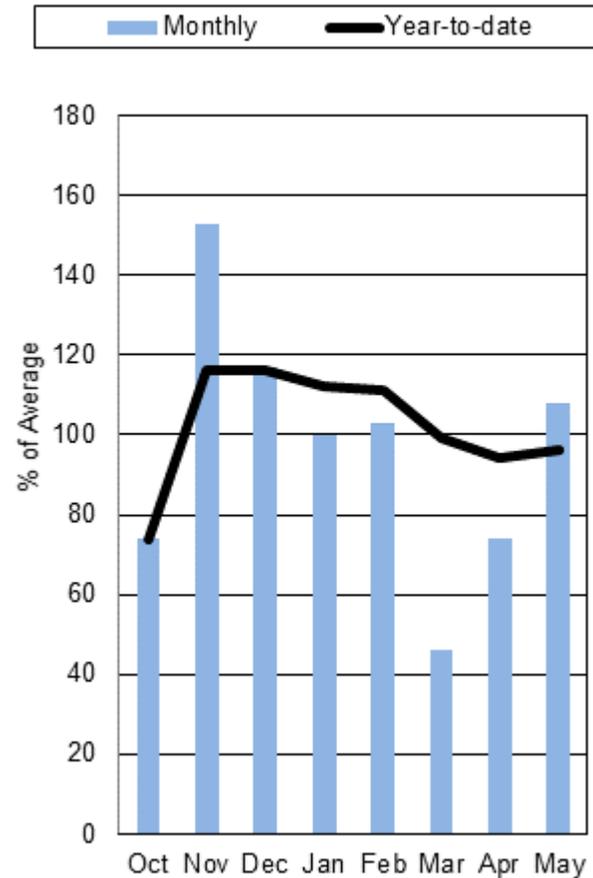
| Watershed Snowpack Analysis<br>June 1, 2015 | # of Sites | % Median | Last Year % Median |
|---|------------|----------|--------------------|
| UPPER GALLATIN                              | 3          | 24%      | 111%               |
| HYALITE                                     | 2          | 68%      | 149%               |
| BRIDGER                                     | 2          | 0%       | 290%               |
| GALLATIN RIVER BASIN                        | 7          | 36%      | 132%               |

# Missouri Headwaters Mainstem River Basin

## Mountain Snowpack



## Precipitation



In the early months of winter it looked like the Missouri Headwaters Mainstem basin below Totston, MT would have a decent runoff year from snowpack. Unfortunately, the lower elevation nature of the basin, lack of significant snowfall this spring, and above average temperatures resulted in significant declining percentage of normal snowpack after January 1<sup>st</sup>. This can be attributed to the significant melt experienced at low elevations in March, and transition of the remaining snowpack to melt in mid to late April. Currently, 3 of the 5 SNOTEL sites in the basin have melted out leaving only the highest of elevations with measureable snow on June 1<sup>st</sup>. The early melt and below normal peak snowpack will result in below average snowmelt contribution later this runoff season. Currently the basin-wide snowpack is 21 percent of normal for June 1<sup>st</sup>, and 15 percent of last year at this time.

The basin did receive near average precipitation during the month of May with valley weather stations receiving 98 percent of monthly average precipitation, and mountain SNOTEL sites receiving 99 percent. Currently on June 1<sup>st</sup>, the Missouri Headwaters Mainstem River basin is 96 percent of the water year-to-date average, and 86 percent of last year at this time.

Basin-wide reservoir storage is currently 115 percent of average for June 1<sup>st</sup>, and 112 percent of last year at this time.

Streamflow prospects for the June-July time period reflect well below normal snowpack in the basin, and early melt experienced so far. River basins feeding the mainstem of the Missouri River are similar in this regard and will produce below average streamflows. The basin-wide average June-July streamflow forecast on June 1<sup>st</sup> for the Missouri Mainstem River is currently at 48 percent of average and 41 percent of last year.

## Missouri Mainstem Basin Streamflow Forecasts - June 1, 2015

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

| MISSOURI MAINSTEM BASIN                  | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|--|-----------------|-----------|-----------|-----------|-------|-----------|-----------|----------------|
| Missouri R at Toston <sup>2</sup>        | JUN-JUL         | 23        | 240       | 390       | 41%   | 540       | 760       | 940            |
|  | JUN-SEP         | 65        | 365       | 570       | 47%   | 775       | 1080      | 1220           |
| Dearborn R nr Craig                      | JUN-JUL         | 1         | 10.3      | 20        | 50%   | 30        | 44        | 40             |
|  | JUN-SEP         | 3         | 13        | 24        | 52%   | 35        | 51        | 46             |
| Missouri R at Fort Benton <sup>2</sup>   | JUN-JUL         | 5         | 360       | 600       | 43%   | 840       | 1200      | 1410           |
|  | JUN-SEP         | 165       | 630       | 950       | 50%   | 1270      | 1740      | 1900           |
| Missouri R nr Virgelle <sup>2</sup>      | JUN-JUL         | 33        | 410       | 670       | 42%   | 930       | 1310      | 1600           |
|  | JUN-SEP         | 186       | 675       | 1010      | 48%   | 1340      | 1830      | 2120           |
| Missouri R nr Landusky <sup>2</sup>      | JUN-JUL         | 51        | 430       | 685       | 40%   | 940       | 1320      | 1710           |
|  | JUN-SEP         | 220       | 720       | 1060      | 47%   | 1400      | 1900      | 2260           |
| Missouri R bl Fort Peck Dam <sup>2</sup> | JUN-JUL         | 230       | 350       | 580       | 34%   | 900       | 1370      | 1710           |
|  | JUN-SEP         | 320       | 500       | 800       | 37%   | 1260      | 1950      | 2170           |
| Lake Sakakawea Inflow <sup>2</sup>       | JUN-JUL         | 1100      | 2250      | 3030      | 60%   | 3810      | 4960      | 5060           |
|  | JUN-SEP         | 855       | 2550      | 3710      | 60%   | 4860      | 6560      | 6150           |

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

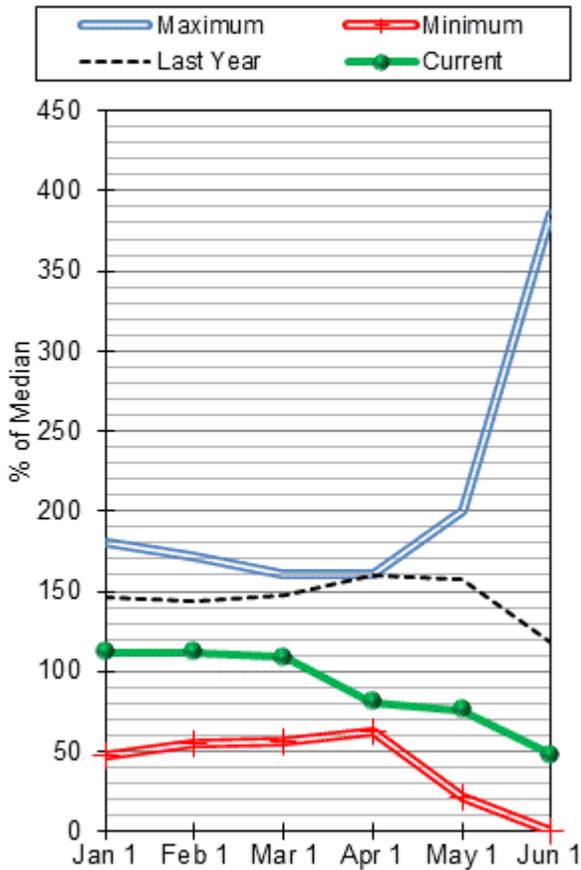
3) Median value used in place of average

| Reservoir Storage<br>End of May, 2015 | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---------------------------------------|---------------|-----------------|---------------|----------------|
| Canyon Ferry Lake                     | 1739.4        | 1519.5          | 1639.0        | 2043.0         |
| Helena Valley Reservoir               | 8.7           | 7.7             | 7.9           | 9.2            |
| Lake Helena                           | 10.9          | 10.9            | 10.9          | 12.7           |
| Hauser Lake & Lake Helena             | 74.0          | 74.0            | 73.8          | 74.6           |
| Holter Lake                           | 81.0          | 81.0            | 80.4          | 81.9           |
| Fort Peck Lake                        | 15428.1       | 13841.6         | 13383.0       | 18910.0        |
| Basin-wide Total                      | 17342.1       | 15534.7         | 15195.0       | 21131.4        |
| # of reservoirs                       | 6             | 6               | 6             | 6              |

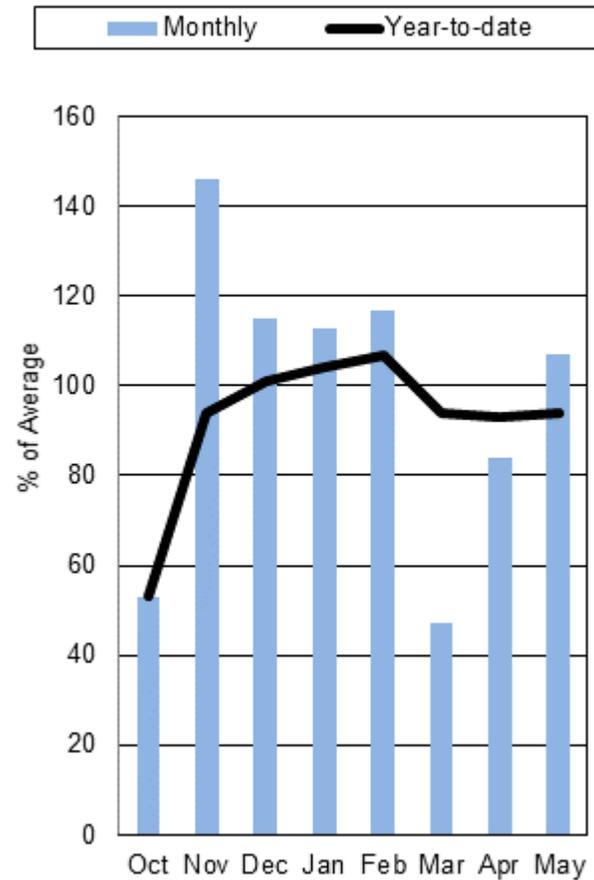
| Watershed Snowpack Analysis<br>June 1, 2015 | # of Sites | % Median | Last Year % Median |
|---|------------|----------|--------------------|
| HEADWATERS MAINSTEM                         | 5          | 21%      | 136%               |
| SMITH-JUDITH-MUSSELSHELL                    | 9          | 48%      | 118%               |
| SUN-TETON-MARIAS                            | 5          | 17%      | 189%               |
| MAINSTEM ab FT PECK RES                     | 18         | 33%      | 152%               |
| MILK RIVER BASIN                            | 3          |          |                    |
| MISSOURI MAINSTEM BASIN                     | 21         | 33%      | 152%               |

# Smith-Judith-Musselshell River Basins

## Mountain Snowpack



## Precipitation



Looking at the precipitation totals for mountain SNOTEL sites might indicate that snowpack should be near normal at this point in the Smith-Judith-Musselshell basin, as every month since November has been near to above average. The unfortunate reality is the early melt experienced at low elevations during the month of March, and melt at most elevations during April reduced the snowpack percentages. Snowmelt continued through the month of May leaving 6 of the 9 SNOTEL sites in the basin snow-free on June 1<sup>st</sup>. The return to cooler weather mid-month did help to add some snow water at some of the sites and slow the melt, but ultimately the basin returned to active melt by the end of the month. Currently on June 1<sup>st</sup> the basin is 48 percent of normal for this time, and 41 percent of last year.

The Smith-Judith-Musselshell is the one rare basin that has seen near normal mountain precipitation throughout the winter and spring, and May was no exception. Valley weather stations received 114 percent of monthly average precipitation, while mountain SNOTEL sites received 102 percent. Currently on June 1<sup>st</sup>, the Smith-Judith-Musselshell River Basin is 94 percent of the water year-to-date average, and 89 percent of last year at this time.

Basin-wide reservoir storage is currently at 148 percent of average, and 105 percent of last year at this time.

River flows experienced in the basin so far reflect the early melt of low elevations in March and transition to active melt in April. During May streamflows have been near normal on many of the rivers and streams, and the additional rainfall has helped to keep the streamflows in the normal range. The early passing of this water will have an impact on the streams later this summer, and above average precipitation will be needed to keep flows in this range. The basin-wide average June-July streamflow forecast for the Smith-Judith-Musselshell Rivers is 52 percent of average and 44 percent of last year.

**Smith-Judith-Musselshell  
Streamflow Forecasts - June 1, 2015**

|   |
|---|
| Forecast Exceedance Probabilities for Risk Assessment<br>Chance that actual volume will exceed forecast |
|---|

| <b>SMITH-JUDITH-MUSSEL SHELL</b>        | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|---|-----------------|-----------|-----------|-----------|-------|-----------|-----------|----------------|
| Sheep Ck nr White Sulphur Springs       | JUN-JUL         | 2.5       | 4.7       | 6.2       | 77%   | 7.7       | 9.9       | 8.1            |
|   | JUN-SEP         | 3.6       | 6.6       | 8.6       | 79%   | 10.6      | 13.6      | 10.9           |
| Smith R bl Eagle Ck <sup>2</sup>        | JUN-JUL         | 10        | 18        | 32        | 59%   | 45        | 65        | 54             |
|   | JUN-SEP         | 12        | 24        | 42        | 65%   | 61        | 88        | 65             |
| NF Musselshell R nr Delpine             | JUN-JUL         | 0.2       | 0.5       | 1.6       | 80%   | 2.7       | 4.4       | 2              |
|   | JUN-SEP         | 0.4       | 1.42      | 2.4       | 86%   | 3.4       | 4.8       | 2.8            |
| SF Musselshell R ab Martinsdale         | JUN-JUL         | 0.5       | 1.97      | 9.6       | 48%   | 17.2      | 28        | 20             |
|   | JUN-SEP         | 1         | 4.6       | 12.7      | 55%   | 21        | 33        | 23             |
| Musselshell R at Harlowton <sup>2</sup> | JUN-JUL         | -9        | -2.6      | 15.2      | 54%   | 33        | 59        | 28             |
|   | JUN-SEP         | -7        | 2.6       | 20        | 67%   | 38        | 65        | 30             |
| Musselshell R nr Roundup <sup>2</sup>   | JUN-JUL         | 0         | 4         | 10.8      | 32%   | 28        | 53        | 34             |
|   | JUN-SEP         | 0         | 5         | 13.7      | 40%   | 31        | 56        | 34             |

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

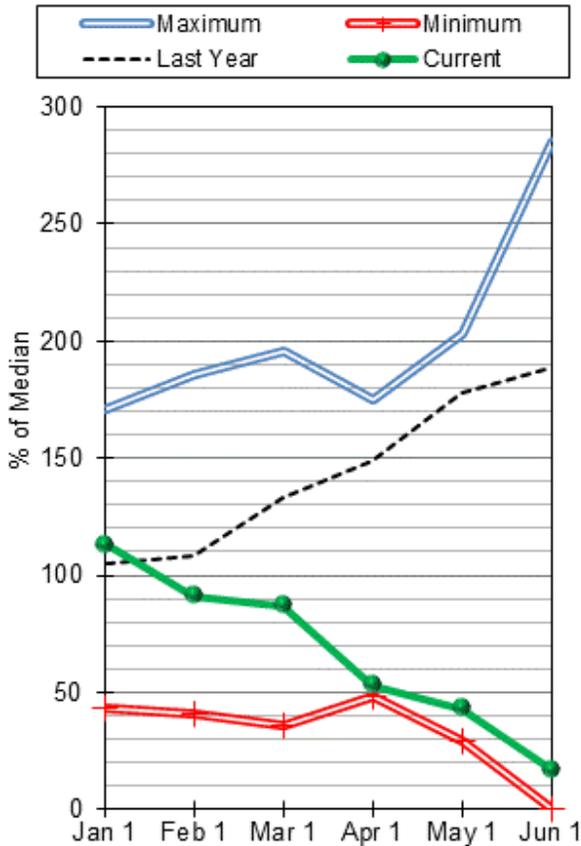
3) Median value used in place of average

| <b>Reservoir Storage<br/>End of May, 2015</b> | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---|---------------|-----------------|---------------|----------------|
| Smith River Res                               | 11.6          | 11.6            | 9.9           | 10.6           |
| Ackley Lake                                   | 6.6           | 4.6             | 4.6           | 7.0            |
| Bair Res                                      | 7.5           | 7.3             | 4.9           | 7.0            |
| Martinsdale Res                               | 23.2          | 19.8            | 15.2          | 23.1           |
| Deadman's Basin Res                           | 75.3          | 74.7            | 49.2          | 72.2           |
| Basin-wide Total                              | 124.1         | 117.9           | 83.8          | 119.9          |
| # of reservoirs                               | 5             | 5               | 5             | 5              |

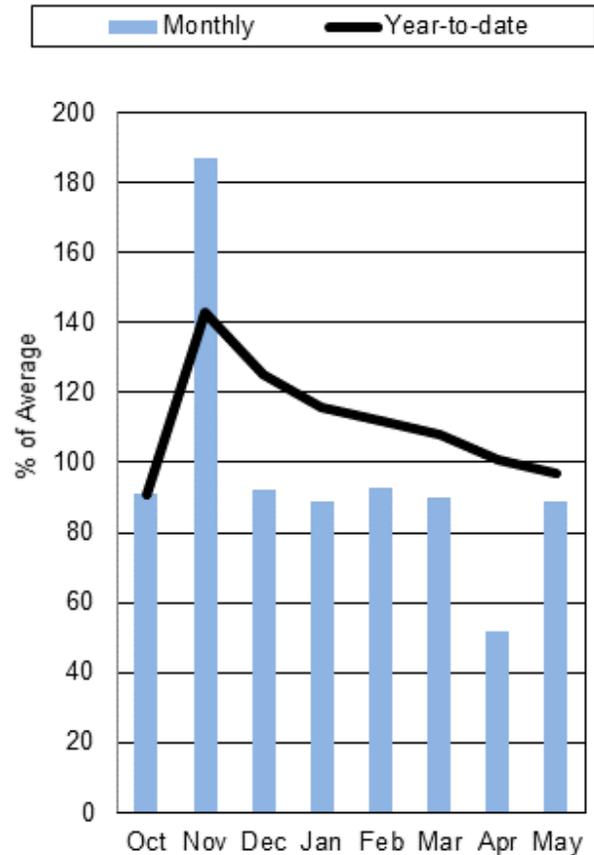
| <b>Watershed Snowpack Analysis<br/>June 1, 2015</b> | # of Sites | % Median | Last Year % Median |
|---|------------|----------|--------------------|
| SMITH   | 6          | 44%      | 116%               |
| HIGHWOOD  | 0          |          |                    |
| JUDITH  | 4          | 85%      | 129%               |
| MUSSELSHELL   | 2          |          |                    |
| SMITH-JUDITH-MUSSELSHELL                            | 9          | 48%      | 118%               |

# Sun-Teton-Marias River Basins

## Mountain Snowpack



## Precipitation



Since February 1<sup>st</sup> the Sun-Teton-Marias River basin has been below normal in regards to snowpack. Low elevation SNOTEL sites made the transition to melt during the middle of March, with the Dupuyer Creek SNOTEL site setting a new record early melt-out date of March 28<sup>th</sup>. Two low to mid-elevation SNOTEL sites were able to prolong their snowpack into April, but had melted out by May 1<sup>st</sup> (Waldron SNOTEL, Wood Creek SNOTEL) Higher elevation SNOTEL sites began active melt after the middle half of April and had snowpack that persisted into May late May. Currently only one high elevation SNOTEL site (Badger Pass) has snow on June 1<sup>st</sup>. The persistently dry and abnormally warm weather pattern this winter and spring resulted in early melt in the basin, limiting the amount of snow water to enter the rivers and streams as we progress into summer. Currently on June 1<sup>st</sup> the basin is 17 percent of normal for this time, and 9 percent of last year at this time.

Valley weather stations received 102 percent of monthly average precipitation for May, while mountain SNOTEL sites received 83 percent. Currently on June 1<sup>st</sup>, the Sun-Teton-Marias River Basin is 97 percent of the water year-to-date average, and 96 percent of last year at this time.

Basin-wide reservoir storage is currently at 111 percent of average, and 110 percent of last year at this time.

Streamflows in through the months of March and April were in the above normal to well above normal range in the basin, indicating the early passage of snow water through the systems. The well below normal snowpack on June 1<sup>st</sup> indicates that streamflow during the June-July time period could be well below average. The basin-wide average June-July streamflow forecast for the Sun-Teton-Marias Rivers on June 1<sup>st</sup> is currently 44 percent of average and 29 percent of last year.

**Sun-Teton-Marias**  
**Streamflow Forecasts - June 1, 2015**

|   |
|---|
| Forecast Exceedance Probabilities for Risk Assessment<br>Chance that actual volume will exceed forecast |
|---|

| <b>SUN-TETON-MARIAS</b>                 | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|---|-----------------|-----------|-----------|-----------|-------|-----------|-----------|----------------|
| Gibson Reservoir Inflow                 | JUN-JUL         | 68        | 100       | 122       | 58%   | 144       | 176       | 210            |
|   | JUN-SEP         | 105       | 140       | 163       | 65%   | 186       | 220       | 250            |
| Two Medicine R nr Browning <sup>2</sup> | JUN-JUL         | 19.9      | 34        | 43        | 52%   | 52        | 66        | 82             |
|   | JUN-SEP         | 22        | 37        | 48        | 51%   | 59        | 74        | 94             |
| Badger Ck nr Browning                   | JUN-JUL         | 1.41      | 11.4      | 18.2      | 40%   | 25        | 35        | 46             |
|   | JUN-SEP         | 9         | 21        | 29        | 48%   | 37        | 49        | 61             |
| Swift Reservoir Inflow <sup>2</sup>     | JUN-JUL         | 4.3       | 10.4      | 14.5      | 48%   | 18.6      | 25        | 30             |
|   | JUN-SEP         | 10.7      | 18.4      | 24        | 59%   | 29        | 37        | 41             |
| Dupuyer Ck nr Valier                    | JUN-JUL         | 0.4       | 0.8       | 1.1       | 20%   | 4.2       | 8.6       | 5.4            |
|   | JUN-SEP         | 0.8       | 1.6       | 2.1       | 30%   | 5.7       | 11.1      | 6.9            |
| Cut Bank Ck nr Browning                 | JUN-JUL         | 7.8       | 15.6      | 21        | 55%   | 26        | 34        | 38             |
|   | JUN-SEP         | 10.5      | 19.1      | 25        | 57%   | 31        | 39        | 44             |
| Marias R nr Shelby <sup>2</sup>         | JUN-JUL         | -30       | -5        | 24        | 17%   | 68        | 134       | 143            |
|   | JUN-SEP         | -30       | -5        | 25        | 16%   | 76        | 150       | 158            |
| Teton R nr Dutton                       | JUN-JUL         | 0.8       | 3.2       | 8         | 33%   | 21        | 39        | 24             |
|   | JUN-SEP         | 1         | 5.1       | 12.8      | 44%   | 28        | 50        | 29             |

1) 90% and 10% exceedance probabilities are actually 95% and 5%

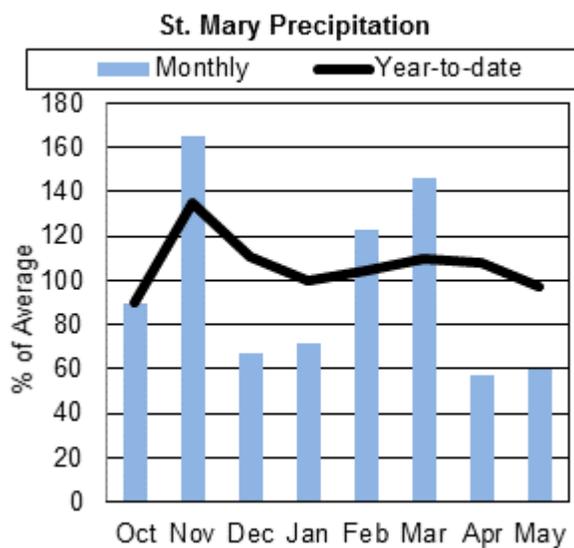
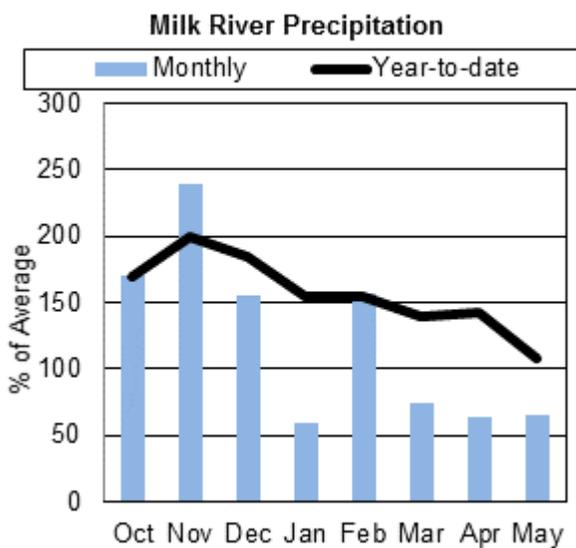
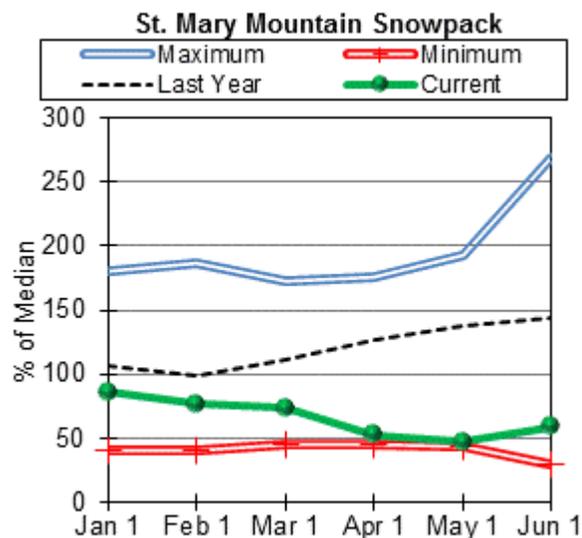
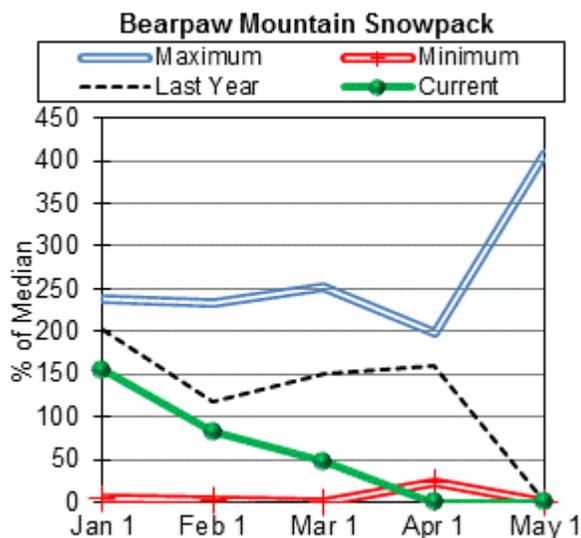
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

3) Median value used in place of average

| <b>Reservoir Storage<br/>End of May, 2015</b> | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---|---------------|-----------------|---------------|----------------|
| Gibson Res                                    | 98.5          | 82.4            | 89.8          | 99.1           |
| Pishkun Res                                   | 30.4          | 30.0            | 29.8          | 32.0           |
| Willow Creek Res - Augusta                    | 31.5          | 30.0            | 28.3          | 32.2           |
| Lower Two Medicine Lake                       | 12.5          | 12.6            | 12.0          | 11.9           |
| Four Horns Lake                               | 12.5          | 11.2            | 11.6          | 19.2           |
| Swift Res                                     | 24.8          | 12.0            | 23.1          | 30.0           |
| Lake Frances                                  | 83.9          | 75.6            | 73.9          | 112.0          |
| Lake Elwell (Tiber)                           | 881.6         | 823.0           | 796.1         | 1347.0         |
| Nilan Reservoir                               | 11.0          | 10.7            | 8.5           | 0.0            |
| Basin-wide Total                              | 1186.5        | 1087.5          | 1073.1        | 1683.4         |
| # of reservoirs                               | 9             | 9               | 9             | 9              |

| <b>Watershed Snowpack Analysis<br/>June 1, 2015</b> | # of Sites | % Median | Last Year % Median |
|---|------------|----------|--------------------|
| SUN   | 2          | 0%       | 287%               |
| TETON   | 3          | 0%       | 287%               |
| MARIAS  | 2          | 21%      | 164%               |
| SUN-TETON-MARIAS                                    | 5          | 17%      | 189%               |

## St. Mary and Milk River Basins



Like its southerly neighbor the Sun-Teton-Marias, the St. Mary-Milk River basin has been below normal in terms on snowpack all water year. Low elevation sites in Glacier National Park (Many Glacier SNOTEL) and in the Bearpaw Mountains (Rocky Boy SNOTEL) were snow free by the end of March due to the melt experienced from above normal temperatures this winter. The higher elevation site in the basin (Flattop Mountain SNOTEL 6300') still has 48 percent of peak snow water left to melt. The Flattop Mountain site made the transition to melt during mid-April and has been in active melt since mid-May. The loss of the lower elevation snowpack and below normal peak accumulation will result in below average snowmelt contribution to streamflows this summer. Currently on June 1<sup>st</sup> the basin is 59 percent of normal for this time, and 41 percent of last year at this time.

Valley weather stations received 65 percent of monthly average precipitation for May, while mountain SNOTEL sites received 55 percent. Currently on June 1<sup>st</sup>, the Saint-Mary-Milk River Basin is 97 percent of the water year-to-date average, and 101 percent of last year at this time.

Basin-wide reservoir storage is currently at 128 percent of average, and 125 percent of last year at this time.

Early snowmelt and below normal peak snow accumulation this year should result in below average streamflows this summer. The basin-wide average June-July streamflow forecast for the Saint Mary-Milk River is currently at 55 percent of average and 36 percent of last year.

## St. Mary & Milk Basins Streamflow Forecasts - June 1, 2015

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

| ST. MARY & MILK BASINS                       | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|--|-----------------|-----------|-----------|-----------|-------|-----------|-----------|----------------|
| Lake Sherburne Inflow                        | JUN-JUL         | 17.1      | 25        | 30        | 54%   | 35        | 43        | 56             |
|  | JUN-SEP         | 29        | 37        | 44        | 62%   | 50        | 59        | 71             |
| St. Mary R nr Babb <sup>2</sup>              | JUN-JUL         | 81        | 112       | 132       | 56%   | 152       | 183       | 235            |
|  | JUN-SEP         | 114       | 148       | 171       | 58%   | 195       | 230       | 295            |
| St. Mary R at Intl Boundary <sup>2</sup>     | JUN-JUL         | 78        | 120       | 148       | 54%   | 176       | 220       | 275            |
|  | JUN-SEP         | 114       | 161       | 192       | 56%   | 225       | 270       | 345            |
| Milk R at Western Crossing of Intl Bndry, AB | JUN-JUL         | 0.1       | 1.8       | 4.5       | 71%   | 12.5      | 24        | 6.3            |
|  | JUN-SEP         | 0.2       | 2.2       | 5.7       | 80%   | 14.8      | 28        | 7.1            |
| Milk R at Eastern Crossing of Intl Bndry     |                 |           |           |           |       |           |           |                |

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

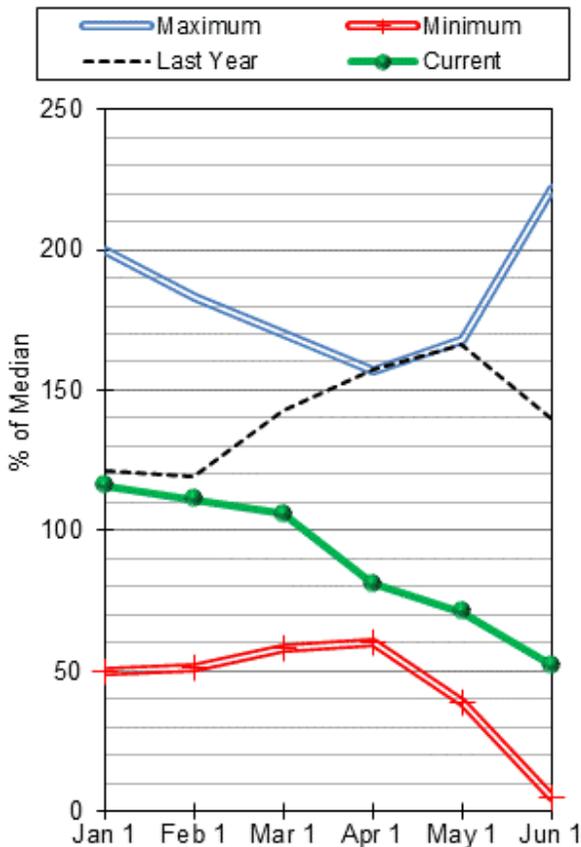
3) Median value used in place of average

| Reservoir Storage<br>End of May, 2015 | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---------------------------------------|---------------|-----------------|---------------|----------------|
| Lake Sherburne                        | 50.2          | 47.1            | 31.8          | 64.3           |
| Fresno Res                            | 76.5          | 78.1            | 71.9          | 127.0          |
| Nelson Res                            | 56.5          | 56.0            | 40.0          | 66.8           |
| Basin-wide Total                      | 183.2         | 181.2           | 143.7         | 258.1          |
| # of reservoirs                       | 3             | 3               | 3             | 3              |

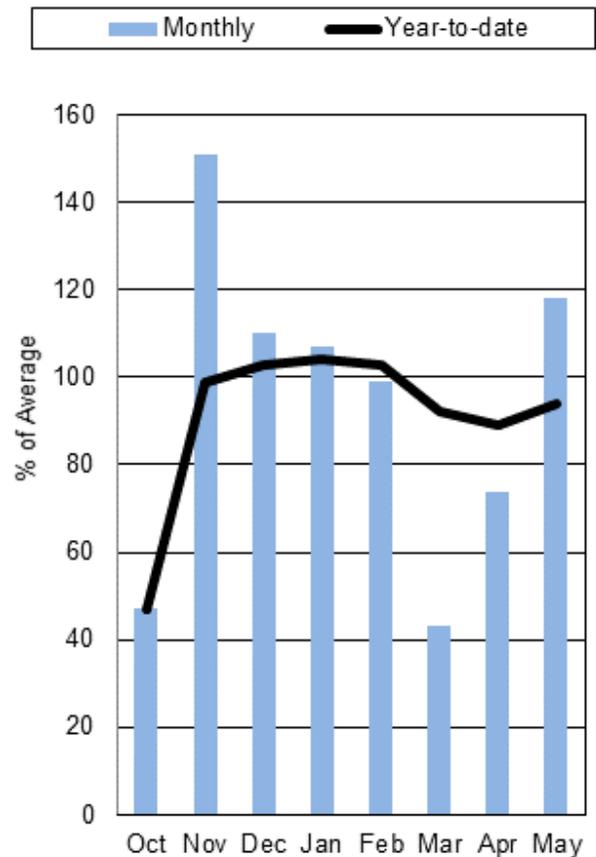
| Watershed Snowpack Analysis<br>June 1, 2015 | # of Sites | % Median | Last Year % Median |
|---|------------|----------|--------------------|
| ST. MARY                                    | 2          | 59%      | 144%               |
| BEARPAW MOUNTAINS                           | 3          |          |                    |
| CYPRESS HILLS, CANADA                       | 0          |          |                    |
| MILK RIVER BASIN                            | 3          |          |                    |
| ST. MARY & MILK BASINS                      | 5          | 59%      | 144%               |

# Upper Yellowstone River Basin

## Mountain Snowpack



## Precipitation



As this year’s abundantly warm and dry April weather transitioned into May in the Upper Yellowstone River basin, it appeared that all snow would melt early and the basin would have new record low snowpack numbers. On May 5<sup>th</sup>, the basin wide snow water equivalent was 58 percent of average and 1.8 inches away from the lowest number on record. Fortunately, cooler weather arrived and several snow storms graced the region on May 8<sup>th</sup>, which helped sustain the snowpack through mid-month. The last week of the month dealt the basin its most significant loss of the season with average of 0.4 inches of snow water per day. Much of this loss can be attributed to significant rain which fell at all elevations. The Upper Yellowstone River basin is currently at 52 percent of normal snowpack for June 1<sup>st</sup>, and 37 percent of last year at this time.

Valley weather stations received 153 percent of monthly average precipitation for May, while mountain SNOTEL sites received 104 percent. Overall, the basin received 118 percent of its monthly average. Currently on June 1<sup>st</sup>, the Upper Yellowstone River basin is at 94 percent of the water year-to-date average and 77 percent of last year at this time.

Basin-wide reservoir storage is currently at 111 percent of average, and 108 percent of last year at this time.

Overall, the Upper Yellowstone River basin saw its largest deviation from normal with above normal streamflows following the melt that occurred during the warm and sunny weather at the end of April. After around May 10<sup>th</sup> most streamflows in the basin was near normal. Compared to many basins in the state the Upper Yellowstone has more high elevation left to melt, but like many other basins has experienced significant losses of SWE at mid to low elevations. This early movement of water likely result in below average streamflows later in the runoff season. Basin-wide average June-July streamflow forecast for the Upper Yellowstone River is currently 68 percent of average and 50 percent of last year.

## Upper Yellowstone River Basin Streamflow Forecasts - June 1, 2015

Forecast Exceedance Probabilities for Risk Assessment  
Chance that actual volume will exceed forecast

| UPPER YELLOWSTONE RIVER BASIN            | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|--|-----------------|-----------|-----------|-----------|-------|-----------|-----------|----------------|
| Yellowstone R at Yellowstone Lake Outlet | JUN-JUL         | 153       | 199       | 230       | 49%   | 260       | 305       | 465            |
|  | JUN-SEP         | 210       | 275       | 320       | 49%   | 365       | 430       | 655            |
| Yellowstone R at Corwin Springs          | JUN-JUL         | 450       | 570       | 655       | 63%   | 740       | 860       | 1040           |
|  | JUN-SEP         | 580       | 745       | 855       | 64%   | 965       | 1130      | 1330           |
| Yellowstone R at Livingston              | JUN-JUL         | 505       | 650       | 755       | 64%   | 855       | 1000      | 1180           |
|  | JUN-SEP         | 665       | 860       | 990       | 65%   | 1120      | 1320      | 1520           |
| Shields R nr Livingston                  | JUN-JUL         | 2         | 10.4      | 31        | 50%   | 52        | 82        | 62             |
|  | JUN-SEP         | 4         | 14.5      | 39        | 51%   | 64        | 100       | 76             |
| Boulder R at Big Timber                  | JUN-JUL         | 102       | 129       | 148       | 74%   | 167       | 194       | 200            |
|  | JUN-SEP         | 106       | 140       | 163       | 72%   | 186       | 220       | 225            |
| Mystic Lake Inflow <sup>2</sup>          | JUN-JUL         | 33        | 37        | 40        | 85%   | 43        | 48        | 47             |
|  | JUN-SEP         | 44        | 50        | 55        | 87%   | 59        | 66        | 63             |
| Stillwater R nr Absarokee <sup>2</sup>   | JUN-JUL         | 230       | 265       | 295       | 91%   | 320       | 355       | 325            |
|  | JUN-SEP         | 275       | 330       | 365       | 91%   | 400       | 455       | 400            |
| Clarks Fk Yellowstone R nr Belfry        | JUN-JUL         | 235       | 275       | 300       | 86%   | 325       | 365       | 350            |
|  | JUN-SEP         | 245       | 295       | 330       | 84%   | 360       | 410       | 395            |
| Cooney Reservoir Inflow                  | JUN-JUL         | 9.7       | 16.2      | 21        | 95%   | 25        | 32        | 22             |
|  | JUN-SEP         | 17        | 25        | 30        | 97%   | 36        | 44        | 31             |
| Yellowstone R at Billings                | JUN-JUL         | 975       | 1320      | 1550      | 71%   | 1780      | 2120      | 2170           |
|  | JUN-SEP         | 1130      | 1590      | 1900      | 71%   | 2220      | 2680      | 2660           |

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

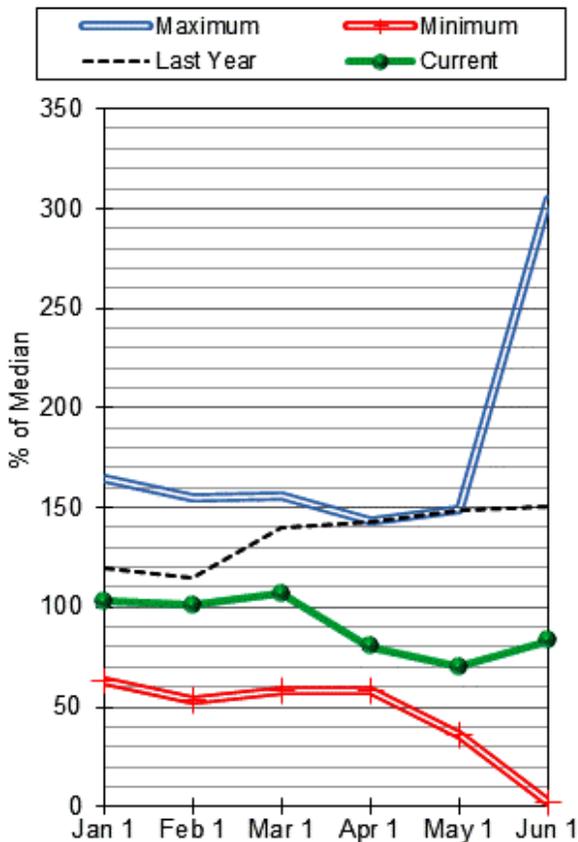
3) Median value used in place of average

| Reservoir Storage<br>End of May, 2015 | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---------------------------------------|---------------|-----------------|---------------|----------------|
| Mystic Lake                           | 4.2           | 7.8             | 5.8           | 21.0           |
| Cooney Res                            | 28.5          | 22.6            | 23.7          | 27.4           |
| Basin-wide Total                      | 32.7          | 30.4            | 29.5          | 48.4           |
| # of reservoirs                       | 2             | 2               | 2             | 2              |

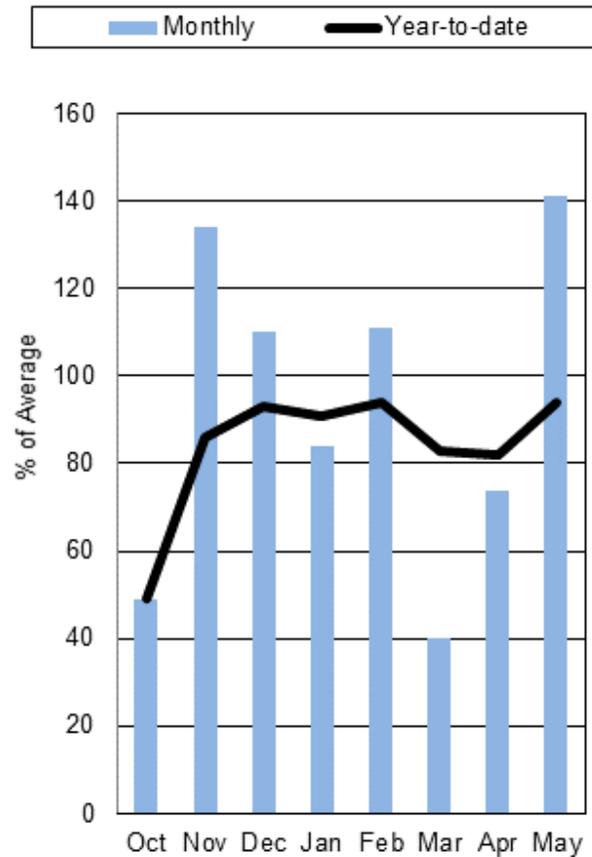
| Watershed Snowpack Analysis<br>June 1, 2015 | # of Sites | % Median | Last Year % Median |
|---|------------|----------|--------------------|
| YELLOWSTONE ab LIVINGSTON                   | 9          | 55%      | 136%               |
| SHIELDS                                     | 4          | 0%       | 162%               |
| BOULDER-STILLWATER                          | 3          | 48%      | 116%               |
| RED LODGE-ROCK CREEK                        | 2          | 130%     | 183%               |
| CLARK'S FORK                                | 7          | 58%      | 147%               |
| UPPER YELLOWSTONE RIVER BASIN               | 22         | 52%      | 140%               |

# Lower Yellowstone River Basin

### Mountain Snowpack



### Precipitation



After having reached its lowest basin wide snowpack numbers on record in mid-April the Lower Yellowstone River basin had a substantial comeback over the month. On May 7<sup>th</sup>, after losing 3.3 inches of basin wide snow water over 10 days, a storm arrived that favored the region adding 0.8 inches of snow water equivalent. Mid to late month the basin saw below average melt and another major snow storm that blanketed Wyoming. On May 23<sup>rd</sup>, Cloud Peak Reservoir SNOTEL (Elev. 9860) received a storm that dropped 20 inches of snow depth. While a significant spring event, the snowpack in the basin peaked this year well below normal and will provide below average snowmelt runoff this summer. Overall, the Lower Yellowstone River basin is currently at 83 percent of normal snowpack and 54 percent of last year at this time.

Valley weather stations received 95 percent of monthly average precipitation for May, while mountain SNOTEL sites received 166 percent. Overall, the basin received 141 percent of its monthly average. Currently on June 1<sup>st</sup>, the Upper Yellowstone River basin is 94 percent of the water year-to-date average and 82 percent of last year at this time.

Basin-wide reservoir storage is currently at 115 percent of average, and 124 percent of last year at this time.

Lower Yellowstone River basin streamflows remained normal to above normal for the majority of May, until the storm system landed in Wyoming around May 23<sup>rd</sup>. After Around May 27<sup>th</sup> a large portion of streamflows in the Bighorn and Southern Wind River Ranges reached much above normal stream flows. The early movement of snow water will translate to below average flows later this runoff season. The basin-wide average June-July streamflow forecast for the Lower Yellowstone River is currently 77 percent of average and 53 percent of last year.

**Lower Yellowstone River Basin (Wyoming)  
Streamflow Forecasts - June 1, 2015**

|   |
|---|
| Forecast Exceedance Probabilities for Risk Assessment<br>Chance that actual volume will exceed forecast |
|---|

| <b>LOWER YELLOWSTONE RIVER BASIN (Wyoming)</b> | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Avg | 30% (KAF) | 10% (KAF) | 30yr Avg (KAF) |
|--|-----------------|-----------|-----------|-----------|-------|-----------|-----------|----------------|
| Bighorn R nr St. Xavier <sup>2</sup>           | JUN-JUL         | 420       | 605       | 730       | 79%   | 855       | 1040      | 920            |
|  | JUN-SEP         | 405       | 645       | 810       | 80%   | 975       | 1210      | 1010           |
| Little Bighorn R nr Hardin                     | JUN-JUL         | 19.9      | 37        | 49        | 92%   | 60        | 77        | 53             |
|  | JUN-SEP         | 26        | 47        | 60        | 91%   | 74        | 94        | 66             |
| Tongue R nr Dayton <sup>2</sup>                | JUN-JUL         | 27        | 37        | 43        | 88%   | 49        | 59        | 49             |
|  | JUN-SEP         | 36        | 47        | 55        | 89%   | 63        | 74        | 62             |
| Big Goose Ck nr Sheridan                       | JUN-JUL         | 21        | 26        | 30        | 97%   | 34        | 39        | 31             |
|  | JUN-SEP         | 26        | 32        | 36        | 92%   | 40        | 45        | 39             |
| Little Goose Ck nr Bighorn                     | JUN-JUL         | 13.3      | 16.1      | 18        | 94%   | 19.9      | 23        | 19.1           |
|  | JUN-SEP         | 19.5      | 23        | 26        | 96%   | 29        | 32        | 27             |
| Tongue River Reservoir Inflow <sup>2</sup>     | JUN-JUL         | 53        | 79        | 97        | 88%   | 115       | 142       | 110            |
|  | JUN-SEP         | 63        | 96        | 118       | 88%   | 141       | 174       | 134            |
| Yellowstone R at Miles City <sup>2</sup>       | JUN-JUL         | 1520      | 2040      | 2400      | 75%   | 2750      | 3280      | 3200           |
|  | JUN-SEP         | 1650      | 2390      | 2900      | 75%   | 3400      | 4140      | 3870           |
| Powder R at Moorehead                          | JUN-JUL         | 37        | 69        | 91        | 99%   | 113       | 145       | 92             |
|  | JUN-SEP         | 48        | 87        | 114       | 104%  | 141       | 180       | 110            |
| Powder R nr Locate                             | JUN-JUL         | 30        | 72        | 101       | 100%  | 130       | 173       | 101            |
|  | JUN-SEP         | 36        | 90        | 127       | 104%  | 163       | 215       | 122            |
| Yellowstone R nr Sidney <sup>2</sup>           | JUN-JUL         | 1390      | 2000      | 2420      | 75%   | 2840      | 3460      | 3240           |
|  | JUN-SEP         | 1380      | 2250      | 2840      | 74%   | 3430      | 4300      | 3840           |

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

3) Median value used in place of average

| <b>Reservoir Storage<br/>End of May, 2015</b> | Current (KAF) | Last Year (KAF) | Average (KAF) | Capacity (KAF) |
|---|---------------|-----------------|---------------|----------------|
| Bighorn Lake                                  | 950.2         | 750.5           | 848.0         | 1356.0         |
| Tongue River Res                              | 83.4          | 83.5            | 52.6          | 79.1           |
| Basin-wide Total                              | 1033.6        | 834.0           | 900.6         | 1435.1         |
| # of reservoirs                               | 2             | 2               | 2             | 2              |

| <b>Watershed Snowpack Analysis<br/>June 1, 2015</b> | # of Sites | % Median | Last Year % Median |
|---|------------|----------|--------------------|
| WIND RIVER (Wyoming)                                | 10         | 119%     | 115%               |
| SHOSHONE RIVER (Wyoming)                            | 4          | 48%      | 135%               |
| BIGHORN RIVER (Wyoming)                             | 14         | 54%      | 146%               |
| LITTLE BIGHORN (Wyoming)                            | 2          | 61%      | 195%               |
| TONGUE RIVER (Wyoming)                              | 6          | 85%      | 182%               |
| POWDER RIVER (Wyoming)                              | 6          | 231%     | 292%               |
| LOWER YELLOWSTONE RIVER BASIN (Wyoming)             | 29         | 83%      | 153%               |

## Montana Site Report

| Site               | Network | Elevation<br>(ft) | Depth<br>(in) | SWE<br>(in) | Median<br>(in) | %<br>Median | Last Year<br>SWE (in) | Last Year<br>% Median |
|--------------------|---------|-------------------|---------------|-------------|----------------|-------------|-----------------------|-----------------------|
| Albro Lake         | SNOTEL  | 8300              | 18            | 9.0         | 12.2           | 74%         | 15.2                  | 125%                  |
| Ambrose            | SC      | 6480              |               |             |                |             |                       |                       |
| Arch Falls         | SC      | 7350              |               |             |                |             |                       |                       |
| Ashley Divide      | SC      | 4820              |               |             |                |             |                       |                       |
| Badger Pass        | SNOTEL  | 6900              | 5             | 3.6         | 17.2           | 21%         | 28.2                  | 164%                  |
| Banfield Mountain  | SNOTEL  | 5600              | 0             | 0.0         | 0.0            |             | 1.2                   |                       |
| Baree Creek        | SC      | 5500              |               |             |                |             |                       |                       |
| Baree Midway       | SC      | 4600              |               |             |                |             |                       |                       |
| Baree Trail        | SC      | 3800              |               |             |                |             |                       |                       |
| Barker Lakes       | SNOTEL  | 8250              | 17            | 6.7         | 11.0           | 61%         | 13.9                  | 126%                  |
| Basin Creek        | SNOTEL  | 7180              | 0             | 0.0         | 0.3            | 0%          | 0.0                   | 0%                    |
| Bassoo Peak        | SC      | 5150              |               |             |                |             |                       |                       |
| Beagle Springs     | SNOTEL  | 8850              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Bear Basin         | SC      | 8150              |               |             |                |             |                       |                       |
| Bear Mountain      | SNOTEL  | 5400              | 0             | 0.0         | 26.7           | 0%          | 42.6                  | 160%                  |
| Beartooth Lake     | SNOTEL  | 9360              | 41            | 15.5        | 17.1           | 91%         | 27.3                  | 160%                  |
| Beaver Creek       | SNOTEL  | 7850              | 0             | 0.0         | 6.4            | 0%          | 8.3                   | 130%                  |
| Big Snowy          | SC      | 7150              |               |             |                |             |                       |                       |
| Bisson Creek       | SNOTEL  | 4920              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Black Bear         | SNOTEL  | 8170              | 5             | 1.0         | 24.5           | 4%          | 27.9                  | 114%                  |
| Black Mountain     | SC      | 7750              |               |             |                |             |                       |                       |
| Black Pine         | SNOTEL  | 7210              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Blacktail          | SC      | 5650              |               |             |                |             |                       |                       |
| Blacktail Mtn      | SNOTEL  | 5650              | 0             | 0.0         |                |             | 0.0                   |                       |
| Bloody Dick        | SNOTEL  | 7600              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Bots Sots          | SC      | 7750              |               |             |                |             |                       |                       |
| Boulder Mountain   | SNOTEL  | 7950              | 6             | 0.4         | 9.1            | 4%          | 9.5                   | 104%                  |
| Box Canyon         | SNOTEL  | 6670              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Boxelder Creek     | SC      | 5100              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Brackett Creek     | SNOTEL  | 7320              | 0             | 0.0         | 3.1            | 0%          | 9.0                   | 290%                  |
| Bristow Creek      | SC      | 3900              |               |             |                |             |                       |                       |
| Brush Creek Timber | SC      | 5000              |               |             |                |             |                       |                       |
| Bull Mountain      | SC      | 6600              |               |             |                |             |                       |                       |
| Burnt Mtn          | SNOTEL  | 5880              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Cabin Creek        | SC      | 5200              |               |             |                |             |                       |                       |
| Calvert Creek      | SNOTEL  | 6430              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Camp Senia         | SC      | 7890              |               |             |                |             |                       |                       |
| Canyon             | SNOTEL  | 7870              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Carrot Basin       | SNOTEL  | 9000              | 21            | 8.9         | 22.6           | 39%         | 19.3                  | 85%                   |
| Chessman Reservoir | SC      | 6200              |               |             |                |             |                       |                       |
| Chicago Ridge      | SC      | 5800              |               |             |                |             |                       |                       |
| Chicken Creek      | SC      | 4060              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Clover Meadow      | SNOTEL  | 8600              | 12            | 5.1         | 10.4           | 49%         | 8.5                   | 82%                   |
| Cole Creek         | SNOTEL  | 7850              | 25            | 12.0        | 9.2            | 130%        | 16.8                  | 183%                  |
| Combination        | SNOTEL  | 5600              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Copper Bottom      | SNOTEL  | 5200              | 0             | 0.0         |                |             | 0.0                   |                       |
| Copper Camp        | SNOTEL  | 6950              | 0             | 0.0         |                |             | 20.2                  |                       |
| Copper Mountain    | SC      | 7700              |               |             |                |             |                       |                       |
| Cottonwood Creek   | SC      | 6400              |               |             |                |             |                       |                       |
| Coyote Hill        | SC      | 4200              |               |             |                |             |                       |                       |
| Crevice Mountain   | SC      | 8400              |               |             |                |             |                       |                       |
| Crystal Lake       | SNOTEL  | 6050              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Dad Creek Lake     | SC      | 8800              |               |             |                |             |                       |                       |
| Daisy Peak         | SNOTEL  | 7600              | 2             | 0.9         | 0.0            |             | 0.5                   |                       |
| Daly Creek         | SNOTEL  | 5780              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |

| Site                 | Network | Elevation<br>(ft) | Depth<br>(in) | SWE<br>(in) | Median<br>(in) | %<br>Median | Last Year<br>SWE (in) | Last Year<br>% Median |
|----------------------|---------|-------------------|---------------|-------------|----------------|-------------|-----------------------|-----------------------|
| Darkhorse Lake       | SNOTEL  | 8600              | 45            | 20.1        | 26.0           | 77%         | 30.5                  | 117%                  |
| Deadman Creek        | SNOTEL  | 6450              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Desert Mountain      | SC      | 5600              |               |             |                |             |                       |                       |
| Discovery Basin      | SC      | 7050              | 0             | 0.0         | 0.2            | 0%          | 4.9                   | 2450%                 |
| Divide               | SNOTEL  | 7800              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Dix Hill             | SC      | 6400              |               |             |                |             | 0.0                   |                       |
| Dupuyer Creek        | SNOTEL  | 5750              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Eagle Creek          | SC      | 7000              |               |             |                |             |                       |                       |
| East Boulder Mine    | SNOTEL  | 6335              | 0             | 0.0         |                |             | 0.1                   |                       |
| El Dorado Mine       | SC      | 7800              |               |             |                |             |                       |                       |
| Elk Horn Springs     | SC      | 7800              |               |             |                |             |                       |                       |
| Elk Peak             | SNOTEL  | 7600              | 0             | 0.0         |                |             | 16.9                  |                       |
| Elk Peak             | SC      | 8000              |               |             |                |             |                       |                       |
| Emery Creek          | SNOTEL  | 4350              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Fatty Creek          | SC      | 5500              |               |             |                |             |                       |                       |
| Fish Creek           | SC      | 8000              |               |             |                |             |                       |                       |
| Fisher Creek         | SNOTEL  | 9100              | 40            | 19.9        | 28.1           | 71%         | 37.1                  | 132%                  |
| Flattop Mtn.         | SNOTEL  | 6300              | 39            | 18.9        | 32.3           | 59%         | 46.6                  | 144%                  |
| Fleecer Ridge        | SC      | 7500              |               |             |                |             |                       |                       |
| Foolhen              | SC      | 8280              |               |             |                |             |                       |                       |
| Forest Lake          | SC      | 6400              |               |             |                |             |                       |                       |
| Four Mile            | SC      | 6900              |               |             |                |             |                       |                       |
| Freight Creek        | SC      | 6000              |               |             |                |             |                       |                       |
| Frohner Meadow       | SNOTEL  | 6480              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Garver Creek         | SNOTEL  | 4250              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Gibbons Pass         | SC      | 7100              |               |             |                |             |                       |                       |
| Goat Mountain        | SC      | 7000              |               |             |                |             |                       |                       |
| Government Saddle    | SC      | 5270              |               |             |                |             |                       |                       |
| Grave Creek          | SNOTEL  | 4300              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Griffin Creek Divide | SC      | 5150              |               |             |                |             |                       |                       |
| Hand Creek           | SNOTEL  | 5035              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Hawkins Lake         | SNOTEL  | 6450              | 0             | 0.0         | 12.2           | 0%          | 11.4                  | 93%                   |
| Haymaker             | SC      | 8050              |               |             |                |             |                       |                       |
| Hebgen Dam           | SC      | 6550              |               |             |                |             |                       |                       |
| Hell Roaring Divide  | SC      | 5770              | 6             | 3.2         | 11.3           | 28%         | 23.7                  | 210%                  |
| Herrig Junction      | SC      | 4850              | 0             | 0.0         | 0.3            | 0%          | 14.8                  | 4933%                 |
| Highwood Divide      | SC      | 5650              |               |             |                |             |                       |                       |
| Highwood Station     | SC      | 4600              |               |             |                |             |                       |                       |
| Holbrook             | SC      | 4530              |               |             |                |             |                       |                       |
| Hoodoo Basin         | SNOTEL  | 6050              | 21            | 10.8        | 23.5           | 46%         | 42.4                  | 180%                  |
| Humboldt Gulch       | SNOTEL  | 4250              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Jakes Canyon         | SC      | 9040              |               |             |                |             |                       |                       |
| Johnson Park         | SC      | 6450              |               |             |                |             |                       |                       |
| Kishenehn            | SC      | 3890              |               |             |                |             |                       |                       |
| Kraft Creek          | SNOTEL  | 4750              | 0             | 0.0         |                |             | 0.0                   |                       |
| Lake Camp            | SC      | 7780              |               |             |                |             |                       |                       |
| Lakeview Canyon      | SC      | 6930              |               |             |                |             |                       |                       |
| Lakeview Ridge       | SNOTEL  | 7400              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Lemhi Ridge          | SNOTEL  | 8100              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Lick Creek           | SNOTEL  | 6860              | 0             | 0.0         | 0.0            |             | 0.9                   |                       |
| Little Park          | SC      | 7400              |               |             |                |             |                       |                       |
| Logan Creek          | SC      | 4300              |               |             |                |             |                       |                       |
| Lolo Pass            | SNOTEL  | 5240              | 0             | 0.0         | 0.0            |             | 7.9                   |                       |
| Lone Mountain        | SNOTEL  | 8880              | 0             | 0.0         | 8.4            | 0%          | 13.8                  | 164%                  |
| Lookout              | SNOTEL  | 5140              | 0             | 0.0         | 0.0            |             | 1.6                   |                       |
| Lower Twin           | SNOTEL  | 7900              | 22            | 5.8         | 13.5           | 43%         | 16.1                  | 119%                  |
| Lubrecht Flume       | SNOTEL  | 4680              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |

| Site                  | Network | Elevation (ft) | Depth (in) | SWE (in) | Median (in) | % Median | Last Year SWE (in) | Last Year % Median |
|-----------------------|---------|----------------|------------|----------|-------------|----------|--------------------|--------------------|
| Lubrecht Forest No 3  | SC      | 5450           |            |          |             |          |                    |                    |
| Lubrecht Forest No 4  | SC      | 4650           |            |          |             |          |                    |                    |
| Lubrecht Forest No 6  | SC      | 4040           |            |          |             |          |                    |                    |
| Lubrecht Hydroplot    | SC      | 4200           |            |          |             |          |                    |                    |
| Lupine Creek          | SC      | 7380           |            |          |             |          |                    |                    |
| Madison Plateau       | SNOTEL  | 7750           | 0          | 0.0      | 6.2         | 0%       | 5.9                | 95%                |
| Many Glacier          | SNOTEL  | 4900           | 0          | 0.0      | 0.0         |          | 0.0                |                    |
| Marias Pass           | SC      | 5250           |            |          |             |          |                    |                    |
| Mineral Creek         | SC      | 4000           |            |          |             |          |                    |                    |
| Monument Peak         | SNOTEL  | 8850           | 11         | 5.1      | 15.3        | 33%      | 14.4               | 94%                |
| Moss Peak             | SNOTEL  | 6780           | 35         | 18.5     | 28.4        | 65%      | 40.3               | 142%               |
| Moulton Reservoir     | SC      | 6850           |            |          |             |          |                    |                    |
| Mount Allen No 7      | SC      | 5700           |            |          |             |          |                    |                    |
| Mount Lockhart        | SNOTEL  | 6400           | 0          | 0.0      | 4.5         | 0%       | 12.9               | 287%               |
| Mudd Lake             | SC      | 7650           |            |          |             |          |                    |                    |
| Mule Creek            | SNOTEL  | 8300           | 10         | 3.5      | 9.4         | 37%      | 11.3               | 120%               |
| N Fk Elk Creek        | SNOTEL  | 6250           | 0          | 0.0      | 0.0         |          | 0.0                |                    |
| Nevada Ridge          | SNOTEL  | 7020           | 0          | 0.0      | 2.5         | 0%       | 5.6                | 224%               |
| New World             | SC      | 6900           |            |          |             |          |                    |                    |
| Nez Perce Camp        | SNOTEL  | 5650           | 0          | 0.0      | 0.0         |          | 0.0                |                    |
| Noisy Basin           | SNOTEL  | 6040           | 25         | 12.0     | 28.5        | 42%      | 33.7               | 118%               |
| Norris Basin          | SC      | 7550           |            |          |             |          |                    |                    |
| North Fork Jocko      | SNOTEL  | 6330           | 10         | 4.4      | 21.2        | 21%      | 35.6               | 168%               |
| Northeast Entrance    | SNOTEL  | 7350           | 0          | 0.0      | 0.0         |          | 0.0                |                    |
| Onion Park            | SNOTEL  | 7410           | 0          | 0.0      | 2.4         | 0%       | 2.4                | 100%               |
| Ophir Park            | SC      | 7150           |            |          | 3.2         |          | 6.7                | 209%               |
| Parker Peak           | SNOTEL  | 9400           | 7          | 1.6      | 13.8        | 12%      | 21.2               | 154%               |
| Peterson Meadows      | SNOTEL  | 7200           | 0          | 0.0      | 1.3         | 0%       | 4.0                | 308%               |
| Pickfoot Creek        | SNOTEL  | 6650           | 0          | 0.0      | 0.0         |          | 0.0                |                    |
| Pike Creek            | SNOTEL  | 5930           | 0          | 0.0      |             |          | 0.0                |                    |
| Pipestone Pass        | SC      | 7200           |            |          |             |          |                    |                    |
| Placer Basin          | SNOTEL  | 8830           | 22         | 8.4      | 13.1        | 64%      | 18.5               | 141%               |
| Poorman Creek         | SNOTEL  | 5100           | 0          | 0.0      | 0.8         | 0%       | 15.9               | 1988%              |
| Porcupine             | SNOTEL  | 6500           | 0          | 0.0      | 0.0         |          | 0.0                |                    |
| Potomageton Park      | SC      | 7150           |            |          |             |          |                    |                    |
| Revais                | SC      | 4800           |            |          | 0.0         |          |                    |                    |
| Rock Creek Mdws       | SC      | 3400           |            |          |             |          |                    |                    |
| Rocker Peak           | SNOTEL  | 8000           | 9          | 4.2      | 10.6        | 40%      | 15.1               | 142%               |
| Rocky Boy             | SNOTEL  | 4700           | 0          | 0.0      | 0.0         |          | 0.0                |                    |
| Roland Summit         | SC      | 5120           |            |          |             |          |                    |                    |
| S Fork Shields        | SNOTEL  | 8100           | 0          | 0.0      | 9.0         | 0%       | 10.6               | 118%               |
| Sacajawea             | SNOTEL  | 6550           | 0          | 0.0      | 0.0         |          | 0.0                |                    |
| Saddle Mtn.           | SNOTEL  | 7940           | 7          | 2.9      | 13.3        | 22%      | 27.5               | 207%               |
| Short Creek           | SNOTEL  | 7000           | 0          | 0.0      | 0.0         |          | 0.0                |                    |
| Shower Falls          | SNOTEL  | 8100           | 30         | 11.6     | 17.0        | 68%      | 24.4               | 144%               |
| Skalkaho Summit       | SNOTEL  | 7250           | 0          | 0.0      | 9.5         | 0%       | 10.2               | 107%               |
| Sleeping Woman        | SNOTEL  | 6150           | 0          | 0.0      | 0.0         |          | 0.0                |                    |
| Slide Rock Mountain   | SC      | 7100           |            |          |             |          |                    |                    |
| Spotted Bear Mountain | SC      | 7000           |            |          |             |          |                    |                    |
| Spur Park             | SNOTEL  | 8100           | 25         | 10.9     | 13.9        | 78%      | 17.5               | 126%               |
| Stahl Peak            | SNOTEL  | 6030           | 18         | 9.0      | 25.8        | 35%      | 36.9               | 143%               |
| Stemple Pass          | SC      | 6600           |            |          |             |          |                    |                    |
| Storm Lake            | SC      | 7780           |            |          |             |          |                    |                    |
| Stringer Creek        | SNOTEL  | 6550           | 0          | 0.0      | 0.0         |          | 0.0                |                    |
| Stryker Basin         | SC      | 6180           | 22         | 10.8     | 20.1        | 54%      | 33.9               | 169%               |
| Stuart Mountain       | SNOTEL  | 7400           | 26         | 12.2     | 18.8        | 65%      | 31.3               | 166%               |

| Site               | Network | Elevation<br>(ft) | Depth<br>(in) | SWE<br>(in) | Median<br>(in) | %<br>Median | Last Year<br>SWE (in) | Last Year<br>% Median |
|--------------------|---------|-------------------|---------------|-------------|----------------|-------------|-----------------------|-----------------------|
| Taylor Road        | SC      | 4080              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Ten Mile Lower     | SC      | 6600              |               |             |                |             |                       |                       |
| Ten Mile Middle    | SC      | 6800              |               |             |                |             |                       |                       |
| Tepee Creek        | SNOTEL  | 8000              | 0             | 0.0         | 1.8            | 0%          | 0.0                   | 0%                    |
| Timberline Creek   | SC      | 8850              |               |             |                |             |                       |                       |
| Tizer Basin        | SNOTEL  | 6880              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Trinkus Lake       | SC      | 6100              |               |             |                |             |                       |                       |
| Truman Creek       | SC      | 4060              |               |             |                |             |                       |                       |
| Twelvemile Creek   | SNOTEL  | 5600              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Twenty-One Mile    | SC      | 7150              |               |             |                |             |                       |                       |
| Twin Lakes         | SNOTEL  | 6400              | 0             | 0.0         | 16.5           | 0%          | 29.9                  | 181%                  |
| Upper Holland Lake | SC      | 6200              |               |             |                |             |                       |                       |
| Waldron            | SNOTEL  | 5600              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Warm Springs       | SNOTEL  | 7800              | 27            | 12.1        | 17.0           | 71%         | 25.1                  | 148%                  |
| Weasel Divide      | SC      | 5450              |               |             |                |             |                       |                       |
| West Yellowstone   | SNOTEL  | 6700              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Whiskey Creek      | SNOTEL  | 6800              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| White Elephant     | SNOTEL  | 7710              | 0             | 0.0         | 4.4            | 0%          | 0.0                   | 0%                    |
| White Mill         | SNOTEL  | 8700              | 24            | 12.0        | 16.9           | 71%         | 23.4                  | 138%                  |
| Wolverine          | SNOTEL  | 7650              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Wood Creek         | SNOTEL  | 5960              | 0             | 0.0         | 0.0            |             | 0.0                   |                       |
| Wrong Creek        | SC      | 5700              |               |             |                |             |                       |                       |
| Wrong Ridge        | SC      | 6800              |               |             |                |             |                       |                       |
| Younts Peak        | SNOTEL  | 8350              |               |             | 3.2            |             |                       |                       |

*Issued by:*

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**Montana**  
**Water Supply Outlook**  
**Report**  
Natural Resources Conservation Service

