

Libby : January Runoff Forecast & Flood Risk Management Calculation

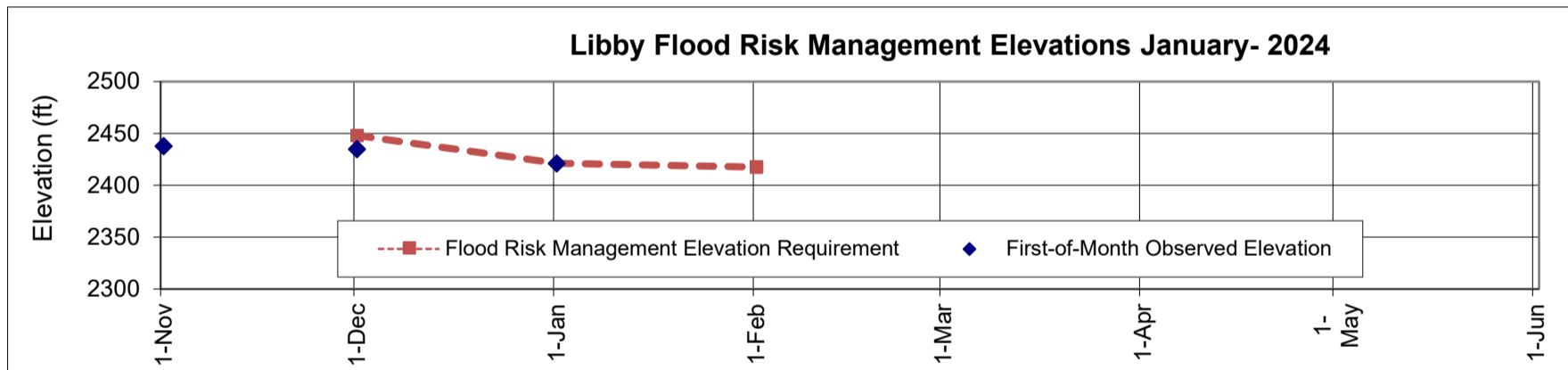
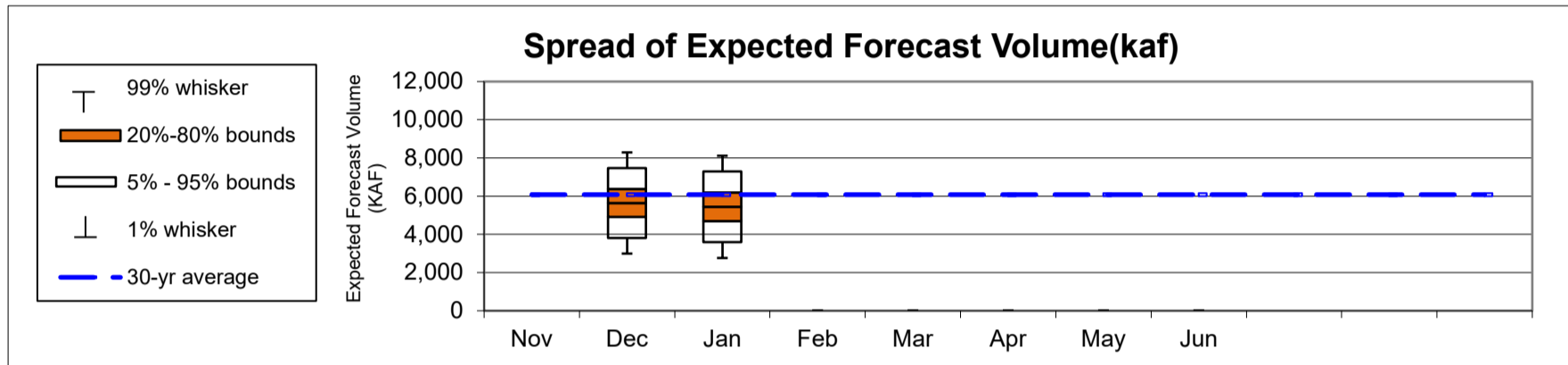
WY 2024

| Runoff Forecast | January | 1991-2020 Average | 1991 - 2020 Percent of Average | 1929-2020 Average | 1929 - 2020 Percent of Average |
|--|---------|-------------------|--------------------------------|-------------------|--------------------------------|
| Most Probable Runoff Volume: Apr-Aug (kaf) | 5440 | 6080 | 89% | 6259 | 87% |
| Most Probable Runoff Volume: Apr-Jul (kaf) | 4984 | 5570 | 89% | 5708 | 87% |
| Most Probable Runoff Volume: May-Jul (kaf) | 4486 | 5014 | 89% | 5183 | 87% |

| Flood Risk Management | January |
|---|---------|
| 31-Jan Flood Risk Management Space (kaf) | 1757 |
| 31-Jan Flood Risk Management Elevation (ft) | 2417.6 |

| Forecast/Reservoir Data | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun |
|-------------------------------|--------|--------|--------|-----|-----|-----|-----|-----|
| Apr-Aug Runoff Forecast (kaf) | | 5642 | 5440 | | | | | |
| First-of-Month Elev (ft) | 2437.9 | 2434.8 | 2421.2 | | | | | |

| Seasonal FRM Requirements | 30-Nov | 31-Dec | 31-Jan | 28-Feb | 31-Mar | 30-Apr | | |
|--------------------------------------|--------|--------|--------|--------|--------|--------|--|--|
| Flood Risk Management Space (kaf) | 500 | 1613 | 1757 | | | | | |
| Flood Risk Management Elevation (ft) | 2448.0 | 2421.3 | 2417.6 | | | | | |



Notes:

1. The given forecast is the official Corps of Engineers forecast for Libby. If you have any questions please contact Leon Basdekas (208) 353-2564, Courtney Moore (206) 316-3005, David Varner (206) 316-3155 or Jason Chang (206) 764-3528.
2. If a prior month's forecast as published in this document is different than what was originally published in the issue month, then the earlier forecast has been adjusted to reflect updated values for precipitation or streamflow.

Libby : January Runoff Forecast & Flood Risk Management Calculation
Apr-Aug Runoff Forecast Calculation:

| <i>Variable</i> | <i>Month(s)</i> | <i>Units</i> | <i>Observed Value A</i> | <i>Percent of Average (1991-2020)</i> | <i>Regression Coefficient B</i> | <i>Marginal Runoff (KAF) =A*B</i> |
|---------------------------|-----------------|--------------|-------------------------|---------------------------------------|---------------------------------|-----------------------------------|
| SOI | ∑Jun:Jul | | 0.00 | | 95.28 | 0.0 |
| Eureka RS, MT | ∑Oct:Dec Prcp | inches | 3.55 | 96% | 141.74 | 503.1 |
| West Glacier, MT | ∑Oct:Dec Prcp | inches | 8.38 | 88% | 58.42 | 489.6 |
| Cranbrook A, BC | ∑Oct:Dec Prcp | millimeters | 54.40 | 56% | 4.58 | 249.2 |
| Fernie, BC | ∑Oct:Dec Prcp | millimeters | 471.42 | 124% | 1.20 | 565.7 |
| Hawkins Lake, MT | 1-Jan SWE | inches | | | | |
| Stahl Peak, MT | 1-Jan SWE | inches | 11.90 | 70% | 34.63 | 412.1 |
| East Creek, BC | 1-Jan SWE | millimeters | | | | |
| Moyie Mountain, BC | 1-Jan SWE | millimeters | 85.00 | 47% | 1.59 | 134.7 |
| Sunshine Village, AB | 1-Jan SWE | millimeters | 168.69 | 62% | 2.14 | 361.0 |
| Akamina Pass, AB | 1-Jan SWE | millimeters | | | | |
| South Racehorse Creek, AB | 1-Jan SWE | millimeters | | | | |
| Intercept | | | 1 | | 2724.44 | 2724.4 |
| January Forecast | April - August | kaf | | | | 5439.8 |

Data used in Libby Water Supply Forecast

| <i>Climate Data</i> | <i>Jun-23</i> | <i>Jul-23</i> |
|---------------------|---------------|---------------|
| SOI | 0.30 | -0.30 |

| <i>Precipitation Data</i> | <i>Oct</i> | <i>Nov</i> | <i>Dec</i> | <i>Jan</i> | <i>Feb</i> | <i>Mar</i> | <i>Apr</i> | <i>May</i> |
|---------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Eureka RS, MT (inch) | 0.58 | 1.88 | 1.09 | | | | | |
| West Glacier, MT (inch) | 1.52 | 4.12 | 2.74 | | | | | |
| Cranbrook A, BC (mm) | 4.80 | 22.20 | 27.40 | | | | | |
| Fernie, BC (mm) | 98.30 | 129.79 | 243.33 | | | | | |

| <i>Snow Water Equiv</i> | <i>Nov</i> | <i>Dec</i> | <i>Jan</i> | <i>Feb</i> | <i>Mar</i> | <i>Apr</i> | <i>May</i> | <i>Jun</i> |
|--------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Hawkins Lake, MT (inch) | | | | | | | | |
| Stahl Peak, MT (inch) | | | 12 | | | | | |
| East Creek, BC (mm) | | | | | | | | |
| Moyie Mountain, BC (mm) | | | 85 | | | | | |
| Sunshine Village, AB (mm) | | | 169 | | | | | |
| Akamina Pass, AB (mm) | | | | | | | | |
| South Racehorse Creek, AB (mm) | | | | | | | | |

| <i>Streamflow</i> | <i>Nov</i> | <i>Dec</i> | <i>Jan</i> | <i>Feb</i> | <i>Mar</i> | <i>Apr</i> | <i>May</i> | <i>Jun</i> |
|---------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Libby Inflow Volume (kaf) | | | | | | | | |

| <i>Reservoir Elevation</i> | <i>Nov</i> | <i>Dec</i> | <i>Jan</i> | <i>Feb</i> | <i>Mar</i> | <i>Apr</i> | <i>May</i> | <i>Jun</i> |
|----------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Libby FOM Elev (feet) | 2437.9 | 2434.8 | 2421.2 | | | | | |

William D. Proctor, P.E.
 Approving Official
 Ch., Hydrologic Engineering and Power Branch
 Northwestern Division

Leon Basdekas, P.E.
 Upper Columbia Senior Water Manager
 Seattle District