ASO Hydrologic Forecast Report

Uinta Mountains: Strawberry/Duchesne

Forecast Date: Mar. 18, 2026

Airborne Snow Observatories, Inc. is a public benefit corporation with a mission to provide high-quality, timely, and accurate snow measurement, modeling, and runoff forecasts to empower the world's water managers to make the best possible use of our planet's precious water.

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UINTA MOUNTAINS:
STRAWBERRY/DUCHESNE BASIN

Overview:

This report summarizes WRF-Hydro hydrologic analysis and forecast results for the Uinta Mountains: Strawberry/Duchesne River Basin for forecasts generated on Mar. 18, 2026. This report contains model analysis and forecast results for the ASO-assimilated and OpenLoop configurations of WRF-Hydro with the most recent ASO snow survey on Mar. 11-12, 2026. Hydrologic variables reported on in this report include snowpack, snowmelt, snow albedo, seasonal river flow/reservoir inflow, and soil moisture.

IMPORTANT: All modeled runoff and reservoir inflow forecasts are "natural" flow values with no accounting for reservoir storage/release, diversions, transfers or managed return flows. As such, these forecast numbers should be compared against analogous naturalized flow measurements or estimates.

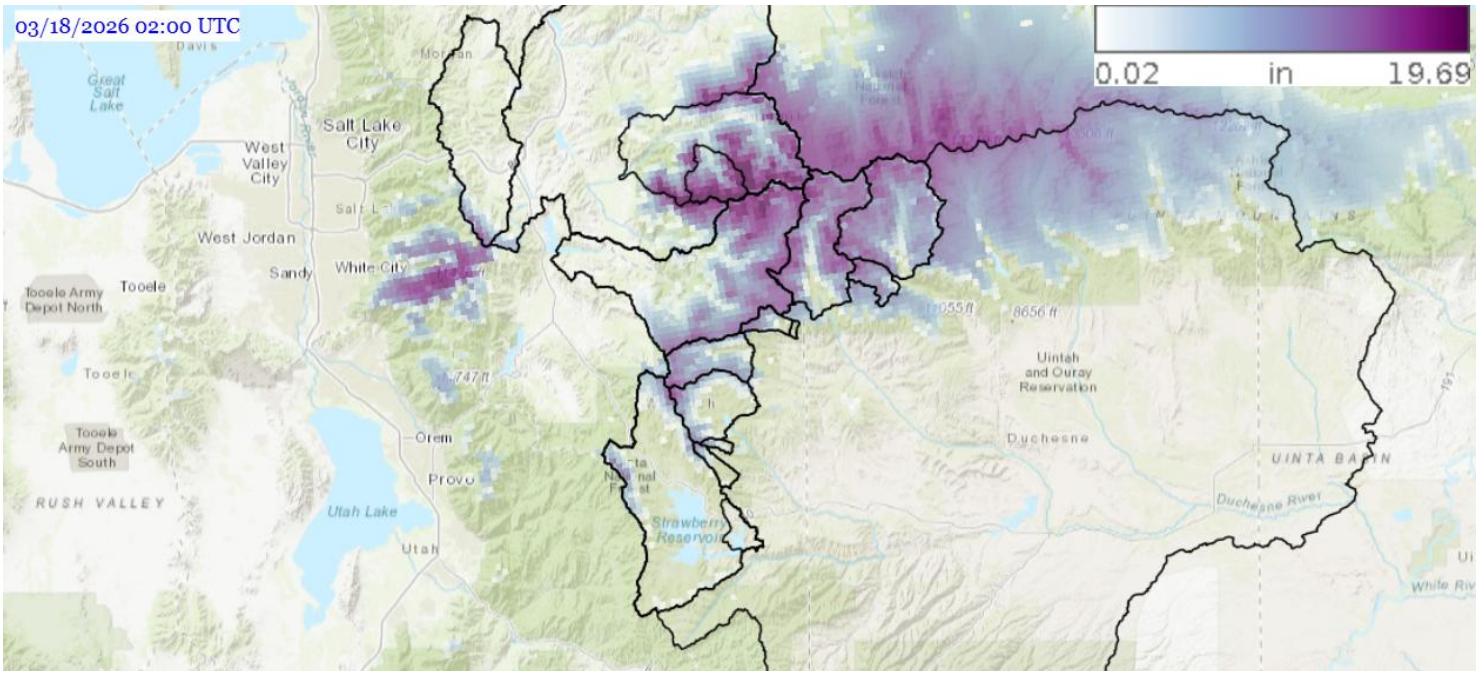

Figure 1. WRF-Hydro/ASO-assimilated 1km gridded Snow Water Equivalent (SWE - inches). Valid: Mar. 18, 2026

Snowpack Status: Impact of ASO Airborne Surveys

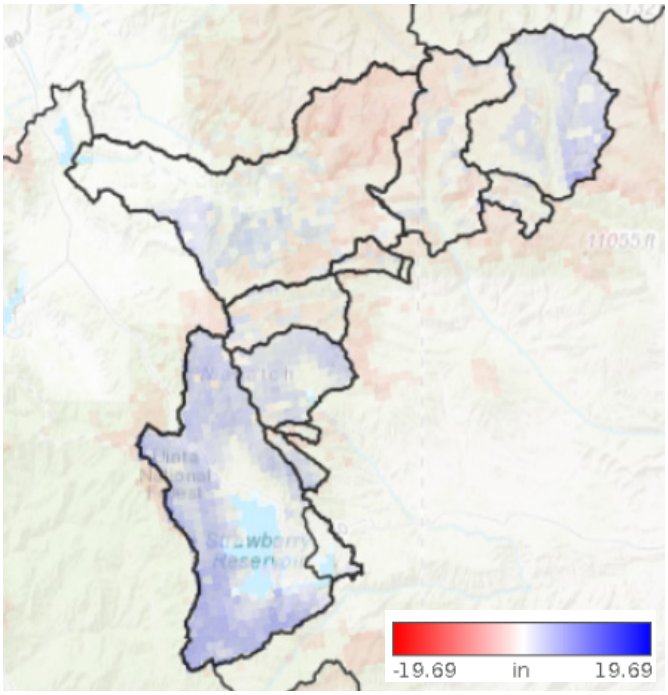

Figure 2. Spatial map of SWE difference between WRF-Hydro ASO-assimilated values and OpenLoop values (inches). Blue values indicate where the survey was greater than the Open-Loop model Valid: Mar. 18, 2026

Table 1. Valid: Mar. 18, 2026

Basin	Estimated SWE volume (kac-ft)
SNODAS	342.104
ASO-assimilated	229.551

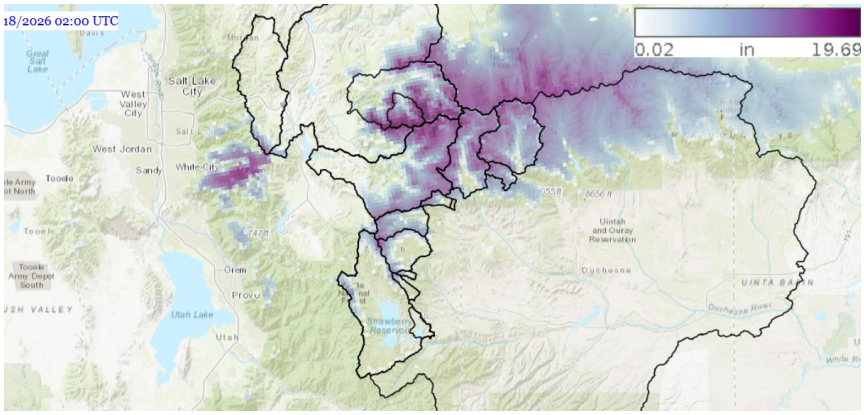

Figure 3. ASO WRF-Hydro SWE POSTERIROR to ASO survey assimilation (mm) Valid: Mar. 18, 2026

Impact of ASO Survey Assimilation:

The impact of assimilating the ASO survey data was to increase survey area integrated total snowpack by 53 TAF. Most of the increases in snowpack were in the Strawberry River basin above Strawberry Reservoir while small and variable decreases in snowpack due to assimilation were found in the along the primary Uinta Mountian subbasin areas. (Fig. 2) The Provo River basin saw a mix of increases and decreases but a net gain of 13 TAF.

Snowpack Status: Snowpack Volume

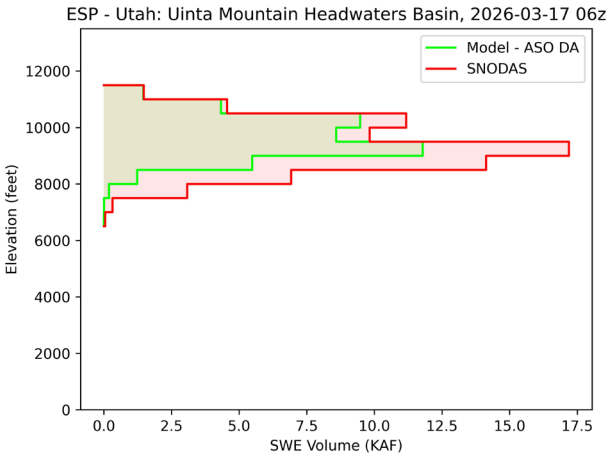

Figure 4. Elevation distribution of SWE between WRF-Hydro ASO-assimilated model and SNODAS (kac-ft). Valid: Mar. 18, 2026

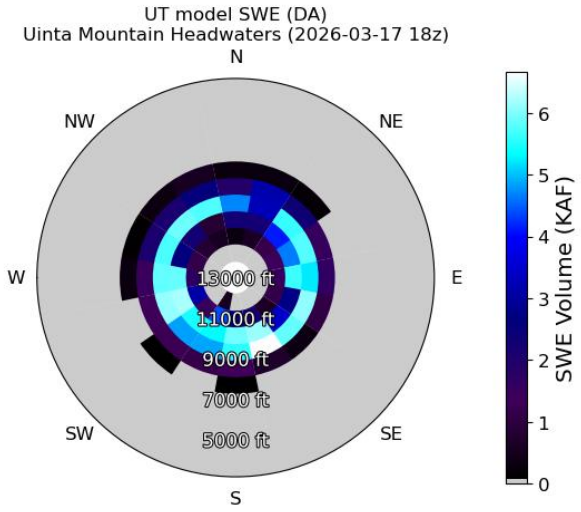

Figure 5. Terrain aspect-elevation distribution of snowpack (kac-ft) Valid: Mar. 18, 2026

Summary of Snowpack Conditions:

The figures on this page show various distributions of snowpack within the basin. The elevation distribution of SWE in Fig. 4 shows that the ASO survey has observed significantly less snowpack than operational SNODAS estimate product from NOAA. Figure 6 shows that the ASO-assimialted snowpack in the basin is generally evenly distributed on most aspects. The seasonal trend of basin-integrated snowpack shown in Fig. 6 show the downward adjustment due to assimilation followed by some further reductions through snow ablation.

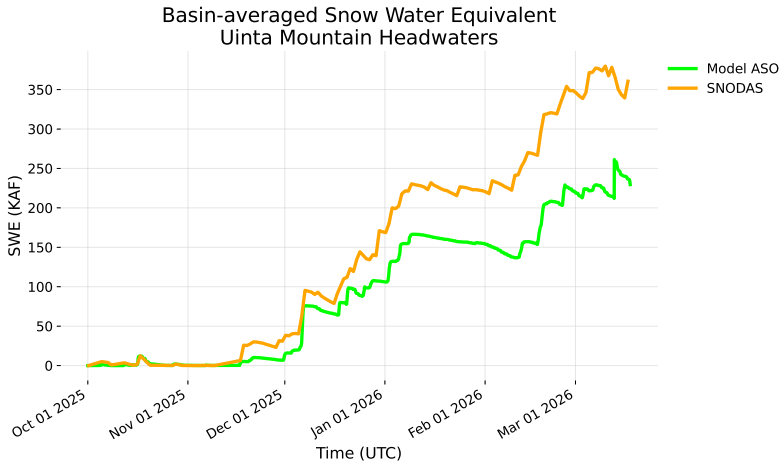

Figure 6. Basin-avg SWE from WRF-Hydro ASO-assimilated model and SNODAS (kac-ft). Valid: Mar. 18, 2026

Table 2. Valid: Mar. 18, 2026

Strawberry Reservoir - SWE

Basin	Estimated SWE volume (kac-ft)
SNODAS	45.247
ASO-assimilated	10.031

Provo R. above Jordanelle Res. - SWE

Basin	Estimated SWE volume (kac-ft)
SNODAS	59.033
ASO-assimilated	63.764

Rock Cr. above Stillwater - SWE

Basin	Estimated SWE volume (kac-ft)
SNODAS	63.242
ASO-assimilated	52.141

Snowpack Status: Snow Thermal States

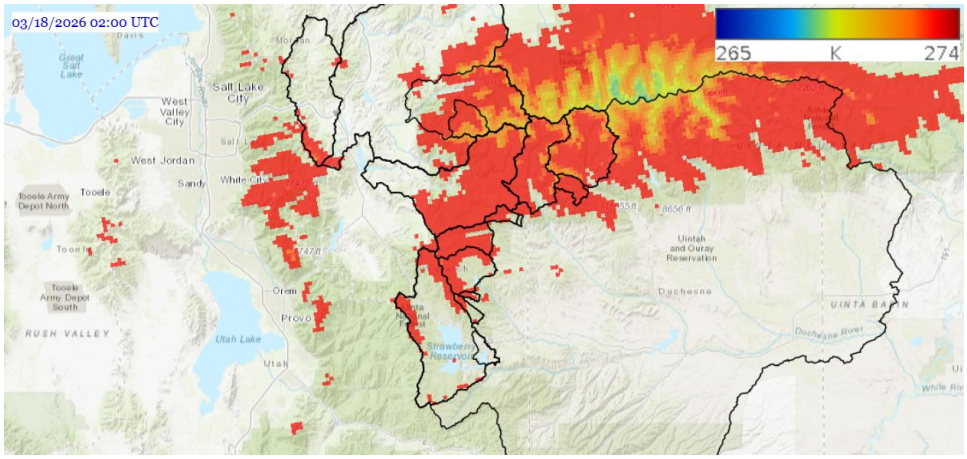

Figure 7. WRF-Hydro layer-averaged snowpack temperature (deg C). Valid: Apr. 15, 2026

Summary of Snowpack Albedo Conditions:

Mass-layer-averaged snowpack temperatures for the Uinta Mountain region snowpack show some remaining coupling to elevation with the highest elevations still having snowpack temperatures a few degrees below the melting point. (Figs. 8 and 9) Snowpack was at or near ripe conditions below around 9,000 ft.

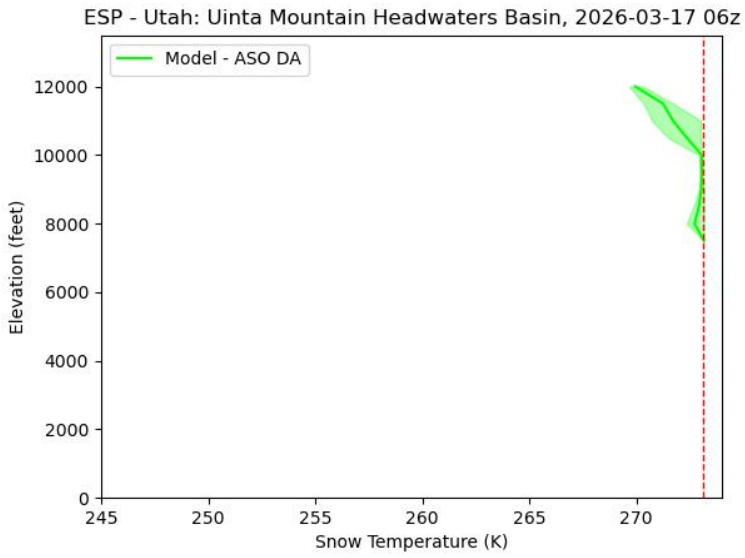

Figure 8. Elevation distribution of elevation-band averaged visible snowpack albedo (0-1). Valid: Mar. 18, 2026

Snowpack Status: Snow Albedo States

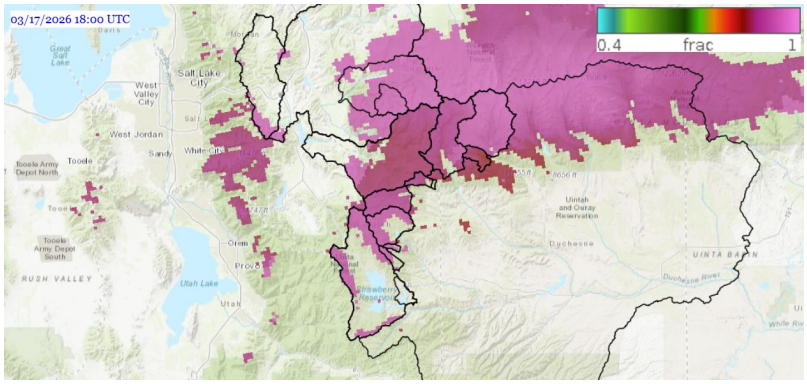

Figure 9. ASO WRF-Hydro visible snowpack albedo (0-1). Valid: Mar. 18, 2026

Summary of Snowpack Albedo Conditions:

Fig. 7 shows the spatial map of snow albedo conditions estimated by the ASO WRF-Hydro model. Generally, values of snow albedo were near or below 0.9 across the region of the Uinta Mountain domain. There is correspondingly more variability in albedo at lower elevations where more accelerated snowmelt has been occurring.

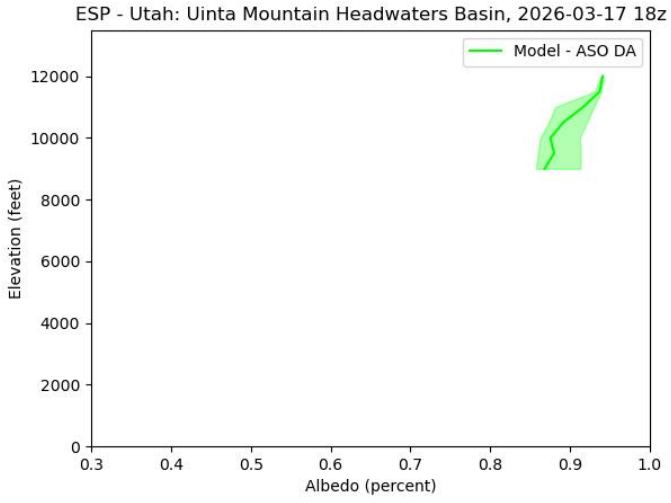

Figure 10. Elevation distribution of elevation-band averaged visible snowpack albedo (0-1). Valid: Mar. 18, 2026

ECMWF Short Range Weather Forecast:

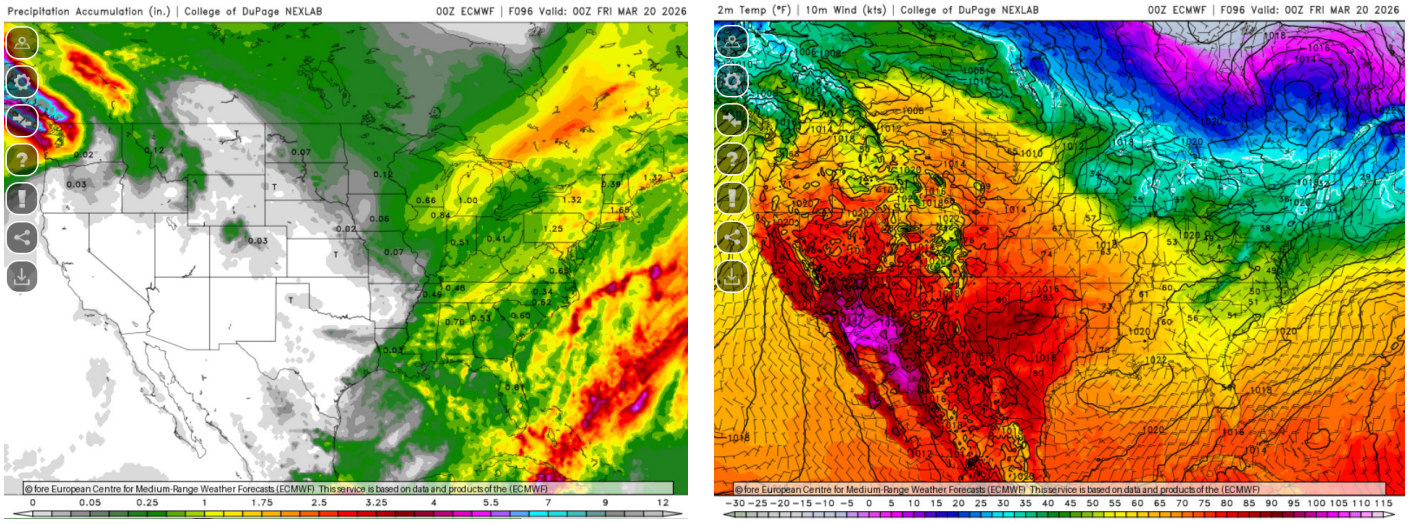

Figure 11. ECMWF forecasted total accumulated, 4-day precipitation (left panel) and sample daytime high temperature forecast (right panel) that are incorporated into the ASO WRF-Hydro runoff forecasts. ASO WRF-Hydro visible snowpack albedo (0-1). Valid: Mar. 12, 2026

Summary of ECMWF Four-day Weather forecast:

Four days of meteorological forecast data from the ECMWF weather forecast model are incorporated into the ASO WRF-Hydro forecasts. For the 4 days beginning on March 18, there was virtually no precipitation in the forecast. Additionally, air temperatures were forecasted to be unseasonably warm with daytime highs in the mid-40s to near 50 degrees F on some days. These conditions are unseasonably warm and dry for early March and contribute to lower April-July runoff forecasts compared to recent prior forecasts as more meltout and runoff occurs prior to April 1.

Snowpack Forecast:

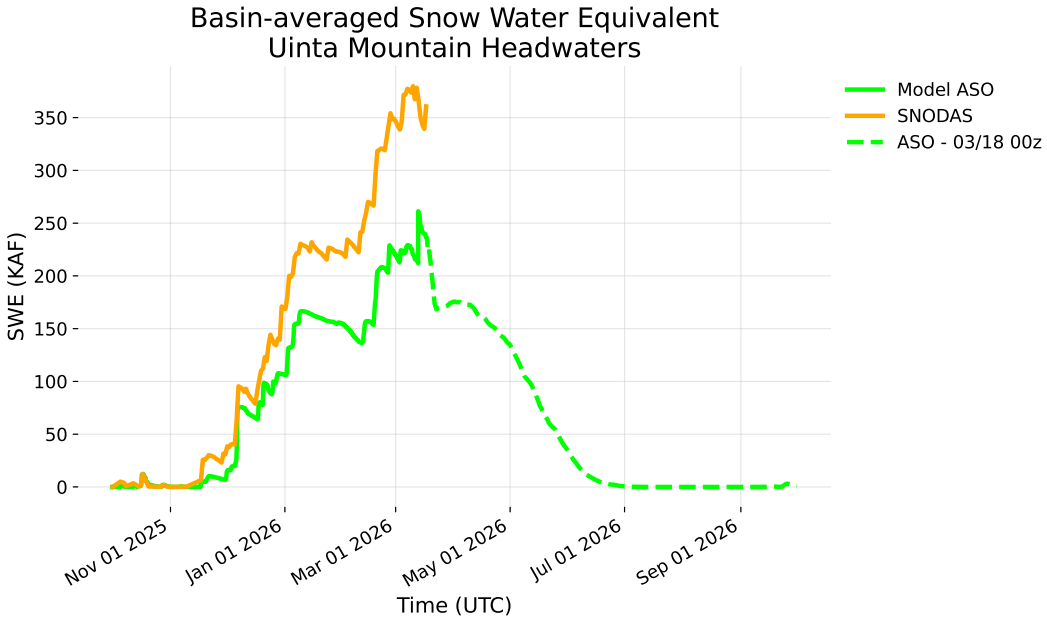

Figure 12. WRF-Hydro model analyzed and ensemble mean forecasted SWE. Valid: Mar. 18, 2026

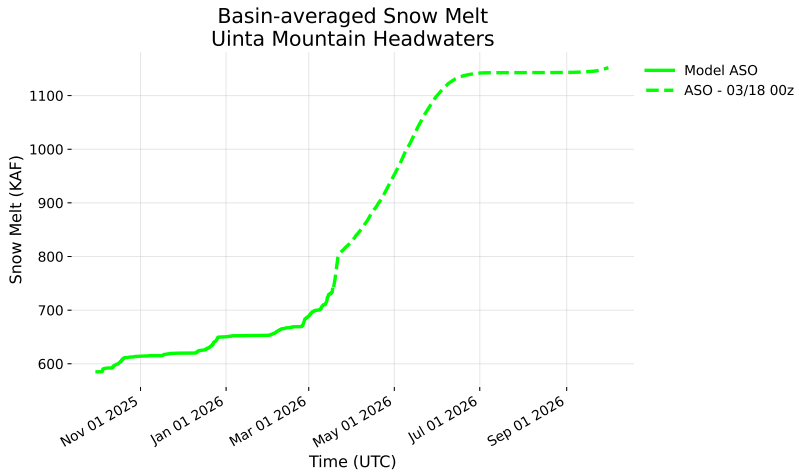

Figure 13. WRF-Hydro model forecasted basin-integrated ensemble mean accumulated snow-melt (inches) from the ASO-assimilated model instance. Valid: Mar. 18, 2026

Summary of Snowpack Forecasts

The snowpack forecasts for the ASO-assimialted model (dashed green line) shows there is a strong likelihood for continued strong ablation of snowpack in the coming days to weeks. A more typical climatological pattern of seasonal snowpack decay follows until snowpack disappearance in early to mid-June. Given the anomalous climate pattern exhibited this year, we do expect potentially more accelerated melting to occur in the first one-to-two weeks than what is depicted in the latest model run.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast						
Strawberry Reservoir Inflow						
Forecast Date		Q90	Q75	Q50	Q25	Q10
12-Mar-26		22.3	22.9	24.7	28.4	31.0

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast					
Water Hollow abv Diversion Dam					
Forecast Date	Q90	Q75	Q50	Q25	Q10
12-Mar-26	0.55	0.57	0.60	0.70	0.81

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast						
Layout Cr abv Diversion Dam						
Forecast Date		Q90	Q75	Q50	Q25	Q10
12-Mar-26		0.25	0.26	0.28	0.33	0.39

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast						
Currant Creek abv Dam						
Forecast Date		Q90	Q75	Q50	Q25	Q10
12-Mar-26		2.18	2.82	3.82	5.47	7.32

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast						
West Fork abv Diversion Dam						
Forecast Date		Q90	Q75	Q50	Q25	Q10
12-Mar-26		4.66	5.32	6.44	8.92	10.55

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast						
Wolf Cr. abv Diversion Dam						
Forecast Date		Q90	Q75	Q50	Q25	Q10
12-Mar-26		0.80	0.89	1.10	1.38	1.55

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast					
Twin Cr. abv Diversion Dam					
Forecast Date	Q90	Q75	Q50	Q25	Q10
12-Mar-26	0.13	0.16	0.20	0.24	0.28

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast						
Hades Cr.						
Forecast Date		Q90	Q75	Q50	Q25	Q10
12-Mar-26		2.48	3.17	4.67	6.28	7.18

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast					
S. Fork Rock Cr. abv Diversion					
Forecast Date	Q90	Q75	Q50	Q25	Q10
12-Mar-26	4.77	5.43	7.72	10.46	11.46

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast						
Rock Cr. abv Stillwater Diversion						
Forecast Date		Q90	Q75	Q50	Q25	Q10
12-Mar-26		25.1	29.8	47.5	68.2	76.9

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast						
Lake Fork abv Moon Lake						
Forecast Date		Q90	Q75	Q50	Q25	Q1
12-Mar-26		21.4	26.5	37.9	53.9	61

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast						
Yellowstone R abv Altonah						
Forecast Date		Q90	Q75	Q50	Q25	Q10
12-Mar-26		20.5	25.7	30.6	38.1	43.6

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast					
Duchesne River at Knight Diversion					
Forecast Date	Q90	Q75	Q50	Q25	Q10
12-Mar-26	72.5	81.1	112.9	148.5	167.0

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast						
Provo River at Woodland						
Forecast Date		Q90	Q75	Q50	Q25	Q10
12-Mar-26		41.7	48.4	66.2	86.6	104.1

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast					
Provo River at Hailstone					
Forecast Date	Q90	Q75	Q50	Q25	Q10
12-Mar-26	46.2	53.0	70.9	91.9	109.3

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Runoff & Reservoir Inflow Forecast:

ASO-Assimilated April-July Runoff Forecast						
Provo River - Jordanelle Inflow						
Forecast Date		Q90	Q75	Q50	Q25	Q10
12-Mar-26		48.6	55.2	73.5	94.2	111.9

Summary of Flow Forecasts

This flow forecast represents the April-July natural accumulated runoff for this site. No accounting for human diversions, impoundments or transfers have been included.

Soil Saturation Status:

Summary of Soil Moisture Conditions:

Basin averaged soil moisture level have increased recently due to accelerated melting of snowpack at mid-elevations. Lower elevation areas (Figs. 14-16) are starting to show signs of significant drying while middle elevations are nearing the seasonal peak values. Upper elevation areas under snowpack are also beginning to moisten up.

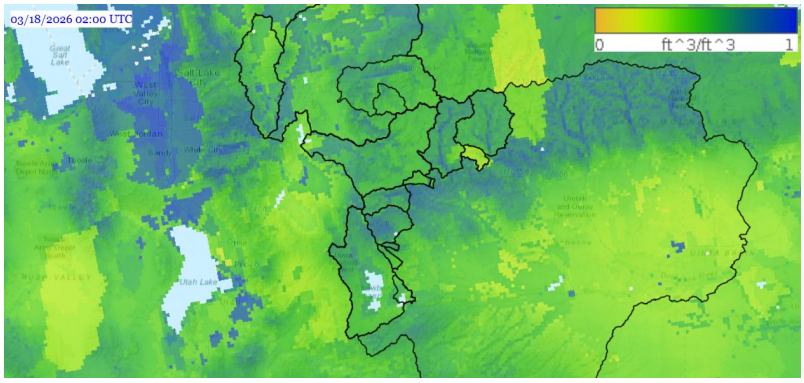

Figure 14. WRF-Hydro analyzed, vertically-integrated soil saturation. (%-saturation). Valid: Mar. 18, 2026

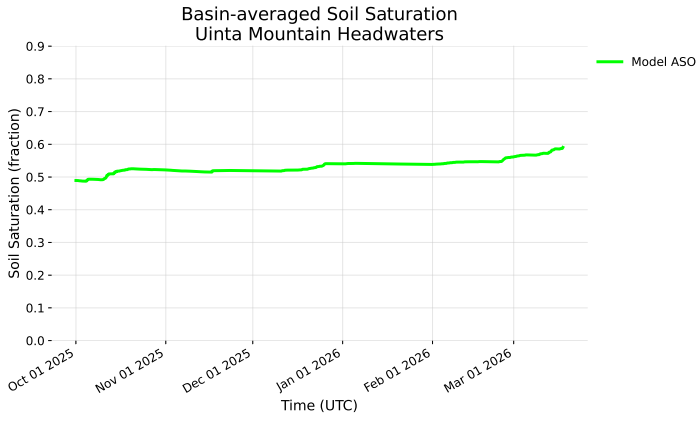

Figure 15. WRF-Hydro modeled soil saturation (% of saturation) from the ASO-assimilated model analyses. Valid: Mar. 18, 2026

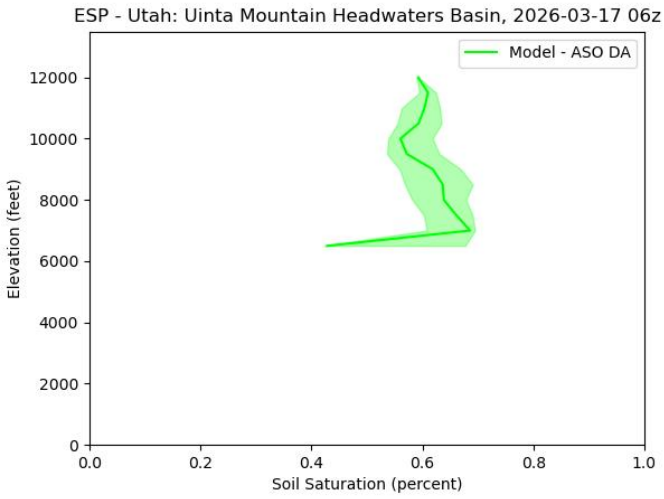

Figure 16. Elevation-band averaged soil saturation (% of saturation) modeled by the ASO WRF-Hydro system. Valid: Mar. 18, 2026

Supplemental flow/inflow forecast information: