

USBR WTMP Summary Report

Study: WTMP_SacramentoTrinity

Simulation: W2 - ResSim-May2024Fcst

Simulation Date: October 08, 2025 11:30

Report Date: October 08, 2025

A decorative graphic consisting of a smooth, wavy line that starts at the left edge, dips down, and then rises towards the right edge. The area below this line is filled with a solid blue color, while the area above it is white. The wavy line itself is a gradient of blue, transitioning from a lighter shade on the left to a darker shade on the right.

TABLE OF CONTENTS

Introduction	1
Study Summary	2
Iteration Summary	3
Iteration Summary	3
CE-QUAL-W2 Summary	4
Shasta Lake Outflow Temperature Summary	4
ResSim Summary	6
Keswick Reservoir Outflow Temperature Summary	6
Sacramento River above Clear Creek (CCR) Temperature Summary	8
Trinity Lake Outflow Temperature Summary	10
Lewiston Lake Outflow Temperature Summary	12
Whiskeytown Lake Outflow Temperature Summary	14
Iterations: CE-QUAL-W2	16
Iteration 000001: Shasta Lake Outflow	16
Iteration 000001: Shasta Lake Daily Outflow Water Temperature	18
Iterations: ResSim	20
Iteration 000001: Sacramento River System Flow	20
Iteration 000001: Trinity River System Flow	22
Iteration 000001: Sacramento River System Water Temperature	24
Iteration 000001: Trinity River System Water Temperature	26

TABLE OF FIGURES

Figure 1. Shasta Lake outflow temperature, forecast runs (variable input) with percentile envelopes computed. CE-QUAL-W2.	4
Figure 2. Shasta Lake outflow temperature, forecast runs (variable input), by iteration. CE-QUAL-W2.	5
Figure 3. Keswick Dam outflow temperature, forecast runs (variable input) with percentile envelopes computed. ResSim.	6
Figure 4. Keswick Dam outflow temperature, forecast runs (variable input), by iteration. ResSim.	7
Figure 5. Sacramento River above Clear Creek (CCR) temperature, forecast runs (variable input) with percentile envelopes computed. ResSim.	8
Figure 6. Sacramento River above Clear Creek temperature, forecast runs (variable input), by iteration. ResSim.	8
Figure 7. Trinity Dam outflow temperature, forecast runs (variable input) with percentile envelopes computed. ResSim.	10
Figure 8. Trinity Dam outflow temperature, forecast runs (variable input), by iteration. ResSim.	10
Figure 9. Lewiston Dam outflow temperature, forecast runs (variable input) with percentile envelopes computed. ResSim.	12
Figure 10. Lewiston Dam outflow temperature, forecast runs (variable input), by iteration. ResSim.	12
Figure 11. Whiskeytown Dam outflow temperature, forecast runs (variable input) with percentile envelopes computed. ResSim.	14
Figure 12. Whiskeytown Dam outflow temperature, forecast runs (variable input), by iteration. ResSim.	14
Figure 13. Iteration 000001: Shasta Lake daily outflow, forecast 2024. CE-QUAL-W2.	16
Figure 14. Iteration 000001: Shasta Lake daily outflow temperature, forecast 2024. CE-QUAL-W2.	18
Figure 15. Iteration 000001: Sacramento River system daily flow, forecast 2024. ResSim.	20
Figure 16. Iteration 000001: Trinity River system daily flow, forecast 2024. ResSim.	22
Figure 17. Iteration 000001: Sacramento River system daily water temperature, forecast 2024. ResSim.	24
Figure 18. Iteration 000001: Trinity River system water temperature, 2024. ResSim.	26

TABLE OF TABLES

Table 1. Iteration run information.	4
Table 2. Shasta Lake outflow temperature iteration statistical summary, May - Nov 2024 (°F). CE-QUAL-W2.	6
Table 3. Keswick Dam outflow temperature, iteration statistical summary, May - Nov 2024 (°F). ResSim.	8
Table 4. Sacramento River above Clear Creek tempeature, iteration statistical summary, May - Nov 2024 (°F). ResSim.	10
Table 5. Trinity Dam outflow temperature, iteration statistical summary, May - Nov 2024 (°F). ResSim.	12
Table 6. Lewiston Dam outflow temperature, iteration statistical summary, May - Nov 2024 (°F). ResSim.	14
Table 7. Whiskeytown Dam outflow temperature iteration statistical summary, May - Nov 2024 (°F). ResSim.	16
Table 8. Iteration 000001: Shasta Lake daily outflow statistical summary, May - Nov 2024 (cfs). CE-QUAL-W2.	17
Table 9. Iteration 000001: Shasta Lake monthly average outflow, 2024 (cfs). CE-QUAL-W2.	18
Table 10. Iteration 000001: Shasta Lake daily outflow temperature statistical summary, May - Nov 2024 (°F). CE-QUAL-W2.	19
Table 11. Iteration 000001: Shasta Lake monthly average outflow temperature, 2024 (°F). CE-QUAL-W2.	20
Table 12. Iteration 000001: Sacramento River system daily flow statistical summary, May - Nov 2024 (cfs). ResSim.	21
Table 13. Iteration 000001: Sacramento River system monthly average flow, 2024 (cfs). ResSim.	22
Table 14. Iteration 000001: Trinity River system daily flow statistical summary, May - Nov 2024 (cfs). ResSim.	23
Table 15. Iteration 000001: Trinity River system monthly average flow, 2024 (cfs). ResSim.	24
Table 16. Iteration 000001: Sacramento River system daily water temperature statistical summary, May - Nov 2024 (°F). ResSim.	25
Table 17. Iteration 000001: Sacramento River system monthly average water temperature, 2024 (°F). ResSim.	26
Table 18. Iteration 000001: Trinity River system water temperature statistical summary, May - Nov 2024 (°F). ResSim.	27
Table 19. Iteration 000001: Trinity River system monthly average water	28

TABLE OF TABLES

temperature, 2024 (°F). ResSim.

Introduction

This report presents an overview of temperature model results for the following conditions.

Project: WTMP_SacramentoTrinity

Simulation: W2 - ResSim-May2024Fcst

Analysis Period: 15 May 2024, 00:00 to 30 November 2024, 24:00

Models:

- Study Summary: CeQualW2

- Iteration Summary: CeQualW2

- CE-QUAL-W2 Summary: CeQualW2

- ResSim Summary: ResSim

- Iterations: CE-QUAL-W2: CeQualW2

- Iterations: ResSim: ResSim

Simulation Date: October 08, 2025 11:30

Report Date: October 08, 2025

Study Summary

Study: WTMP_SacramentoTrinity

Upper Sacramento River models include Shasta Lake and Keswick Reservoir on the Sacramento River, Whiskeytown Lake on Clear Creek, Sacramento River from Keswick Dam to above Clear Creek, Trinity Lake and Lewiston Reservoir on the Trinity River and Trinity River from Lewiston Dam to Helena, California. Models also include interbasin transfers from Lewiston Reservoir to Whiskeytown Lake (Clear Creek Tunnel) and Whiskeytown Lake to Keswick Reservoir (Spring Creek Tunnel).

Simulation Group: May2024Fcst

May 2024 Forecast Simulation Group

WatAlternative: W2 - ResSim

Analysis Period: May2024Fcst (15 May 2024, 00:00 - 30 November 2024, 24:00)

May 2024 Forecast Analysis Period

Iteration Summary

Iteration Summary

Iteration and member number are used interchangeably.

Table 1. Iteration run information.

Member Number	Operations	Met Set	Temp Target
1	May90_WY2024	L3MTO_May-2024	Above Clear Creek

CE-QUAL-W2 Summary

Shasta Lake Outflow Temperature Summary

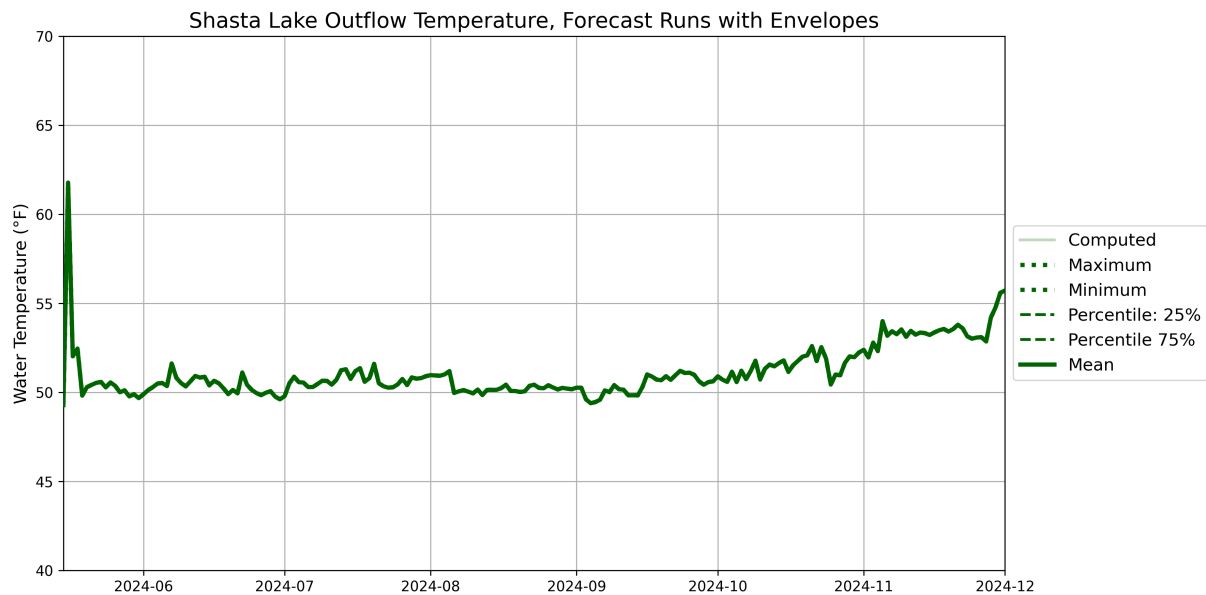


Figure 1. Shasta Lake outflow temperature, forecast runs (variable input) with percentile envelopes computed. CE-QUAL-W2.

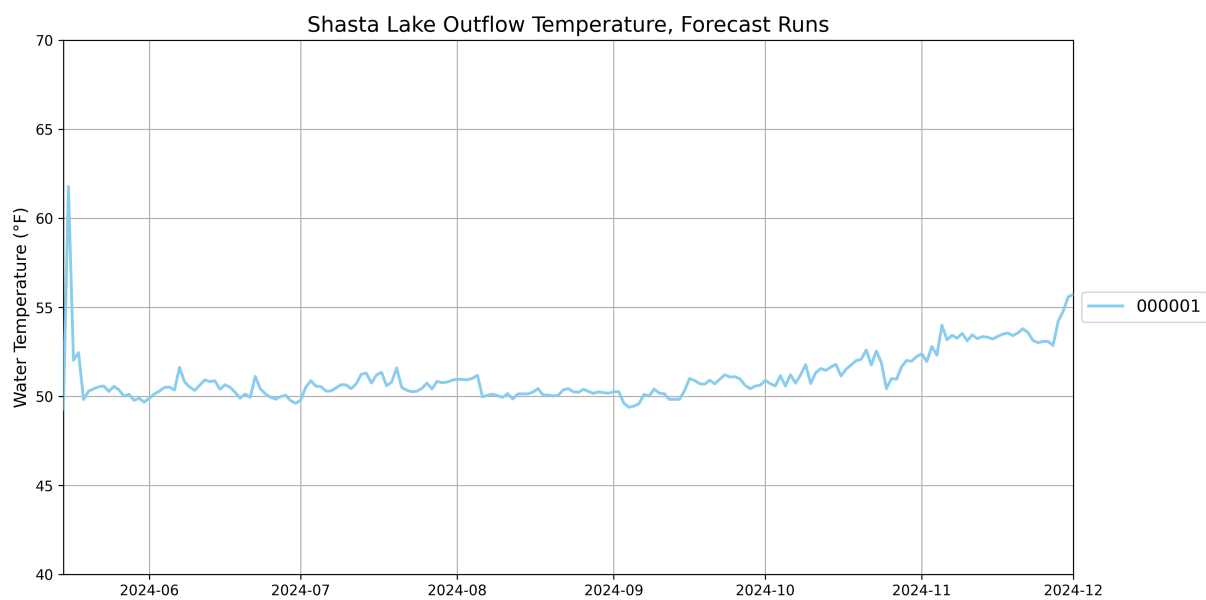


Figure 2. Shasta Lake outflow temperature, forecast runs (variable input), by iteration. CE-QUAL-W2.

Table 2. Shasta Lake outflow temperature iteration statistical summary, May - Nov 2024 (°F). CE-QUAL-W2.

Iteration	Maximum	Mean	Minimum
000001	61.8	51.1	49.3

ResSim Summary

Keswick Reservoir Outflow Temperature Summary

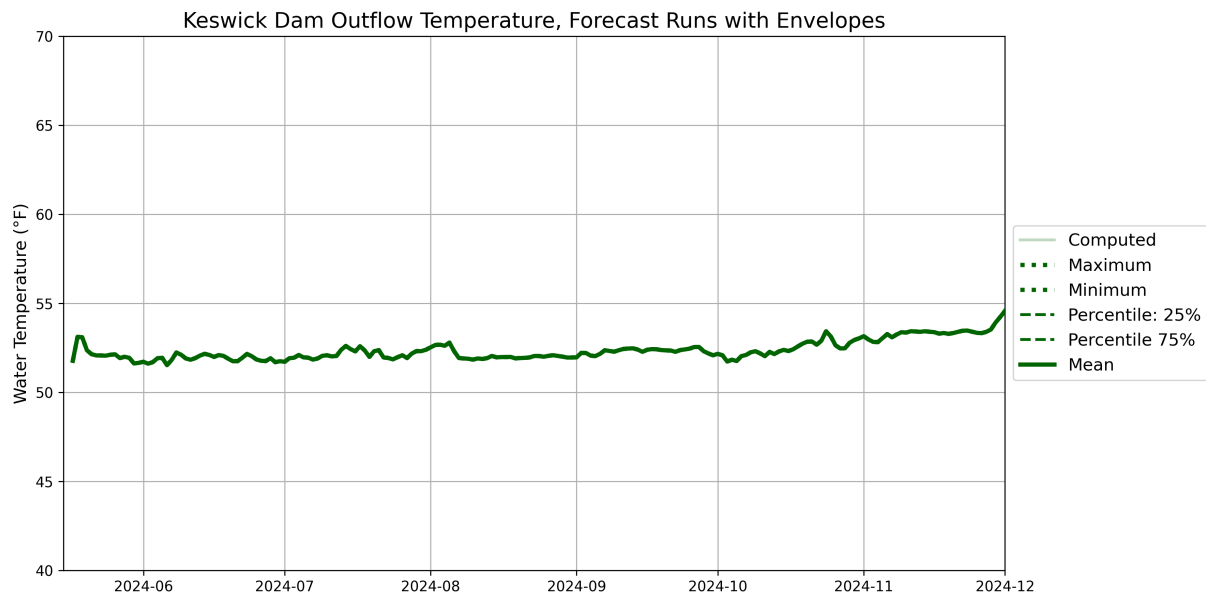


Figure 3. Keswick Dam outflow temperature, forecast runs (variable input) with percentile envelopes computed. ResSim.

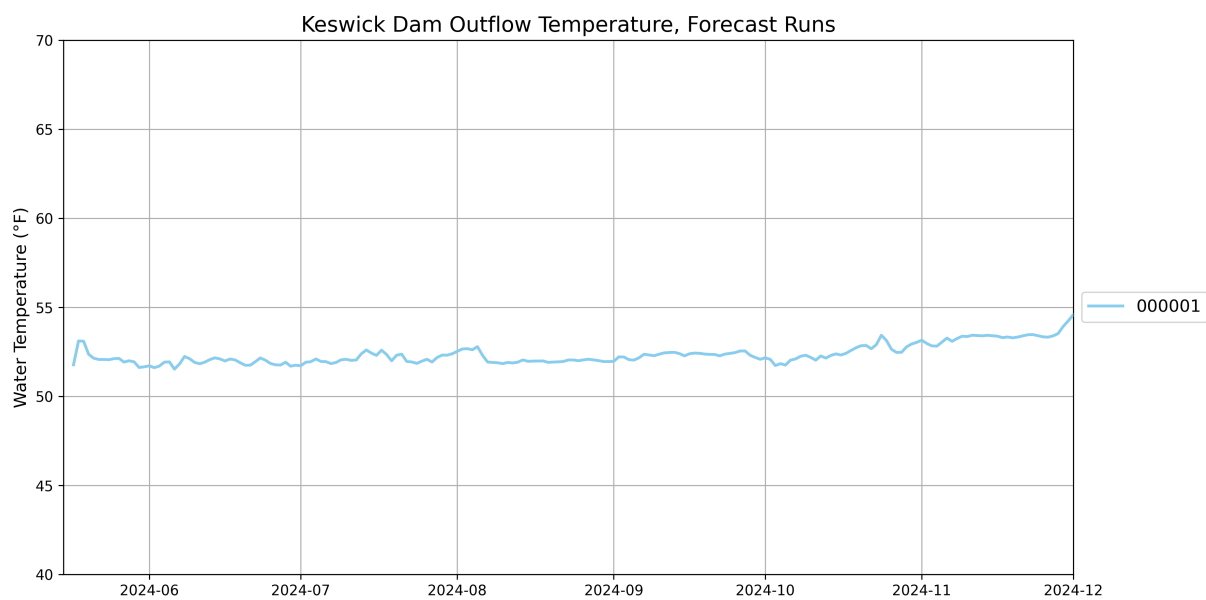


Figure 4. Keswick Dam outflow temperature, forecast runs (variable input), by iteration. ResSim.

Table 3. Keswick Dam outflow temperature, iteration statistical summary, May - Nov 2024 (°F). ResSim.

Iteration	Maximum	Mean	Minimum
000001	54.6	52.4	51.5

Sacramento River above Clear Creek (CCR) Temperature Summary

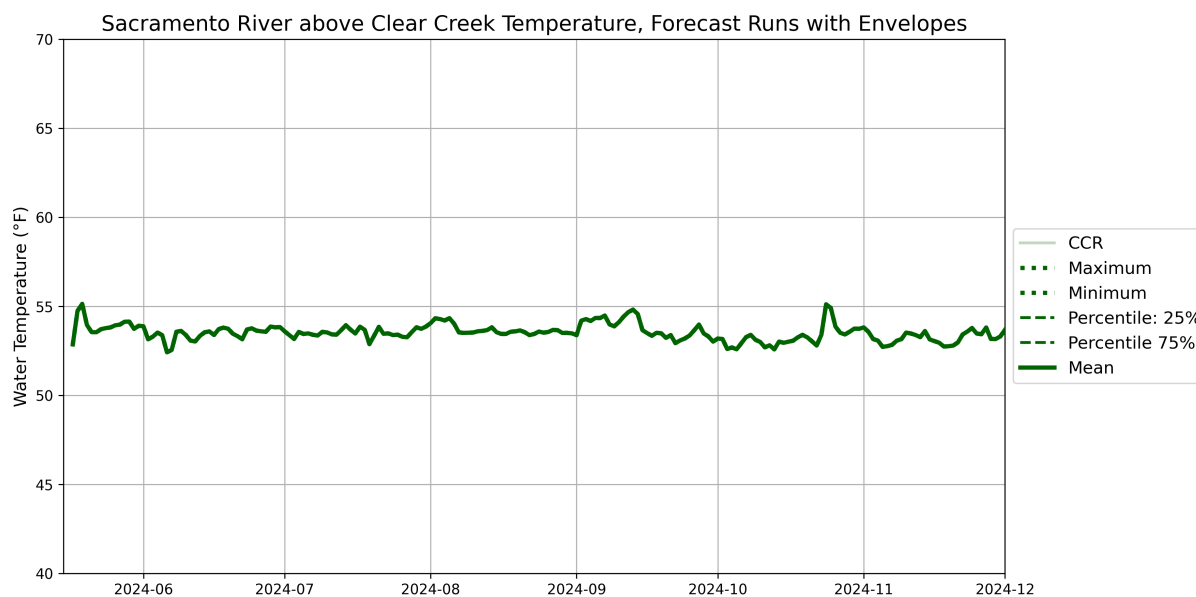


Figure 5. Sacramento River above Clear Creek (CCR) temperature, forecast runs (variable input) with percentile envelopes computed. ResSim.

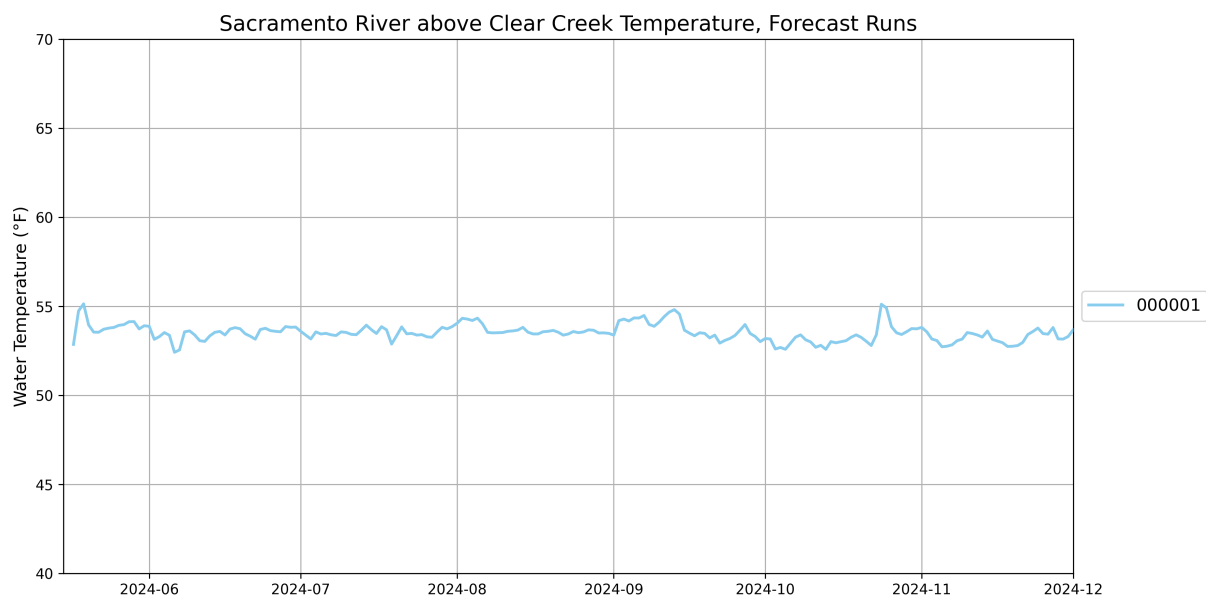


Figure 6. Sacramento River above Clear Creek temperature, forecast runs (variable input), by iteration. ResSim.

Table 4. Sacramento River above Clear Creek tempeature, iteration statistical summary, May - Nov 2024 (°F). ResSim.

Iteration	Maximum	Mean	Minimum
000001	55.1	53.5	52.4

Trinity Lake Outflow Temperature Summary

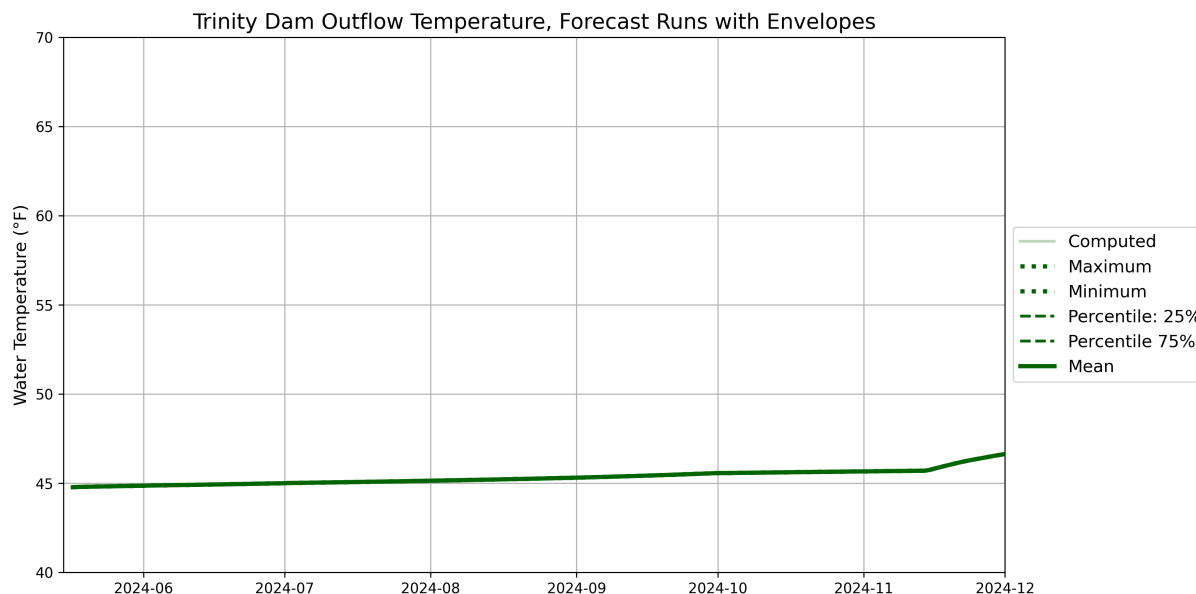


Figure 7. Trinity Dam outflow temperature, forecast runs (variable input) with percentile envelopes computed. ResSim.

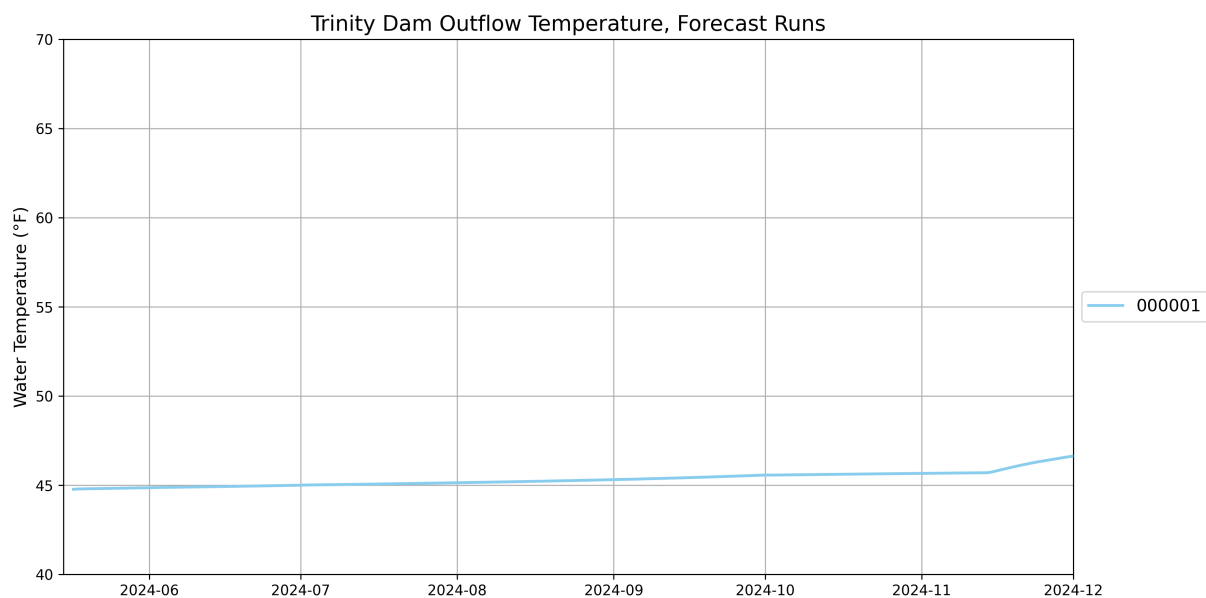


Figure 8. Trinity Dam outflow temperature, forecast runs (variable input), by iteration. ResSim.

**Table 5. Trinity Dam outflow temperature, iteration statistical summary, May - Nov 2024 (°F).
ResSim.**

Iteration	Maximum	Mean	Minimum
000001	46.6	45.3	44.8

Lewiston Lake Outflow Temperature Summary

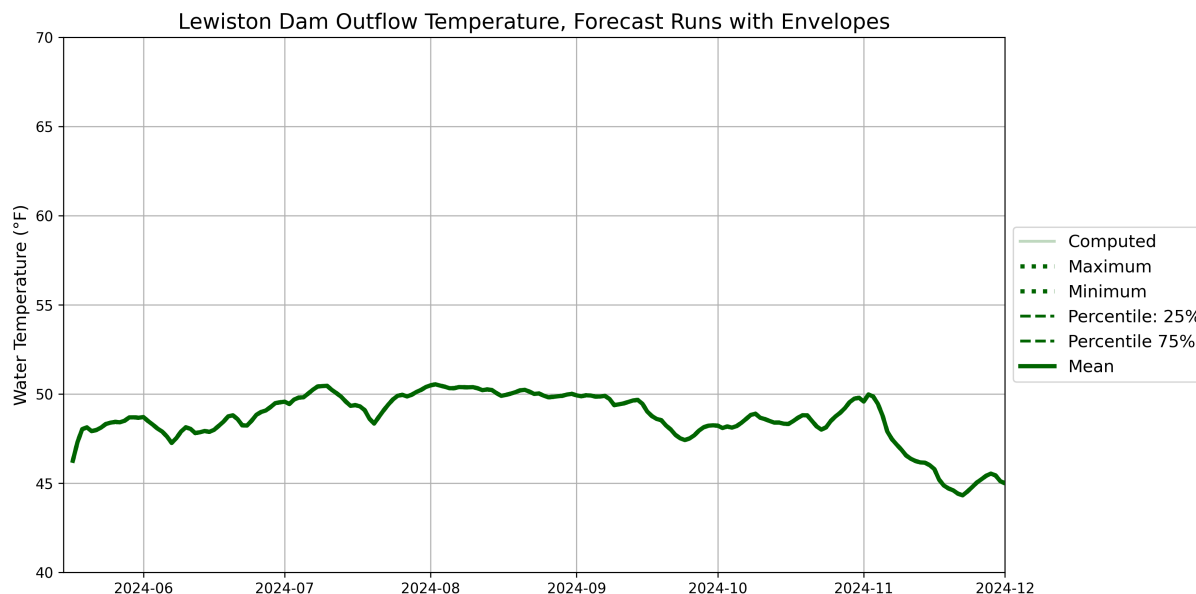


Figure 9. Lewiston Dam outflow temperature, forecast runs (variable input) with percentile envelopes computed. ResSim.

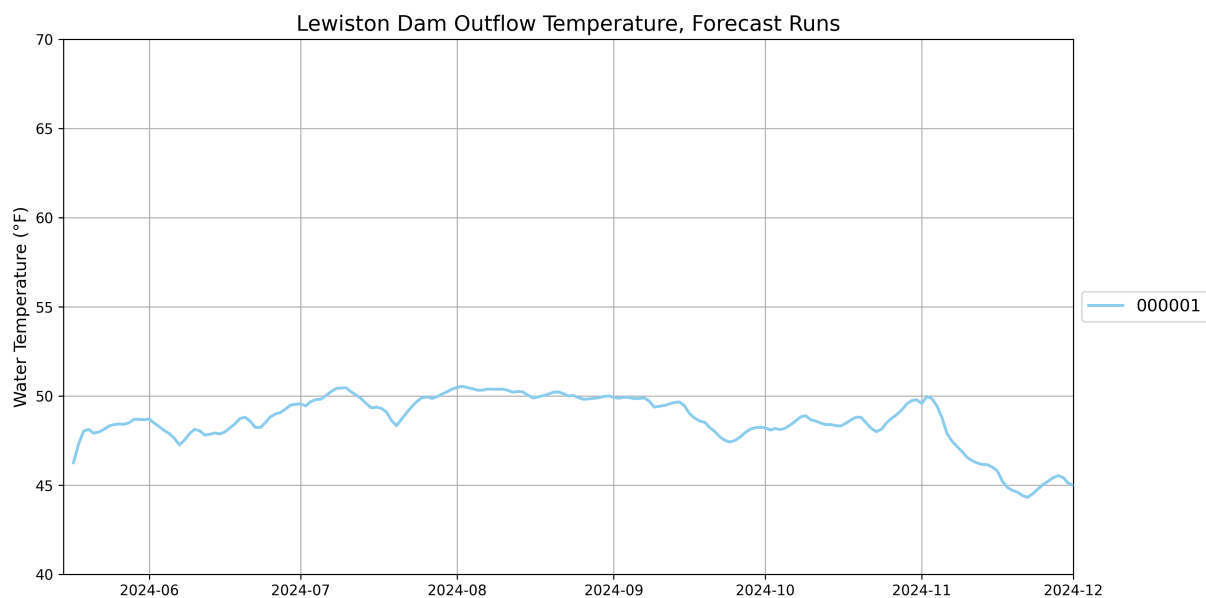


Figure 10. Lewiston Dam outflow temperature, forecast runs (variable input), by iteration. ResSim.

Table 6. Lewiston Dam outflow temperature, iteration statistical summary, May - Nov 2024 (°F). ResSim.

Iteration	Maximum	Mean	Minimum
000001	50.5	48.6	44.3

Whiskeytown Lake Outflow Temperature Summary

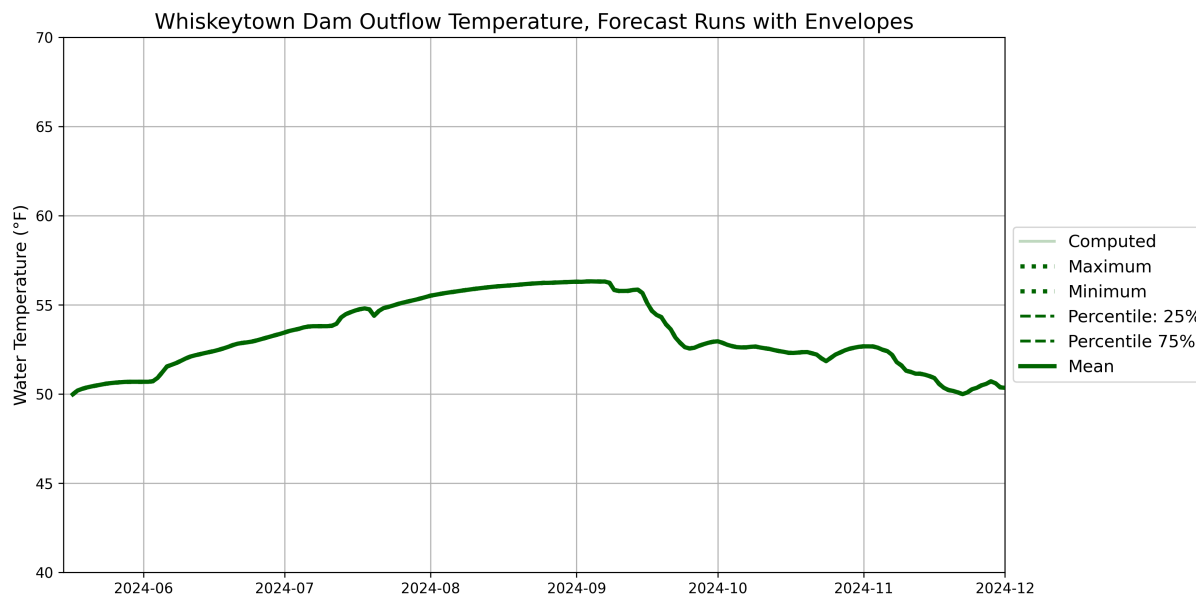


Figure 11. Whiskeytown Dam outflow temperature, forecast runs (variable input) with percentile envelopes computed. ResSim.

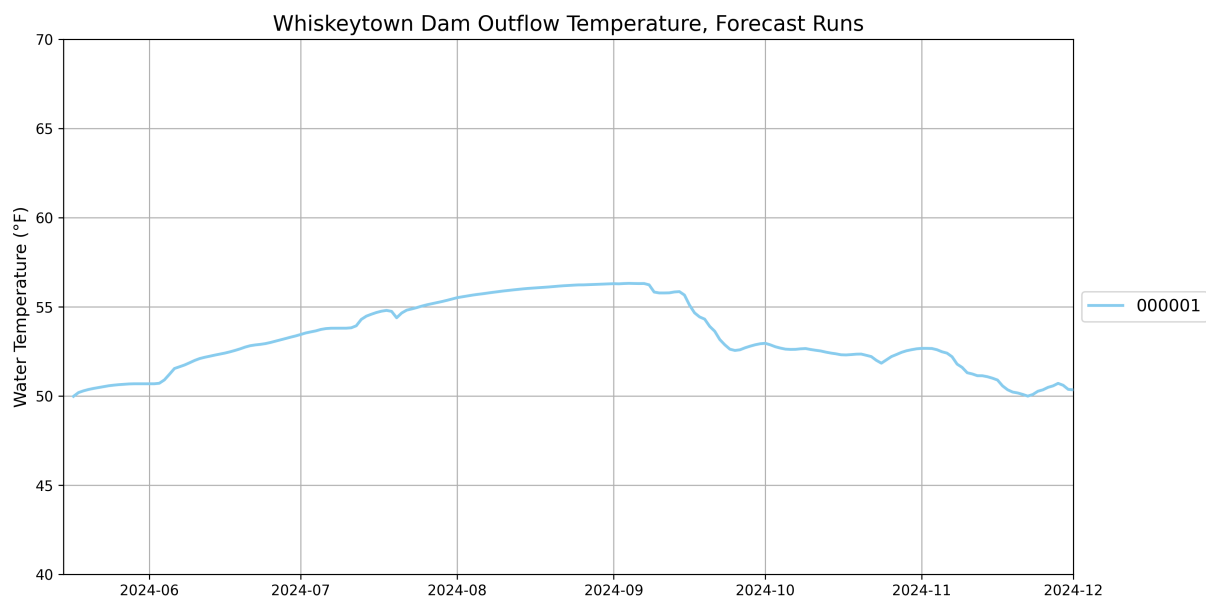


Figure 12. Whiskeytown Dam outflow temperature, forecast runs (variable input), by iteration. ResSim.

Table 7. Whiskeytown Dam outflow temperature iteration statistical summary, May - Nov 2024 (°F). ResSim.

Iteration	Maximum	Mean	Minimum
000001	56.3	53.3	50.0

Iterations: CE-QUAL-W2

Iteration 000001: Shasta Lake Outflow

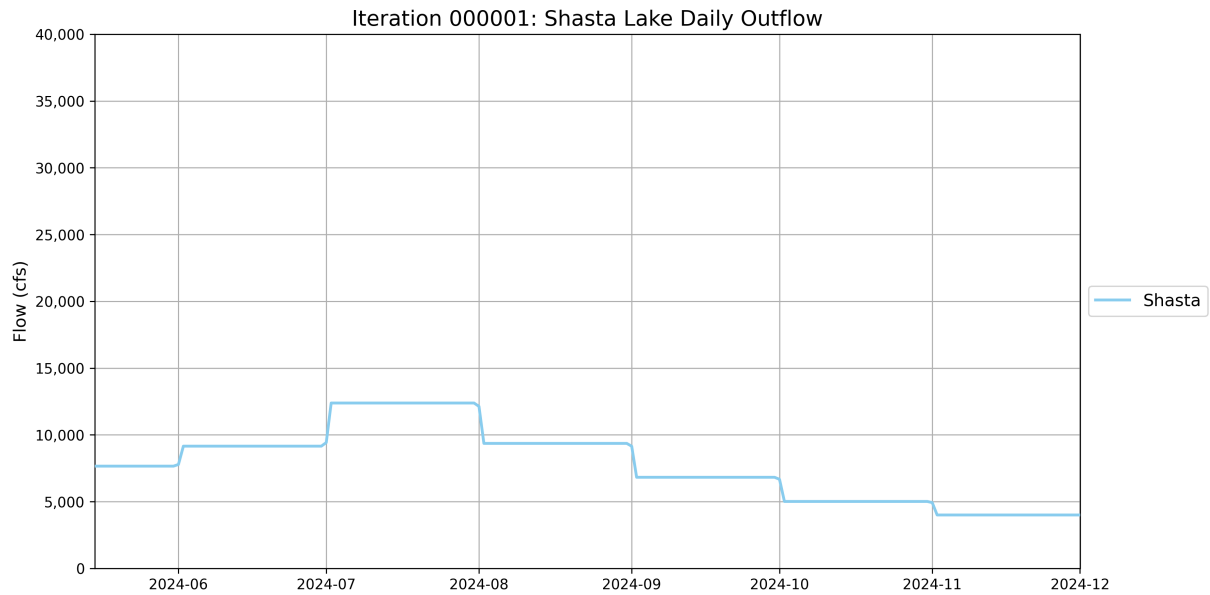


Figure 13. Iteration 000001: Shasta Lake daily outflow, forecast 2024. CE-QUAL-W2.

Table 8. Iteration 000001: Shasta Lake daily outflow statistical summary, May - Nov 2024 (cfs). CE-QUAL-W2.

Location	Maximum	Mean	Minimum
Shasta	12,383	7,791	3,999

Table 9. Iteration 000001: Shasta Lake monthly average outflow, 2024 (cfs). CE-QUAL-W2.

Month	Shasta (cfs)
Apr	nan
May	7,657
Jun	9,107
Jul	12,288
Aug	9,449
Sep	6,899
Oct	5,064

Iteration 000001: Shasta Lake Daily Outflow Water Temperature

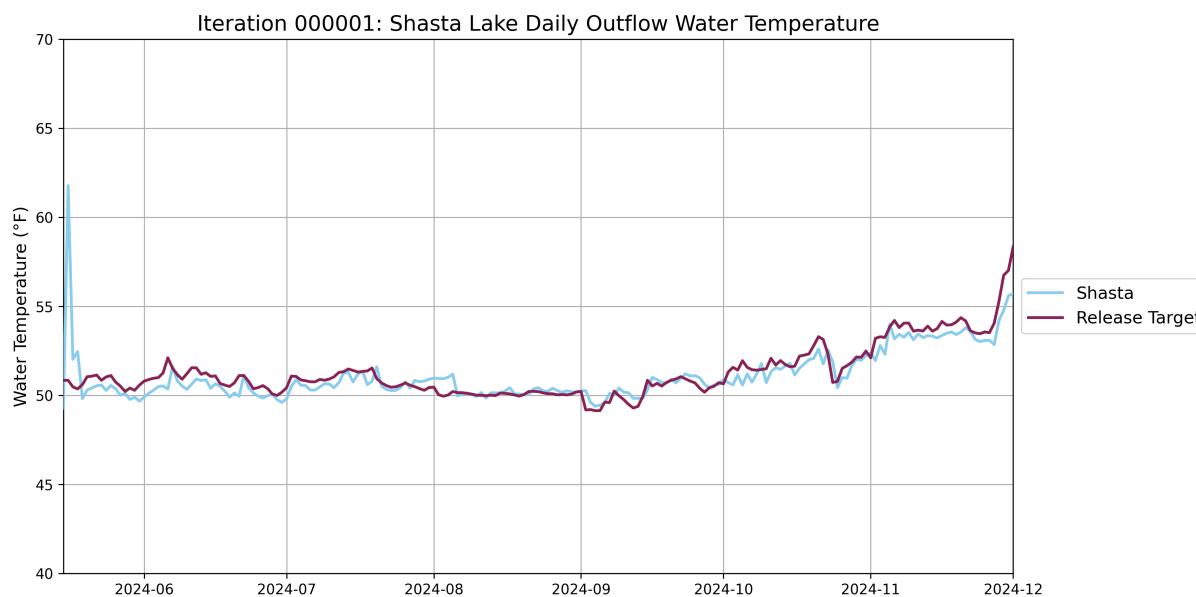


Figure 14. Iteration 000001: Shasta Lake daily outflow temperature, forecast 2024. CE-QUAL-W2.

Table 10. Iteration 000001: Shasta Lake daily outflow temperature statistical summary, May - Nov 2024 (°F). CE-QUAL-W2.

Location	Maximum	Mean	Minimum
Shasta	61.8	51.1	49.3
Release Target	58.3	51.3	49.1

Table 11. Iteration 000001: Shasta Lake monthly average outflow temperature, 2024 (°F). CE-QUAL-W2.

Month	Shasta (°F)	Release Target (°F)
Apr	nan	nan
May	51.1	50.7
Jun	50.4	50.9
Jul	50.7	50.9
Aug	50.3	50.1
Sep	50.4	50.2
Oct	51.4	51.8

Iterations: ResSim

Iteration 000001: Sacramento River System Flow

Sacramento River system results are presented as outflow from Keswick Reservoir and flow in the Sacramento River above Clear Creek (CCR).

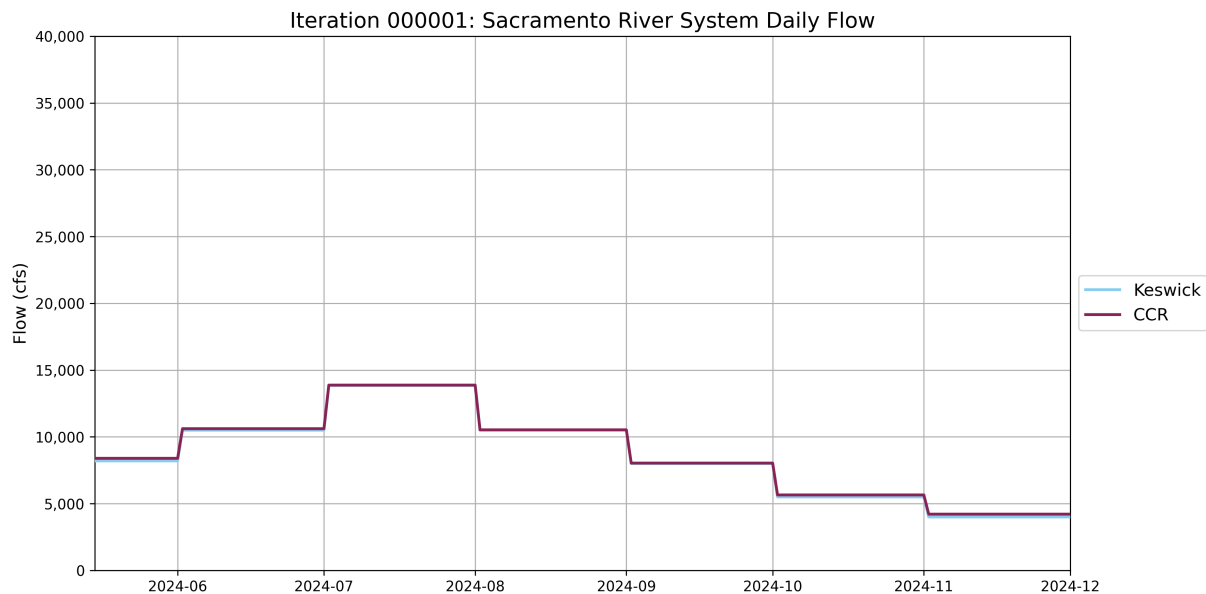


Figure 15. Iteration 000001: Sacramento River system daily flow, forecast 2024. ResSim.

Table 12. Iteration 000001: Sacramento River system daily flow statistical summary, May - Nov 2024 (cfs). ResSim.

Location	Maximum	Mean	Minimum
Keswick	13,850	8,696	4,000
CCR	13,875	8,798	4,211

Table 13. Iteration 000001: Sacramento River system monthly average flow, 2024 (cfs). ResSim.

Month	Keswick (cfs)	CCR (cfs)
Apr	nan	nan
May	8,200	8,391
Jun	10,423	10,539
Jul	13,742	13,770
Aug	10,608	10,634
Sep	8,083	8,119
Oct	5,581	5,728

Iteration 000001: Trinity River System Flow

Trinity River system results are presented as outflow from Lewiston Lake and flow in the Trinity River at Limekiln Gulch, Douglas City, and Helena.

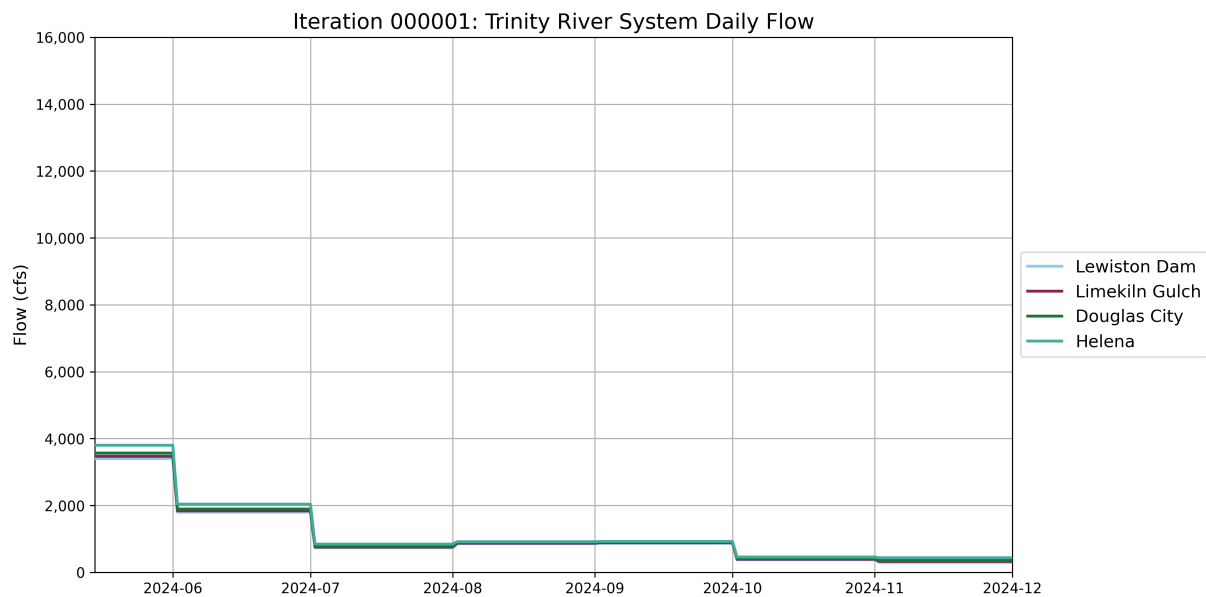


Figure 16. Iteration 000001: Trinity River system daily flow, forecast 2024. ResSim.

Table 14. Iteration 000001: Trinity River system daily flow statistical summary, May - Nov 2024 (cfs). ResSim.

Location	Maximum	Mean	Minimum
Lewiston	3,403	1,051	300
Limekiln Gulch	3,469	1,076	325
Douglas City	3,566	1,110	357
Helena	3,800	1,190	436

Table 15. Iteration 000001: Trinity River system monthly average flow, 2024 (cfs). ResSim.

Month	Lewiston Dam (cfs)	Limekiln Gulch (cfs)	Douglas City (cfs)	Helena (cfs)
Apr	nan	nan	nan	nan
May	3,403	3,469	3,566	3,800
Jun	1,853	1,893	1,948	2,098
Jul	769	788	813	882
Aug	853	867	884	914
Sep	869	883	901	924
Oct	389	407	430	473

Iteration 000001: Sacramento River System Water Temperature

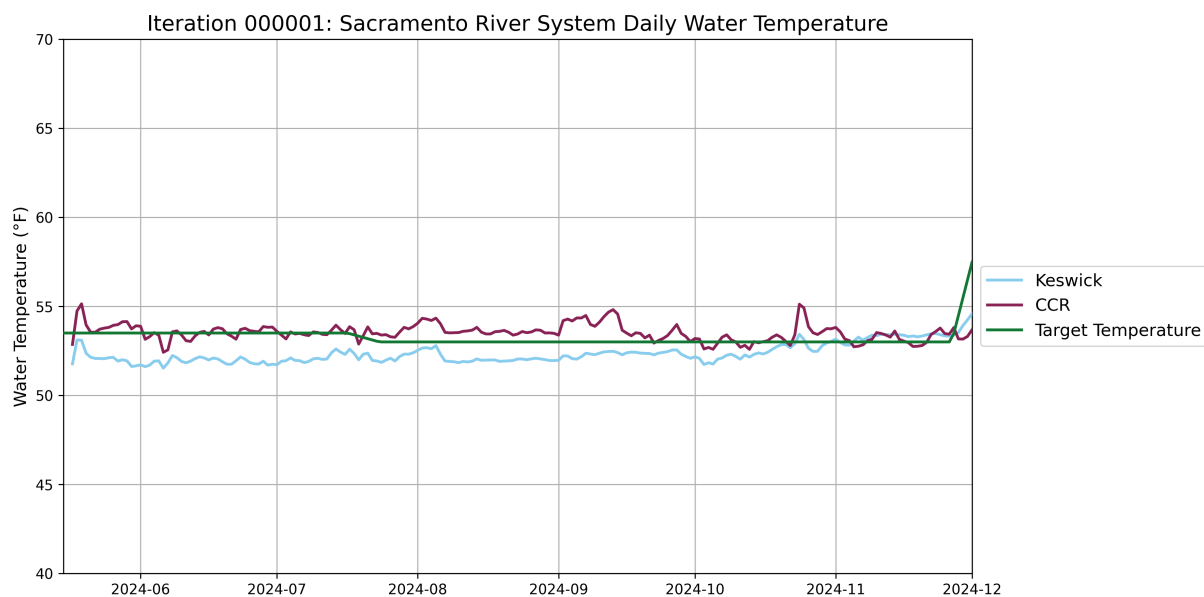


Figure 17. Iteration 000001: Sacramento River system daily water temperature, forecast 2024. ResSim.

Table 16. Iteration 000001: Sacramento River system daily water temperature statistical summary, May - Nov 2024 (°F). ResSim.

Location	Maximum	Mean	Minimum
Keswick	54.6	52.4	51.5
CCR	55.1	53.5	52.4
Target	57.5	53.2	53.0

Table 17. Iteration 000001: Sacramento River system monthly average water temperature, 2024 (°F). ResSim.

Month	Keswick (°F)	CCR (°F)	Target Temp (°F)
Apr	nan	nan	nan
May	52.1	53.9	53.5
Jun	51.9	53.5	53.5
Jul	52.1	53.5	53.3
Aug	52.1	53.7	53.0
Sep	52.3	53.8	53.0
Oct	52.4	53.3	53.0

Iteration 000001: Trinity River System Water Temperature

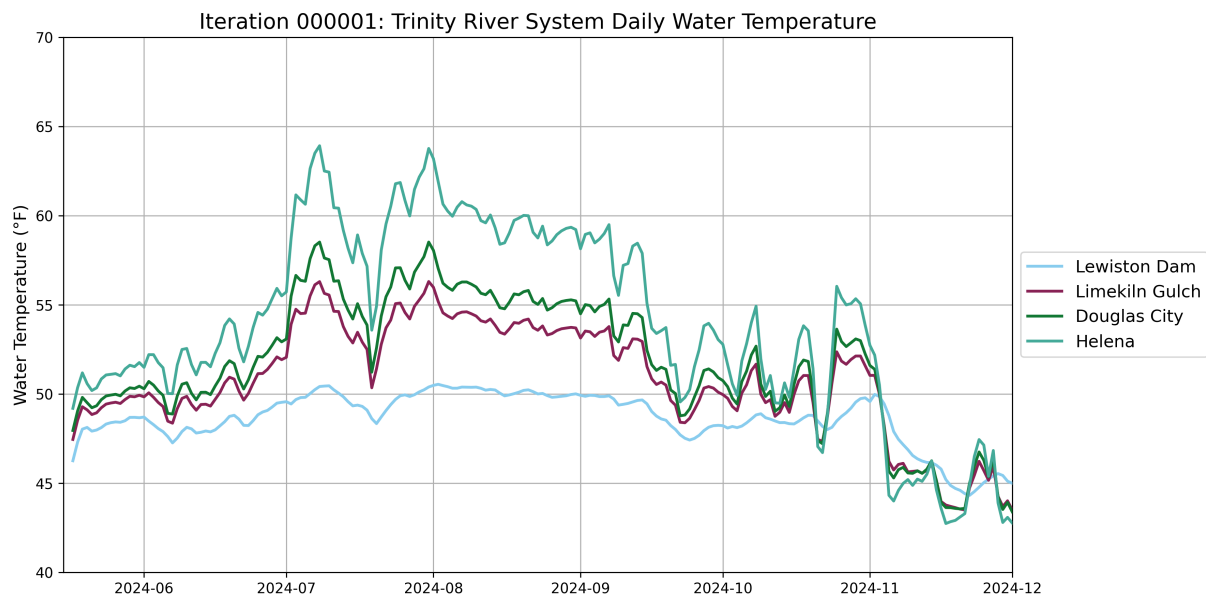


Figure 18. Iteration 000001: Trinity River system water temperature, 2024. ResSim.

Table 18. Iteration 000001: Trinity River system water temperature statistical summary, May - Nov 2024 (°F). ResSim.

Location	Maximum	Mean	Minimum
Lewiston	50.5	48.6	44.3
Limekiln Gulch	56.3	50.8	43.5
Douglas City	58.5	51.7	43.4
Helena	63.9	54.0	42.7

Table 19. Iteration 000001: Trinity River system monthly average water temperature, 2024 (°F). ResSim.

Month	Lewiston Dam (°F)	Limekiln Gulch (°F)	Douglas City (°F)	Helena (°F)
Apr	nan	nan	nan	nan
May	48.1	3,469	49.7	50.9
Jun	48.3	1,893	50.9	52.7
Jul	49.7	788	55.9	60.1
Aug	50.2	867	55.6	59.8
Sep	48.9	883	52.4	55.1
Oct	48.6	407	50.8	52.1