

# 2023 Water Quality at Pelton Round Butte

Lori Campbell  
July 2024



# Topics

- Water quality management and monitoring
- Temperature management
- Project dissolved oxygen and pH



# PRB Water Quality Program

- Compliance
- Monitoring
- Reduce impacts of Project
- Adaptive management
- Benefit fish species –  
reservoirs and downstream



# Water Quality Sampling

## Monthly sampling

- Tributary inflows
- Depth profiles in reservoirs
- Tailraces and lower river

## Continuous stations

- Round Butte and Reregulating tailraces

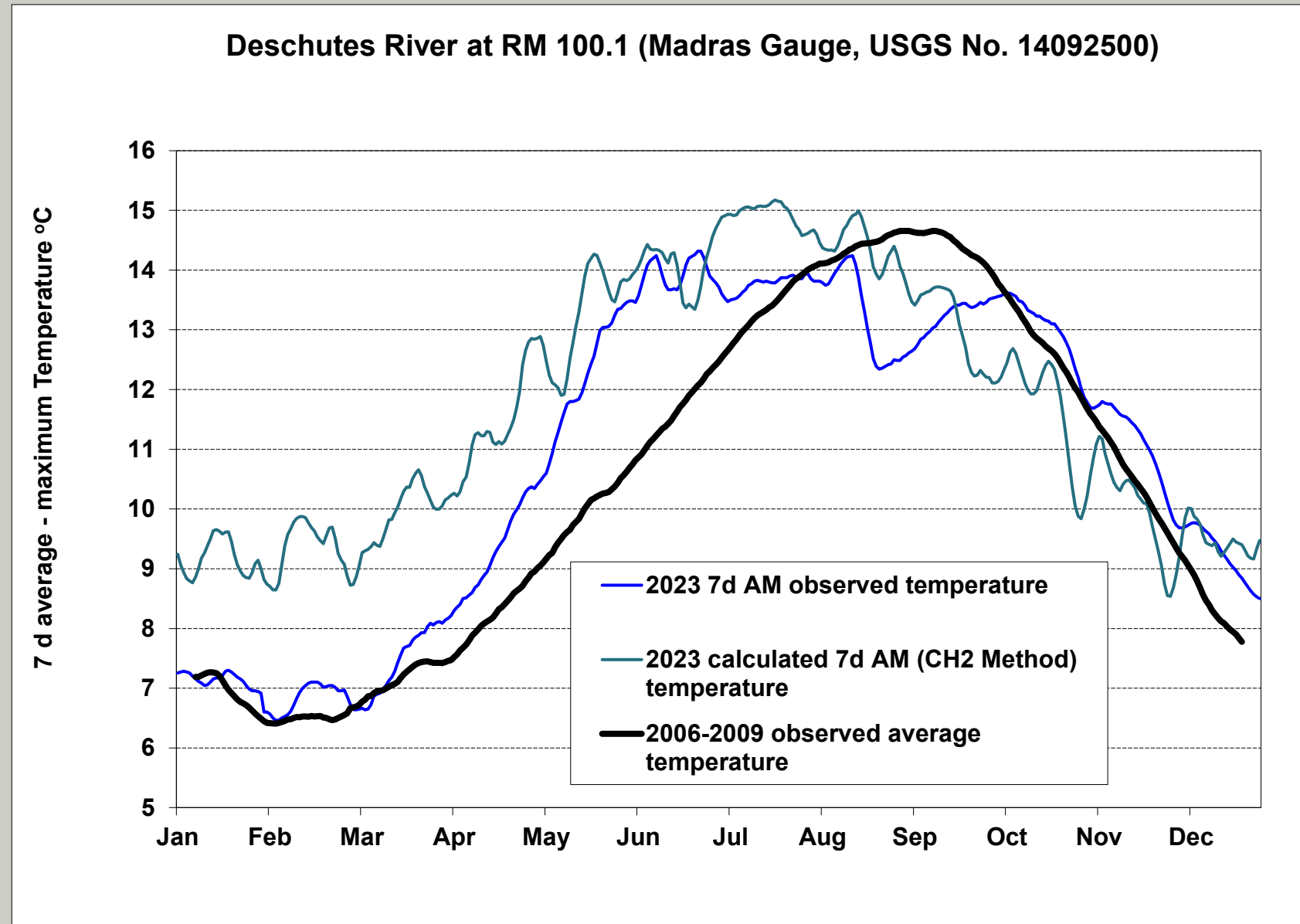
## Data loggers

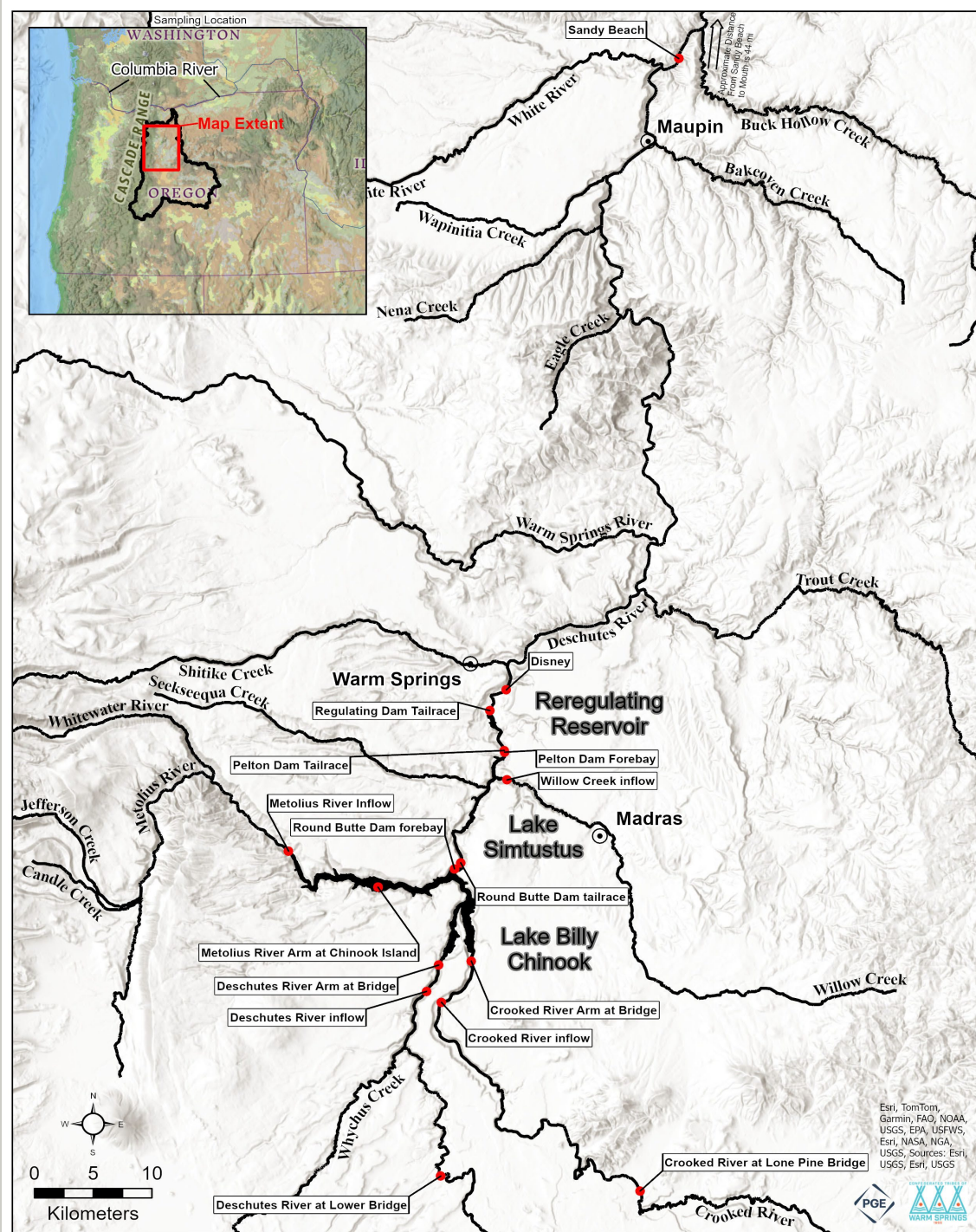
- Tributaries
- Reservoir profiles
- Lower river



# Without Project Temperature

- Predicted temperature at the discharge point if the project were not in place
- Includes temperatures of combined tributaries, air temperatures
- Temperatures at Madras gauge compared to calculated temperatures





## Tributaries

Solar radiation, or lack of radiation, on tributaries; primarily drives calculated (WPT) temperature during spring.

## Reservoirs

Store heat, or lack of heat, in the water.



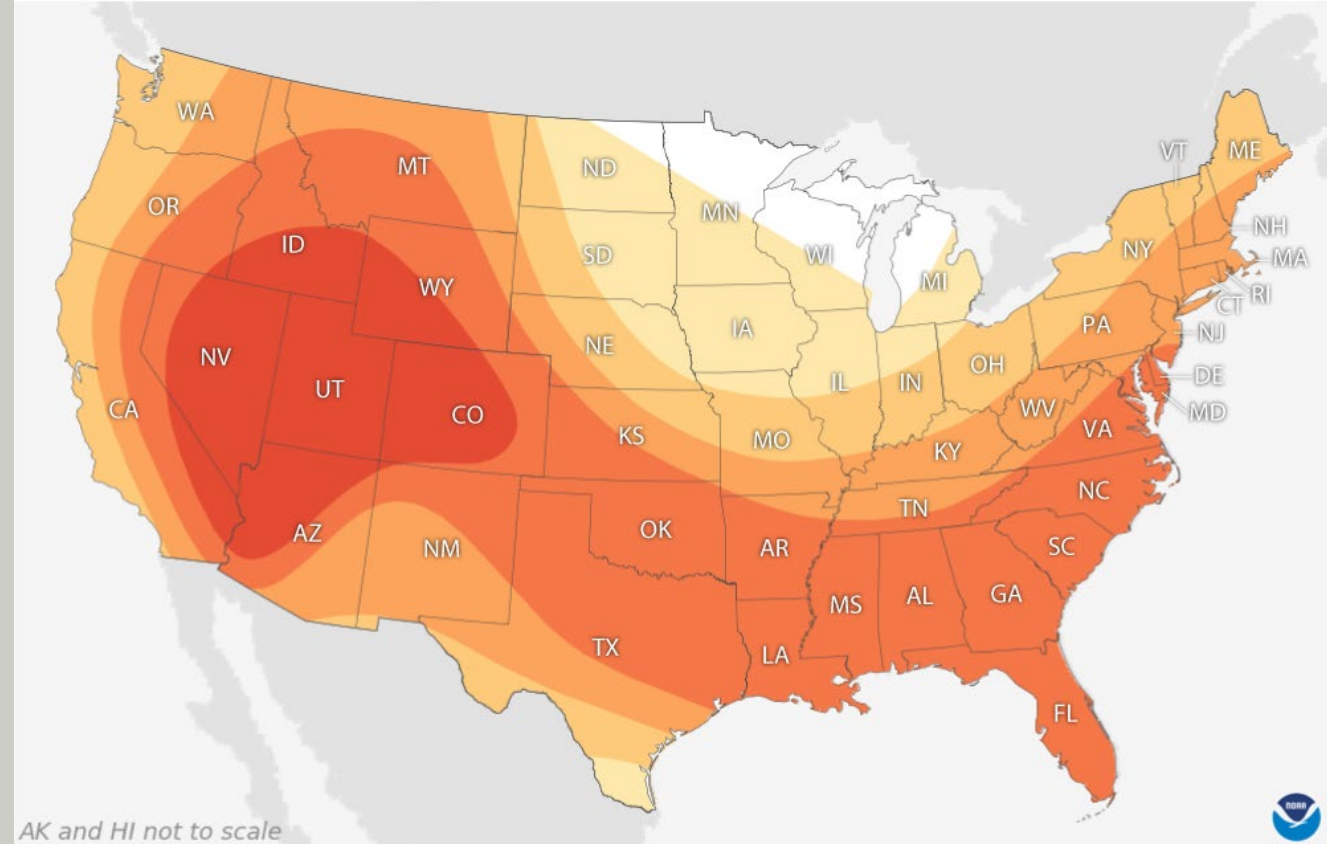
# Recent weather patterns

Recent weather has been much warmer in winter and summer.

Tributary flows have been low.



Temperature outlook for July 2024



AK and HI not to scale



Probability (percent chance)		
Below Normal	Near Normal	Above Normal
Leaning Below	33-40%	33-40%
	40-50%	40-50%
	50-60%	50-60%
Likely Below	60-70%	60-70%
	70-80%	70-80%
	80-90%	80-90%
	90-100%	90-100%
	Equal Chances	

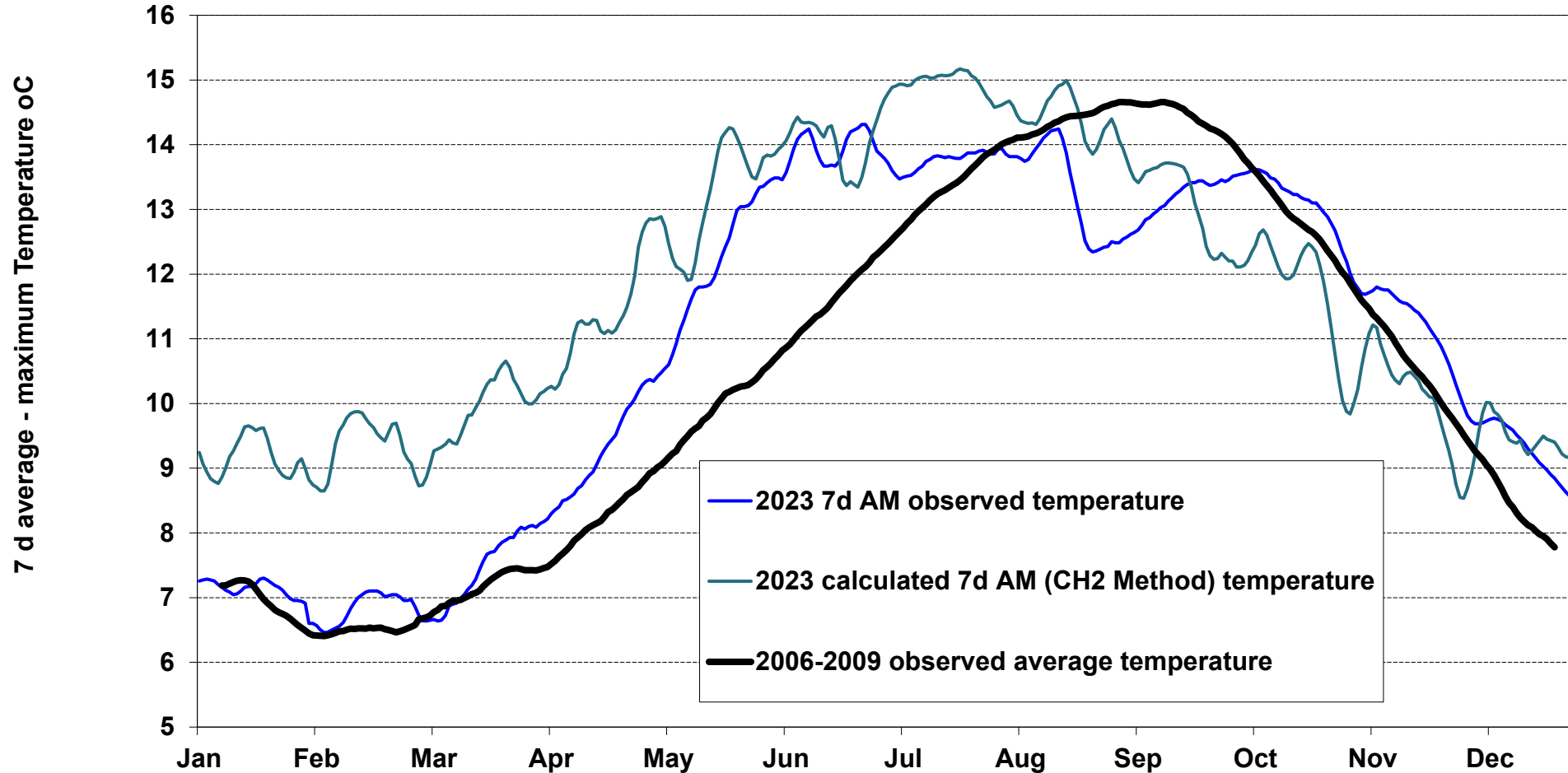
Temperature Outlook for July 2024  
Issued 30 Jun 2024

NWS Climate Prediction Center  
Map by NOAA Climate.gov

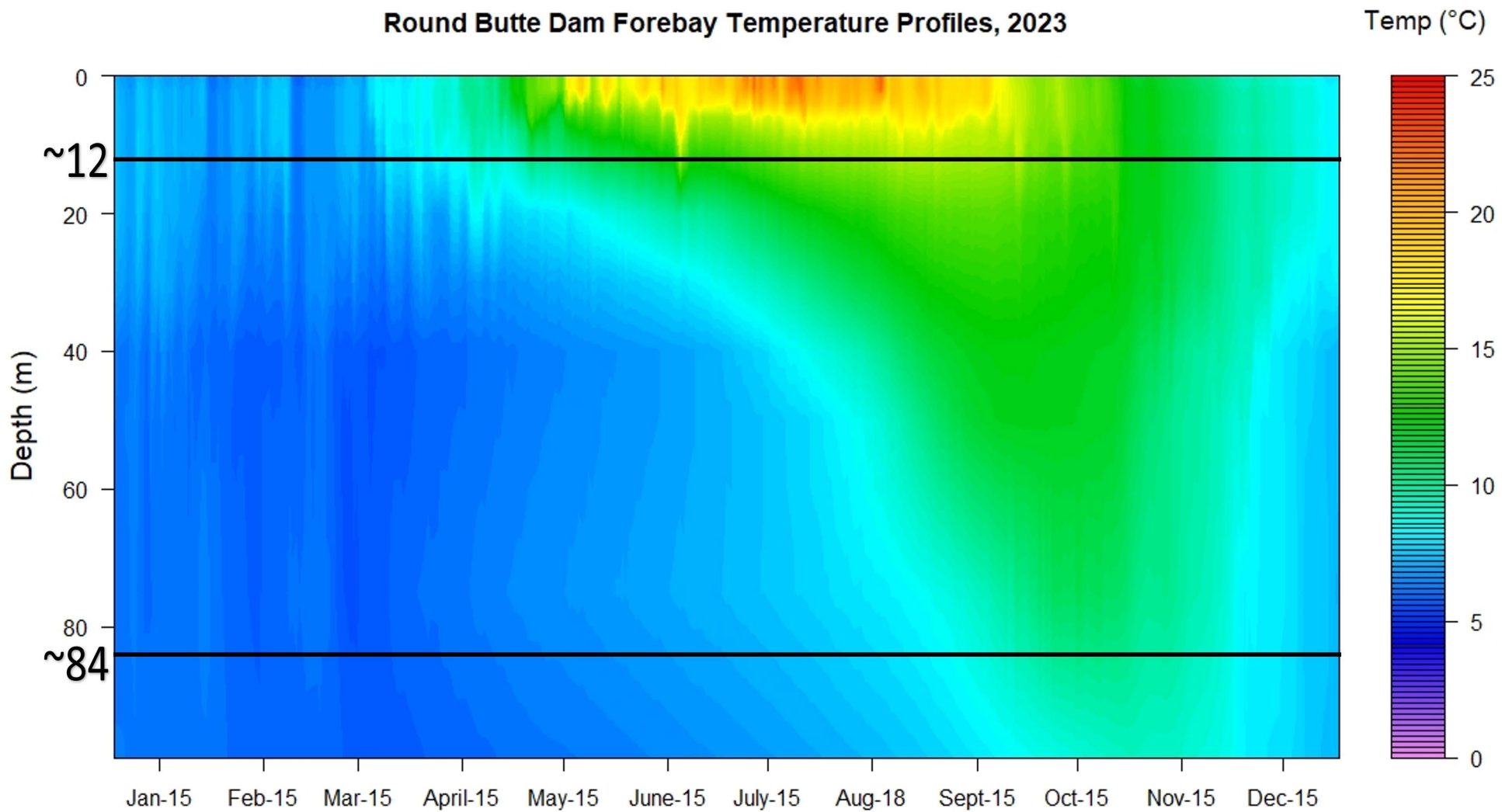


# 2023 Discharge Temperatures

Deschutes River at RM 100.1 (Madras Gauge, USGS No. 14092500)



Round Butte Dam Forebay Temperature Profiles, 2023

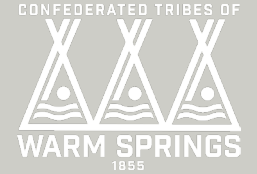
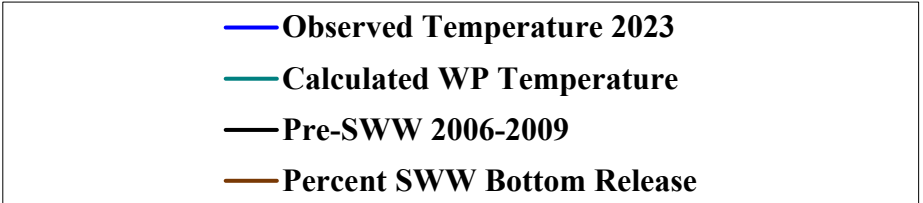
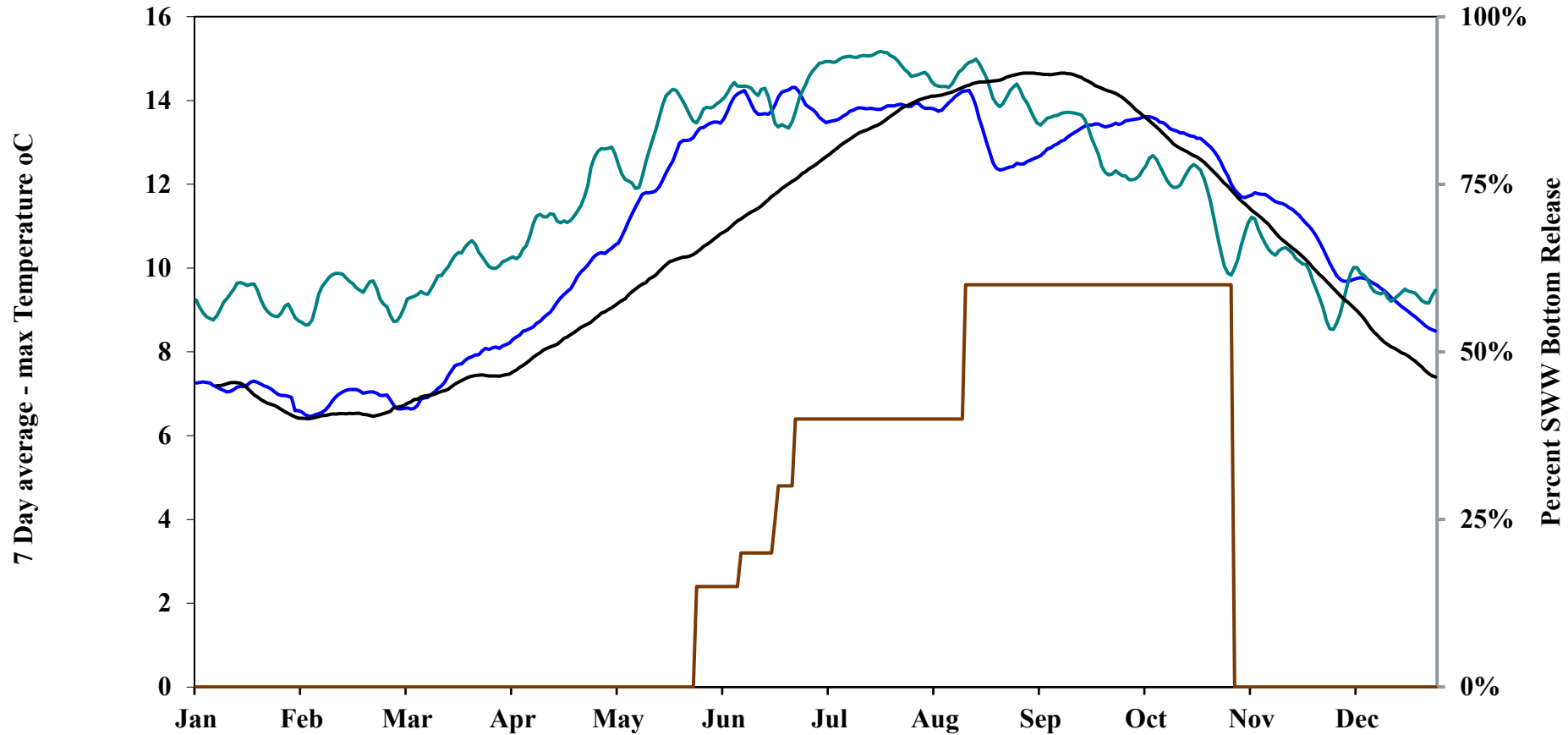


# 2023 Round Butte Dam forebay temperatures

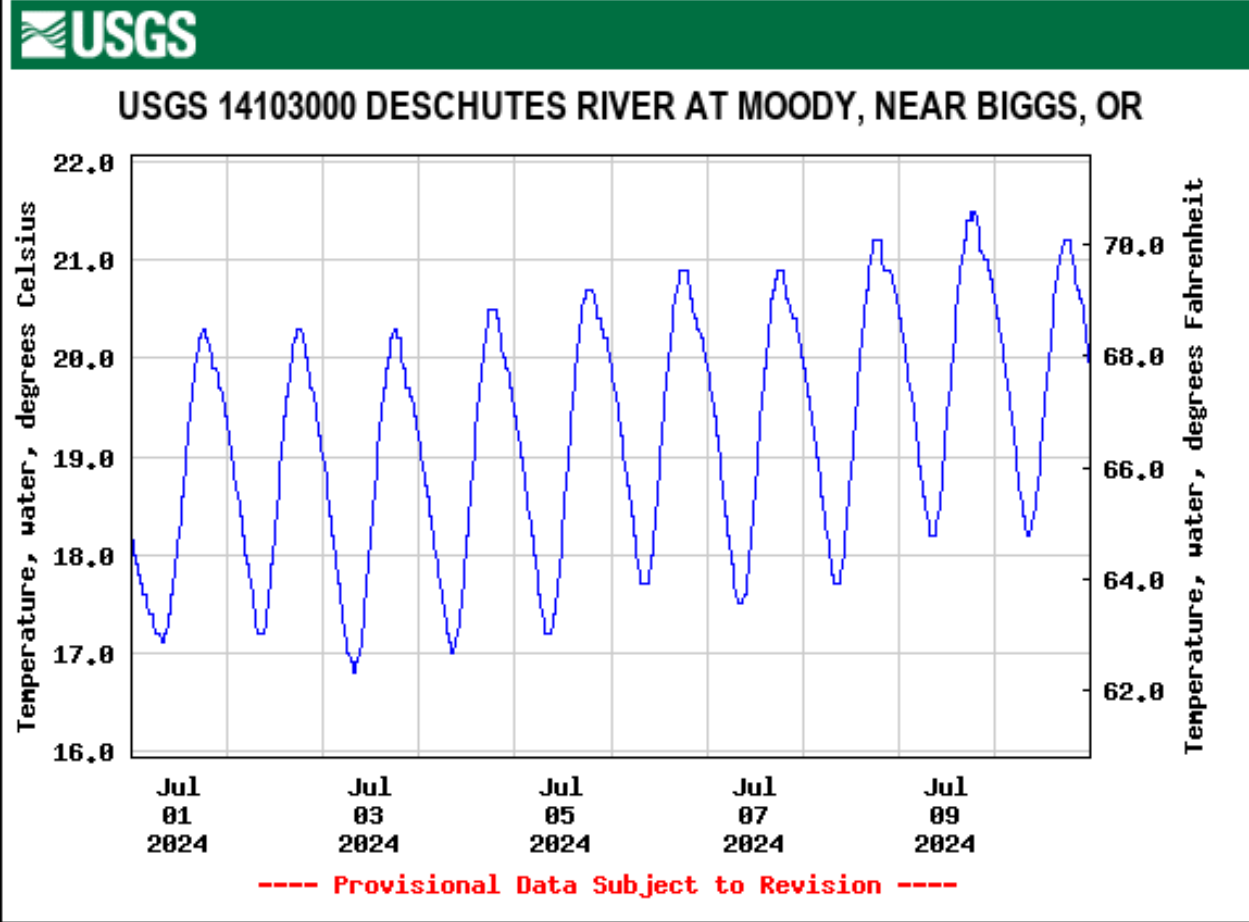
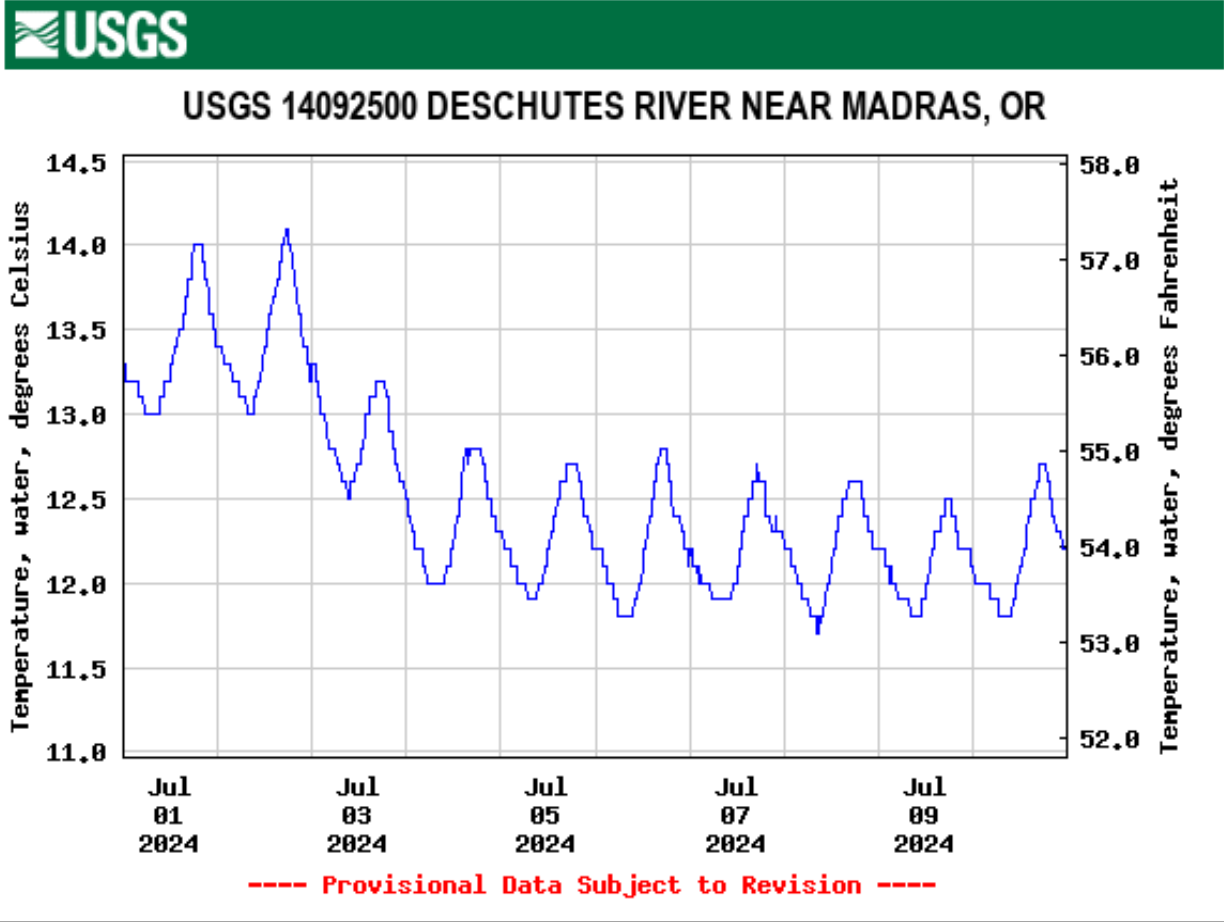


# 2023 Discharge Temperatures

Deschutes River at RM 100.1 (Madras Gauge, USGS No. 14092500)



# 2024 discharge (Madras) and Moody temperatures



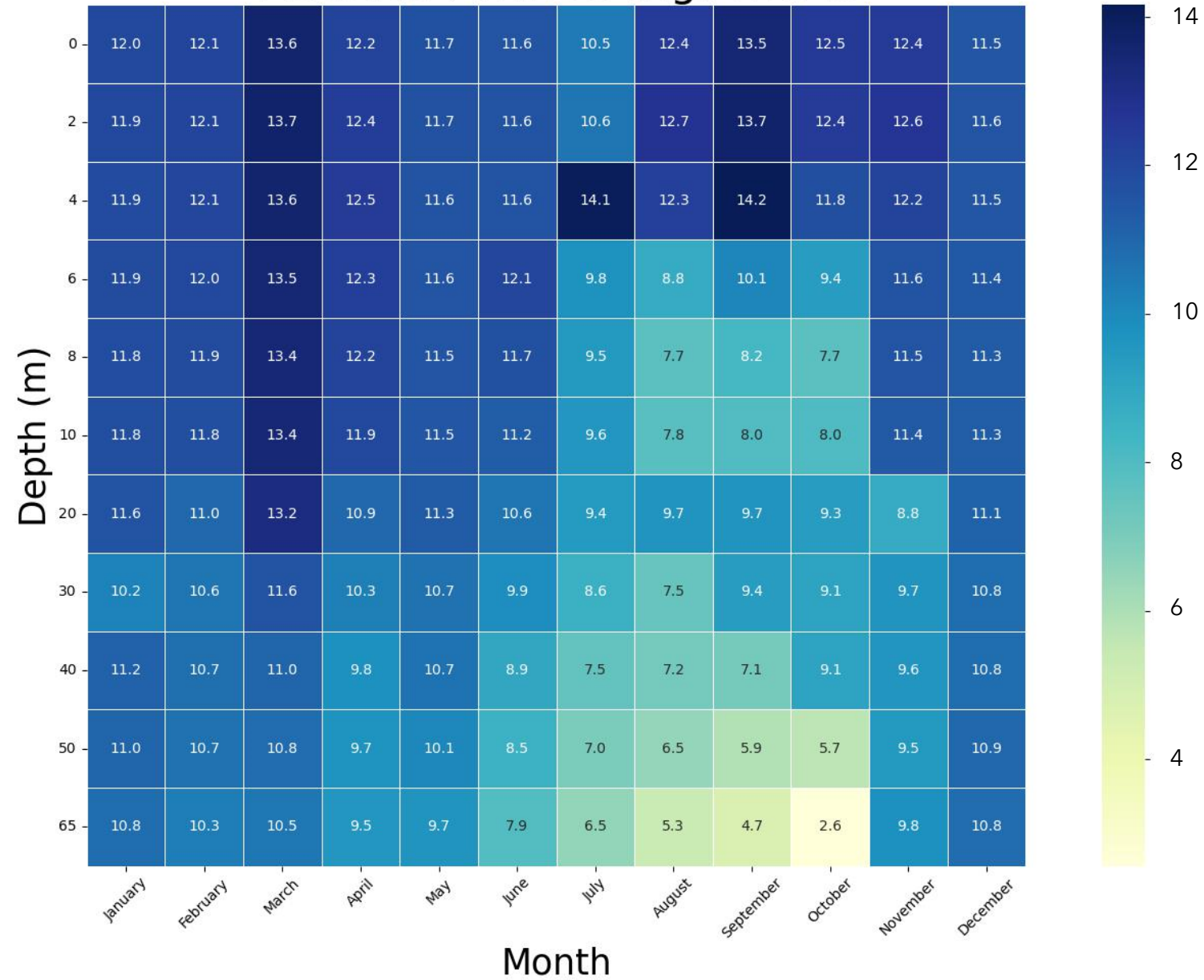
**SWW was shutdown July 1, due to mechanical issue, and moved to 60% bottom water withdrawal.**



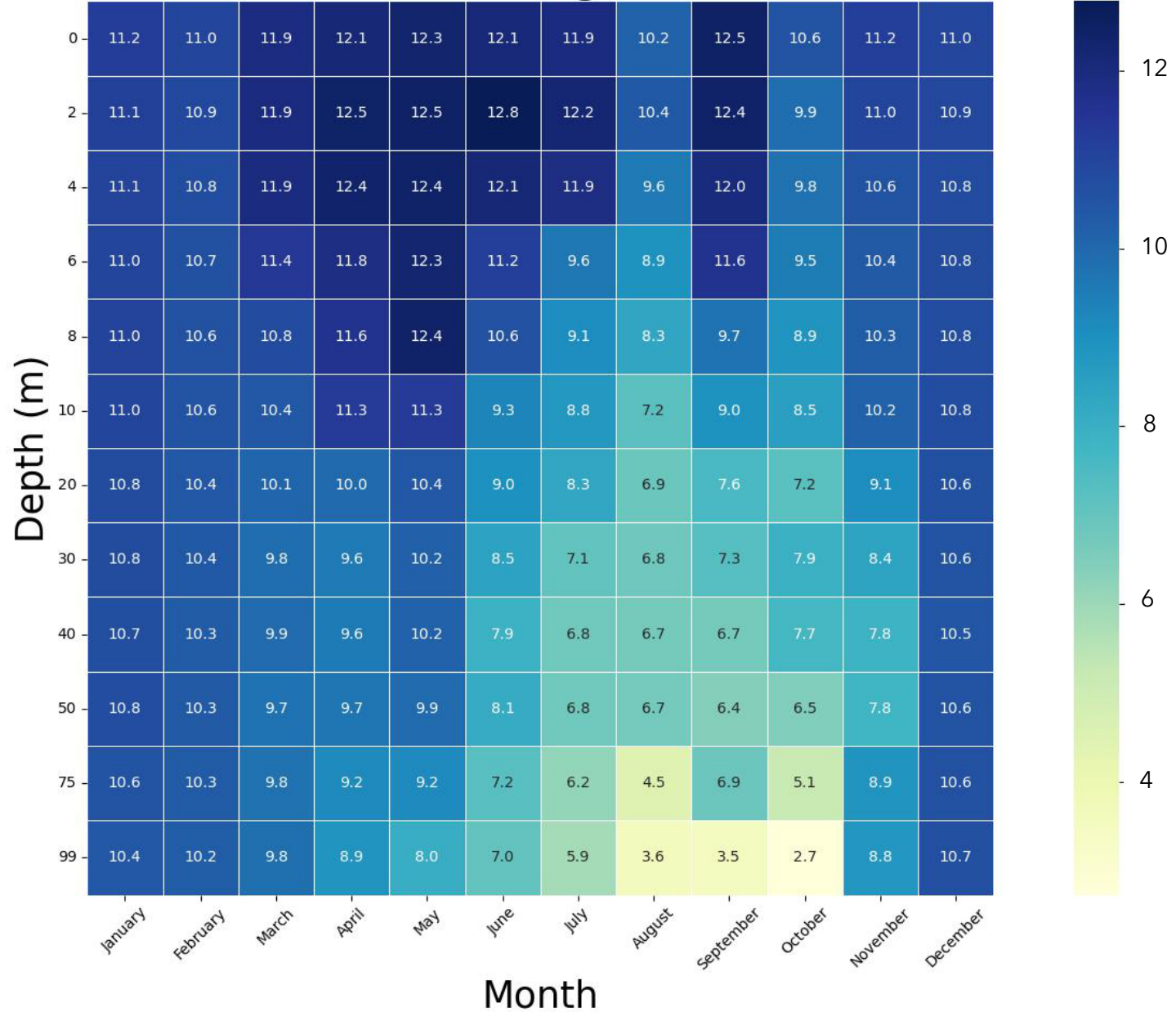
# 2023 Dissolved Oxygen and pH



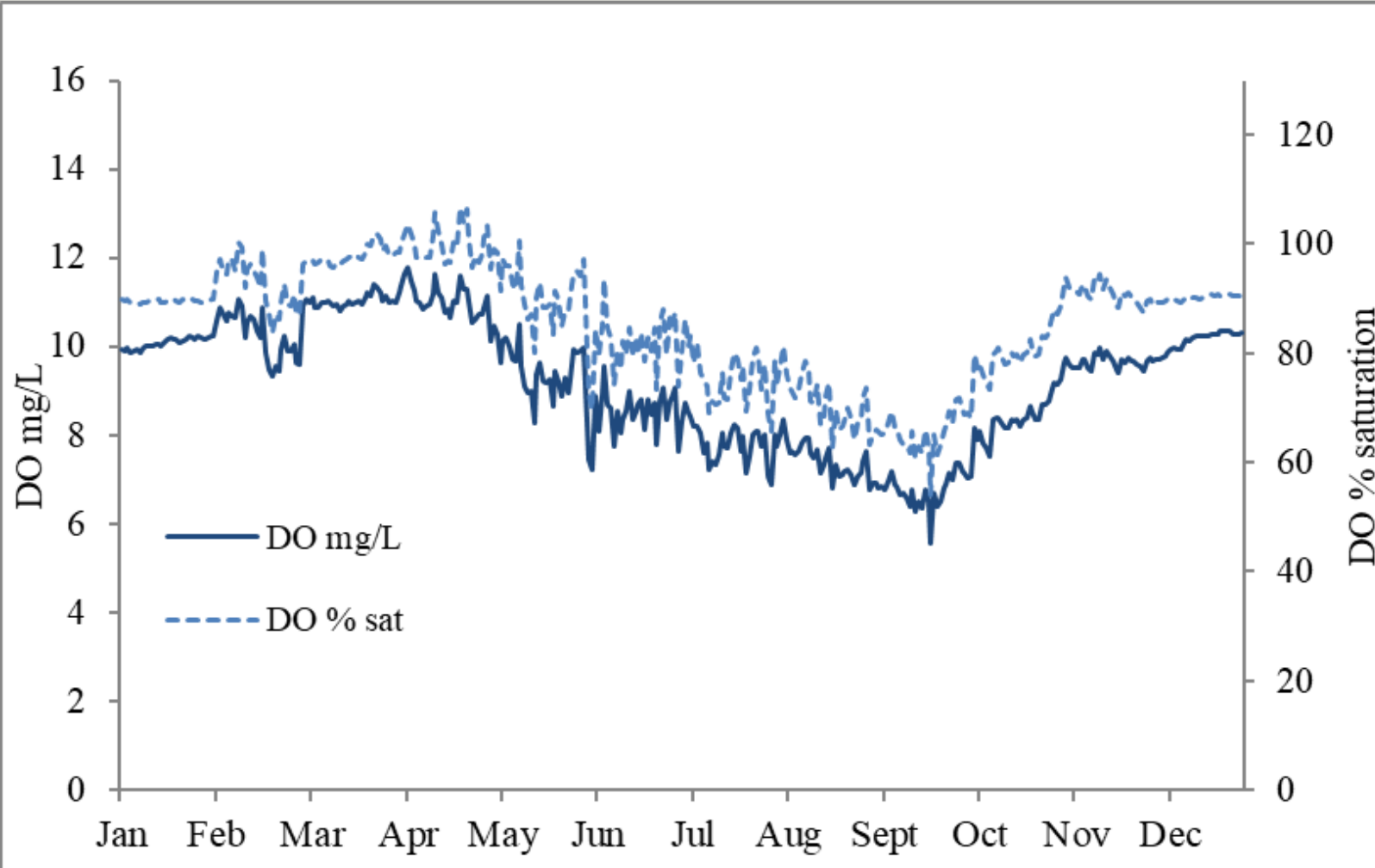
# Metolius Arm DO mg\L 2023



# RBFB DO mg\L 2023

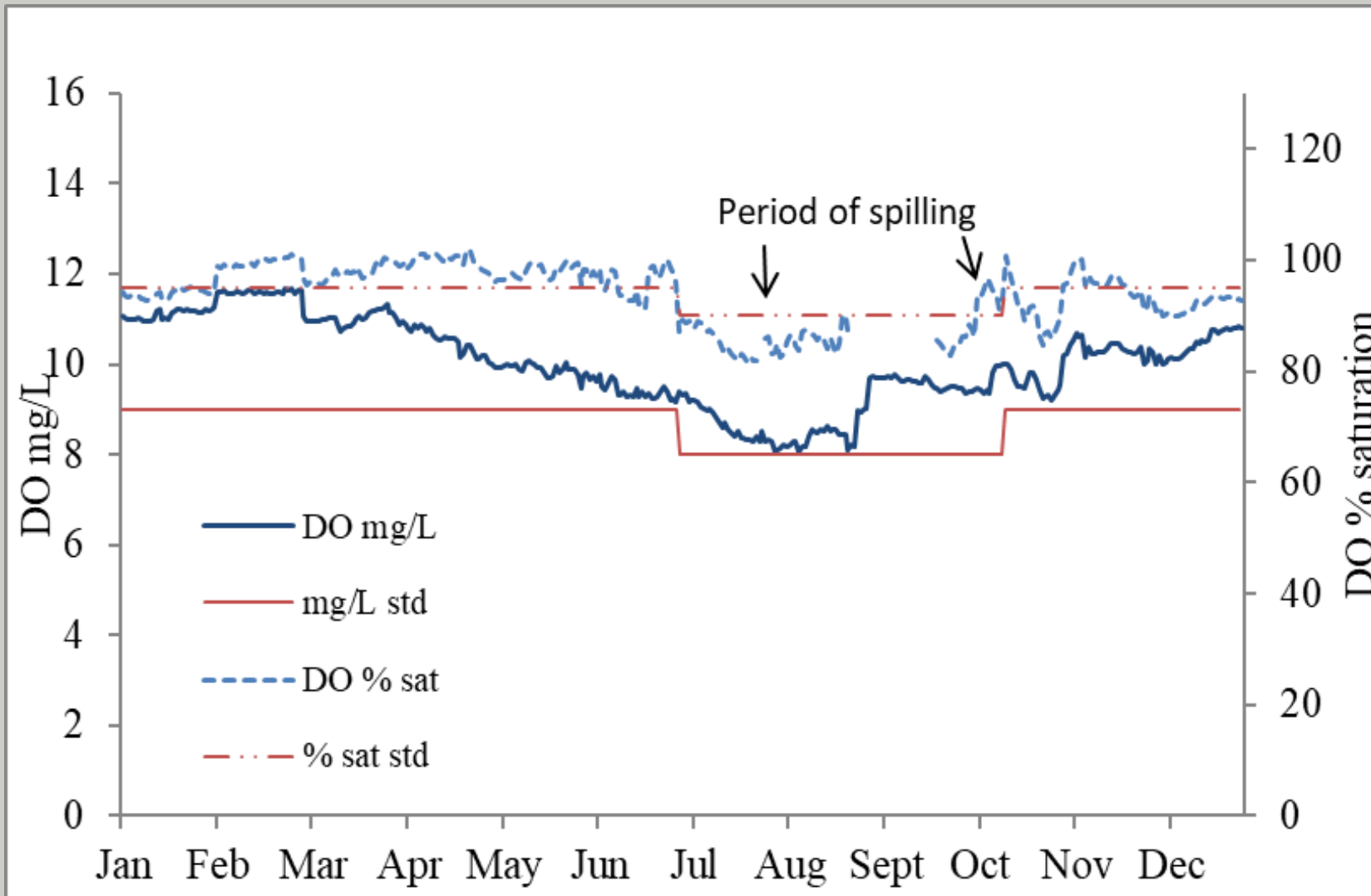


# Dissolved oxygen (daily minimum as mg/L and % saturation) at Round Butte Dam tailrace





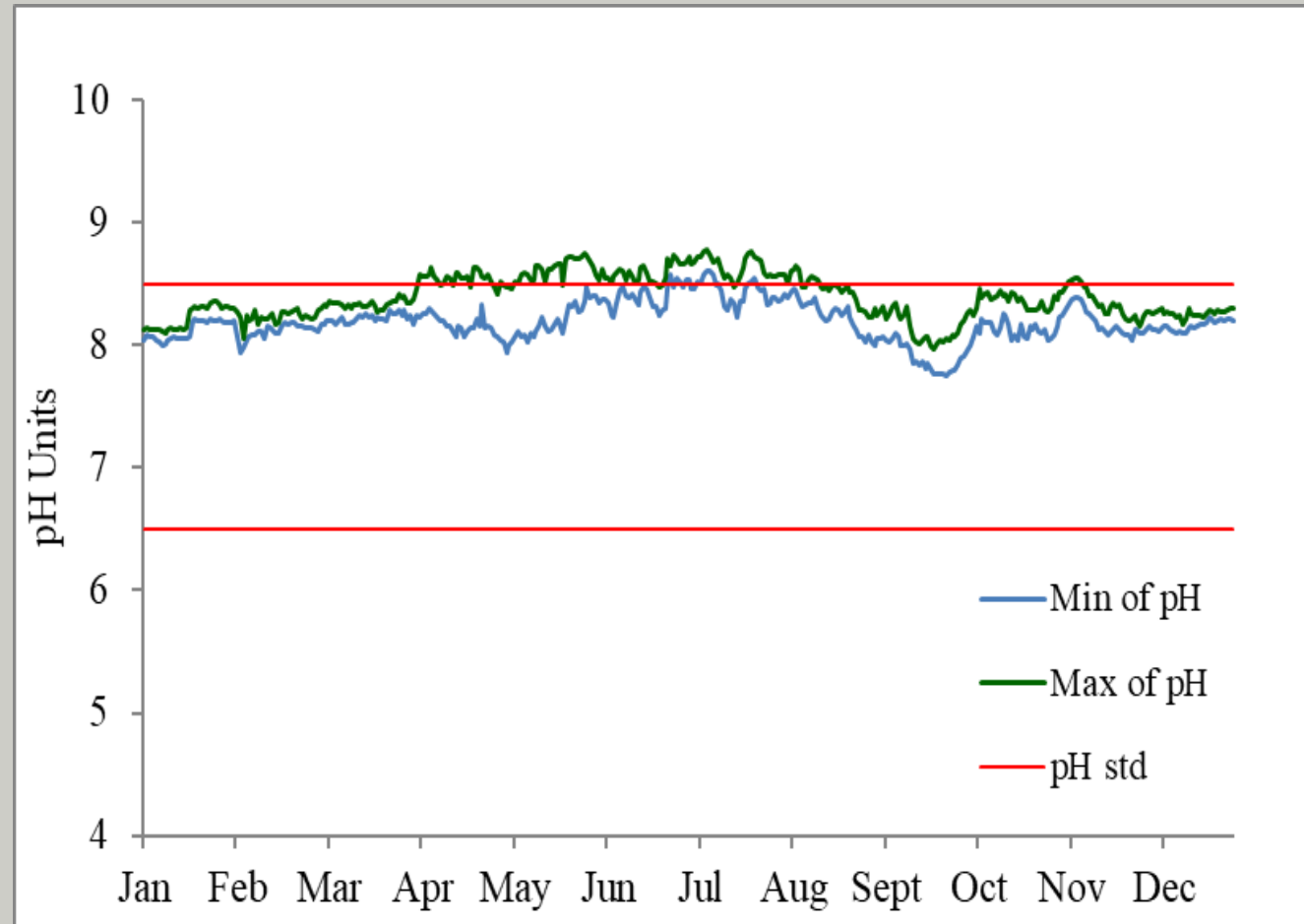
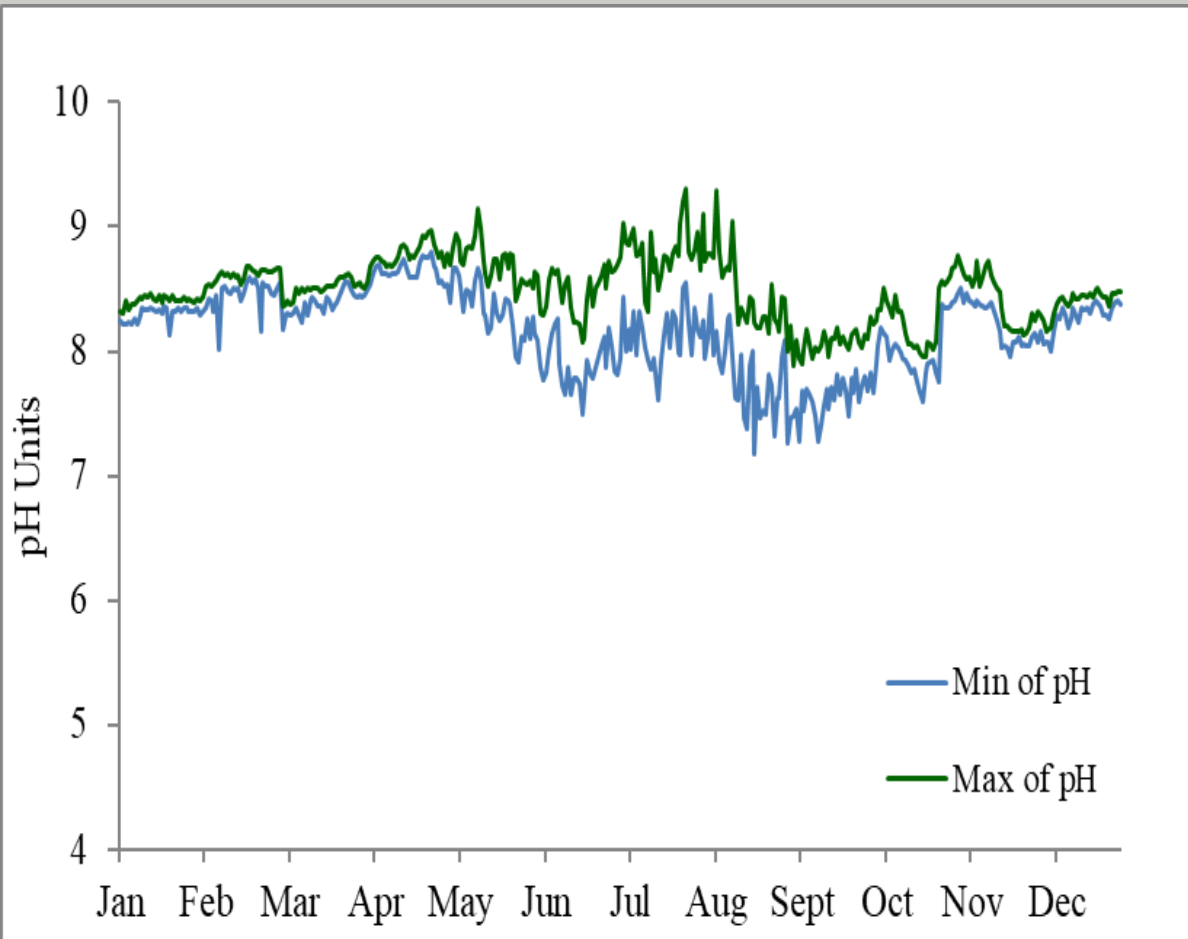
# Dissolved oxygen (daily minimum as mg/L and % saturation) at Reregulating Dam tailrace



- In 2023, spills were needed between August 4 - October 18 to boost discharge dissolved oxygen



# Values of pH (daily maximum and minimum) at Round Butte Dam tailrace and Reregulating Dam tailrace

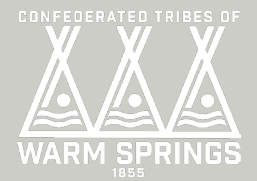


# For more information:

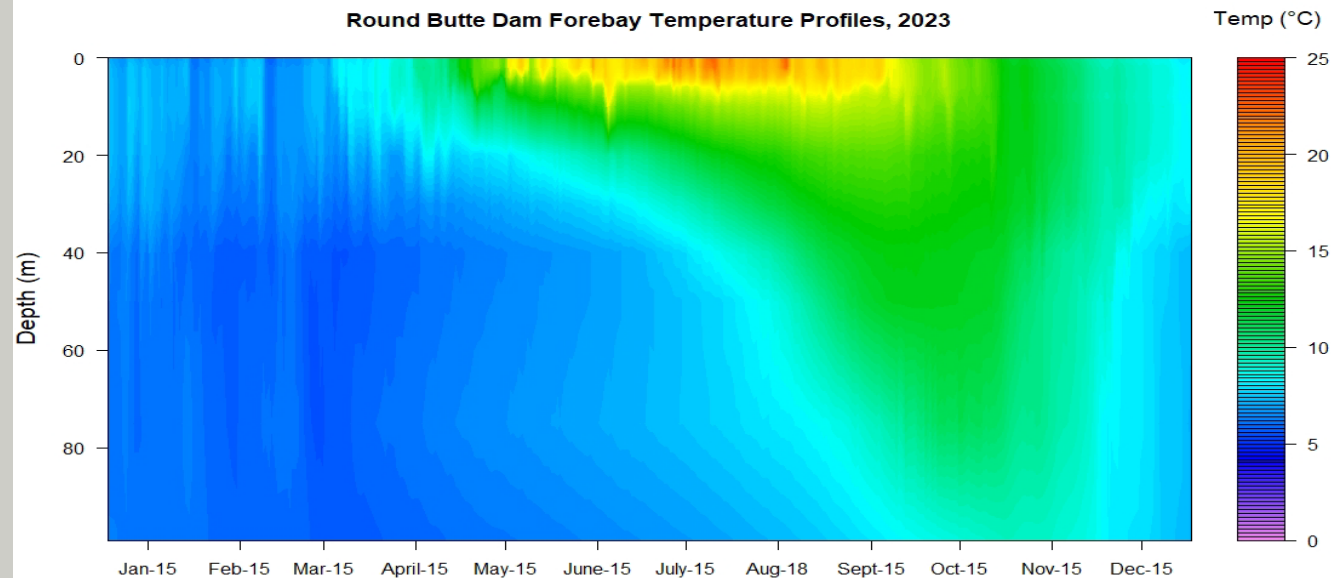
VIEW FULL REPORTS:

[2023 Water Quality Annual Report](#)

- Email me: [lori.campbell@pgn.com](mailto:lori.campbell@pgn.com)
- [Subscribe to our newsletter](#)

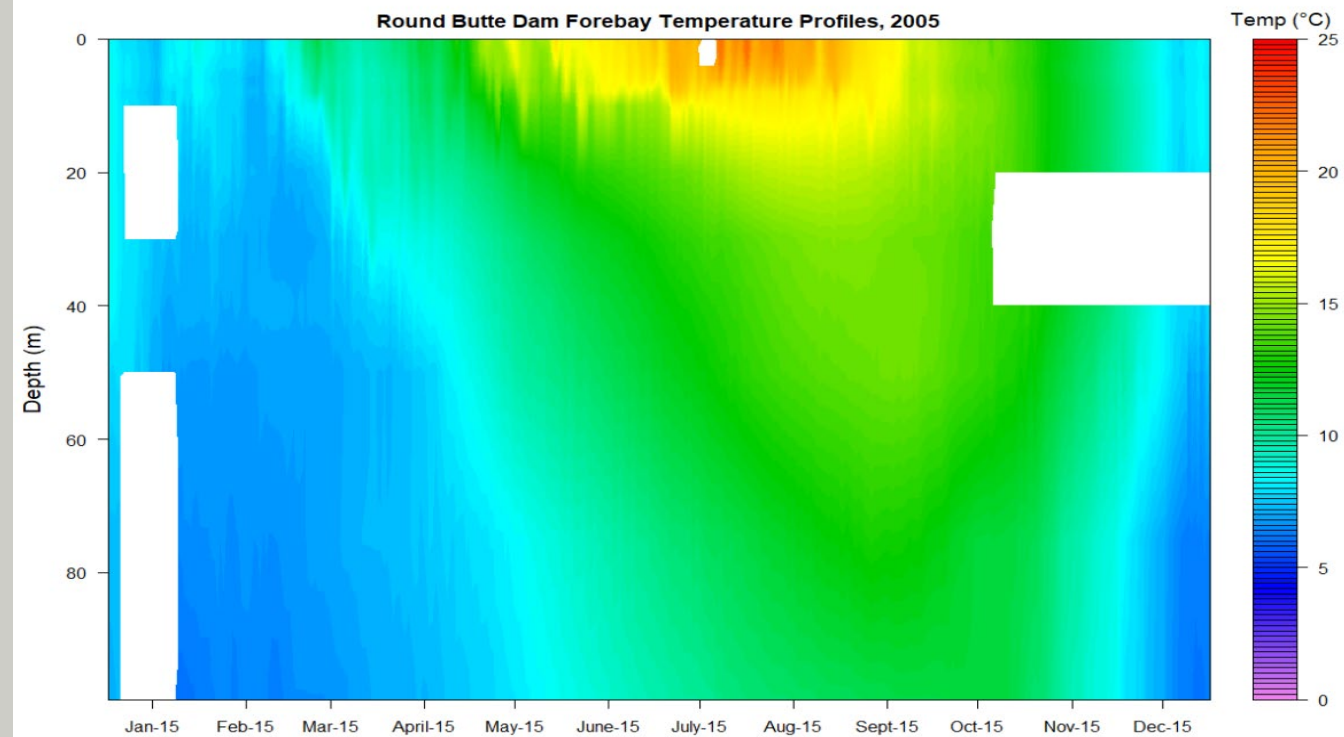


Round Butte Dam Forebay Temperature Profiles, 2023



# Round Butte Dam Forebay temperatures 2023

Round Butte Dam Forebay Temperature Profiles, 2005



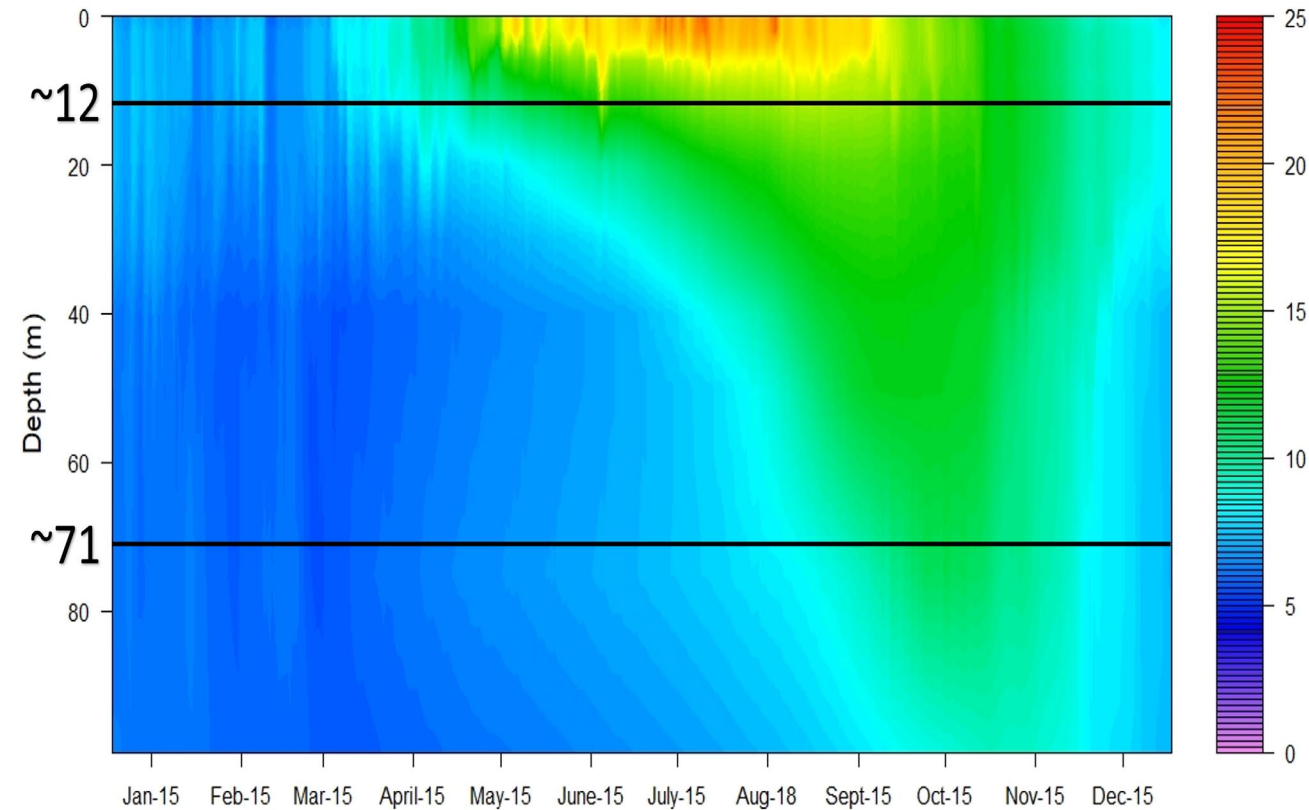
# Pre-SWW (2005)



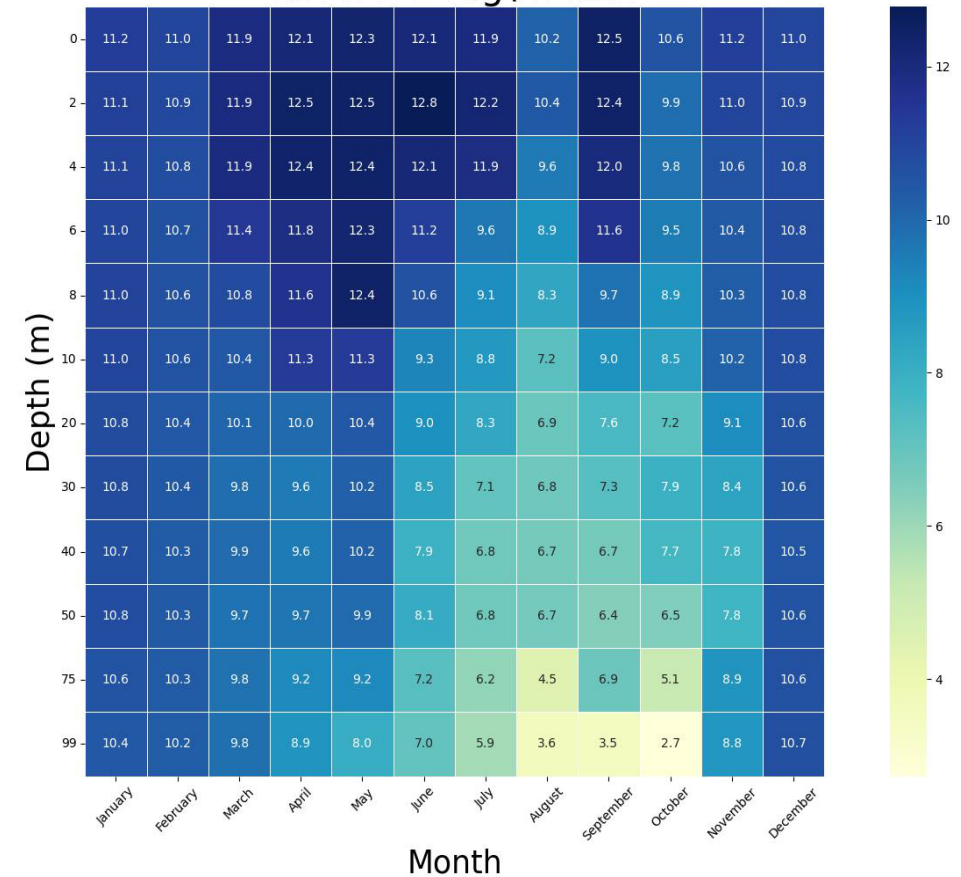
# 2023 Round Butte Dam Forebay

Round Butte Dam Forebay Temperature Profiles, 2023

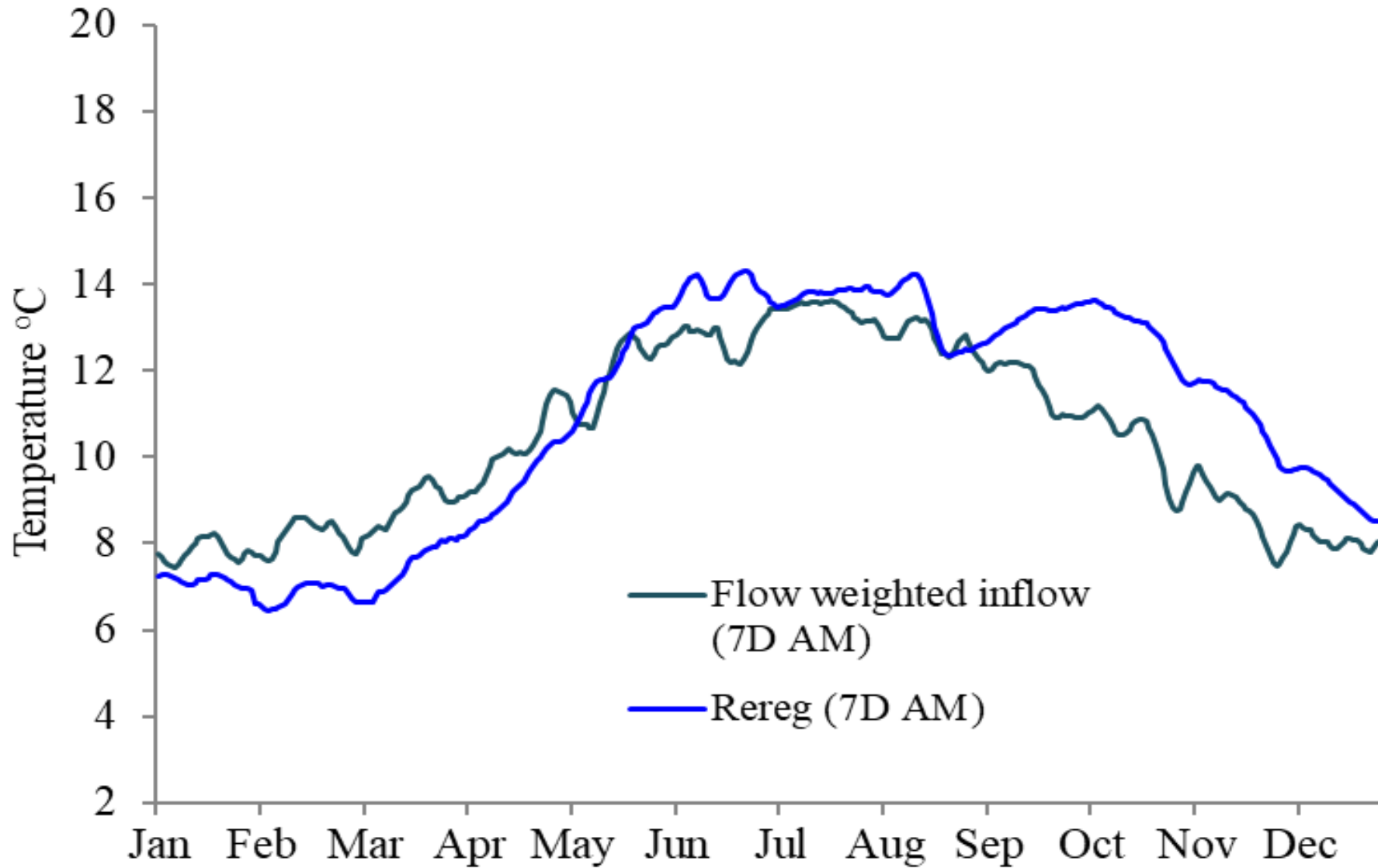
Temp (°C)



RBFB DO mg/L 2023



# 2023 Flow weighted inflow and discharge temperatures



# 2023 Discharge Temperatures

Deschutes River at RM 100.1 (Madras Gauge, USGS No. 14092500)

