SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Mar 15, 2026: Conditional Position Analysis (CPA) Implementation – LOSOM

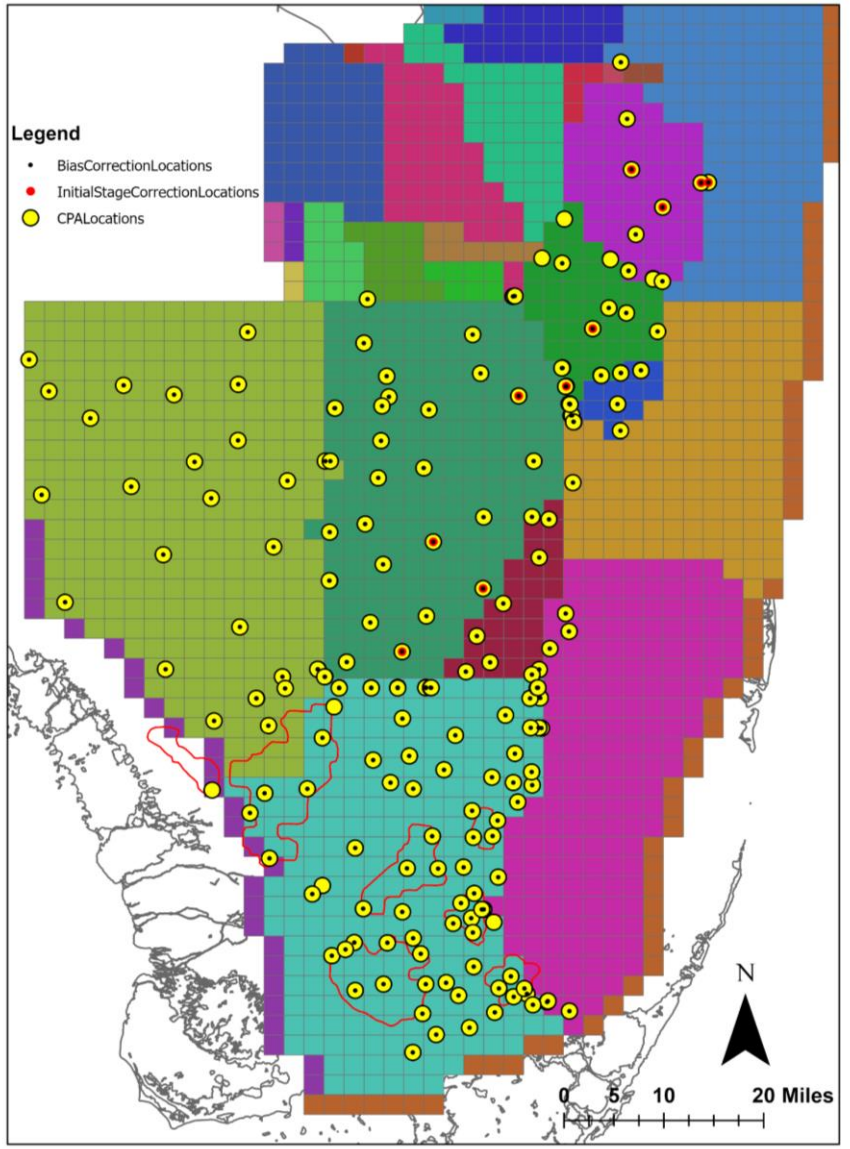
Water Resources & Systems Modeling Bureau, Systems Modeling Unit
SFWMD

sfwmd.gov

CPA Overview

- CPA is a stochastic framework (CPA Overview) that transforms stages obtained from Dynamic Position Analysis (DPA) based on forecasted rainfall conditions over the next twelve months (Ali, 2016).
- CPA depends on DPA - DPA stage outputs are used as inputs to CPA (DPA).
- 3 rainfall outlook scenarios (climatological, CPC, and Preferred Scenario) are used to compare potential stage outlooks.
- CPA is implemented for 200 locations in the Everglades including Lake Okeechobee. Additionally, CPA was implemented for WCA1Avg (avg of Site 7, Site 8T, and Site 9) and WCA3AAvg (avg of Site 63, Site 64, and Site 65) stages (Khare et al., 2024).

Conditional Position Analysis (CPA) Gage Locations

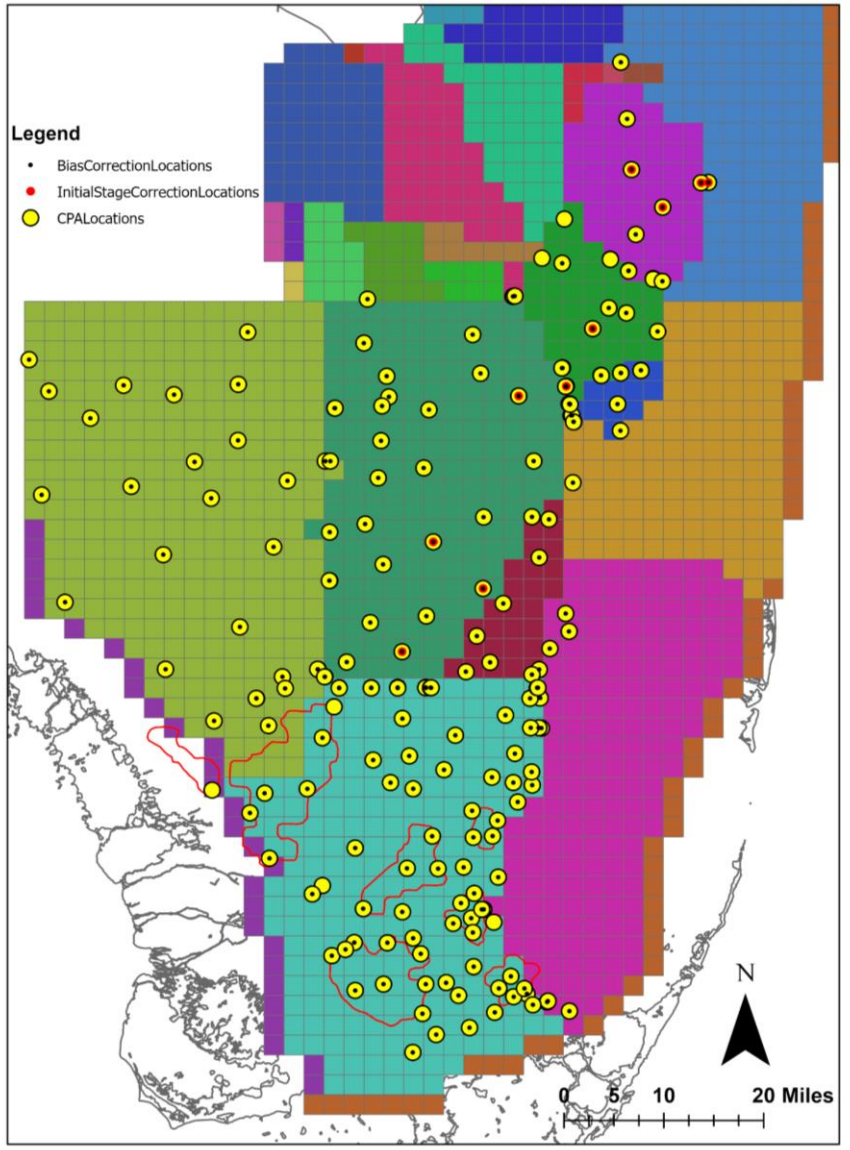


CPA Overview

CPA Outputs

- CPA forecasted stage percentiles from ‘Climatological’ scenario are first collapsed on DPA stage percentiles. Corresponding adjustments are then applied to stage percentile lines for all other rainfall scenarios.

Conditional Position Analysis (CPA) Gage Locations



CPA: Rainfall Scenarios for Mar 15, 2026

Climatological

- Climatological scenario assumes equal chances of below-normal/dry, normal, and above-normal/wet rainfall conditions over next twelve 3 monthly seasons (slide 5).
- This scenario is the connecting link between DPA and all other scenarios simulated under CPA.

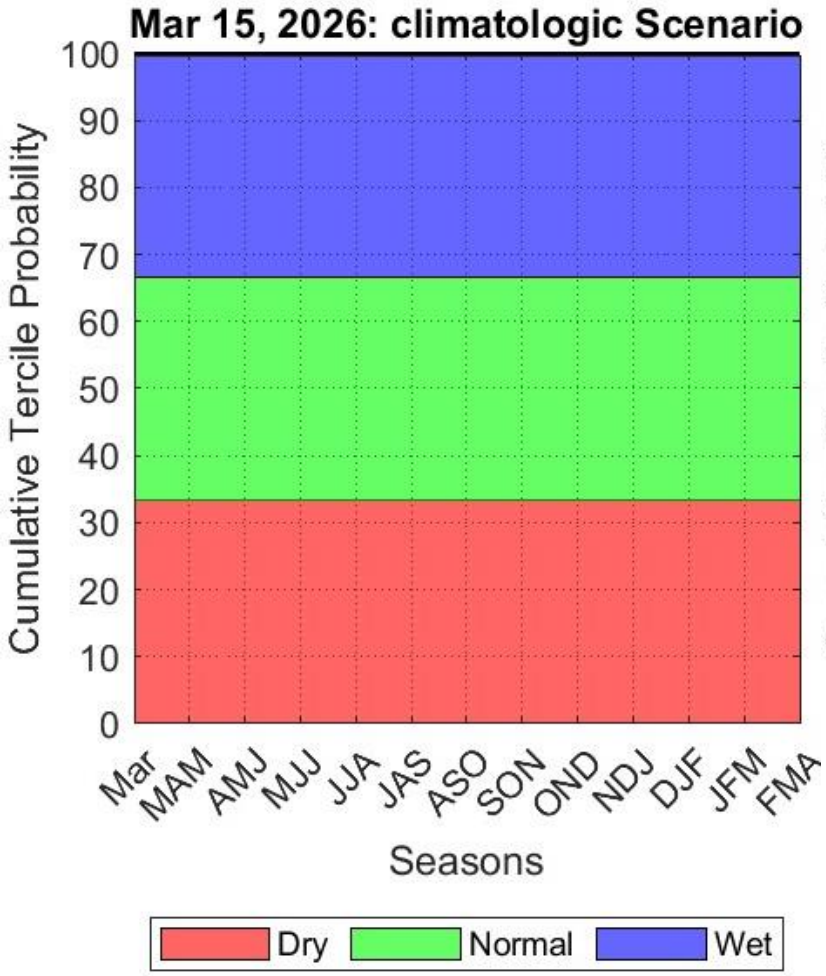
CPC

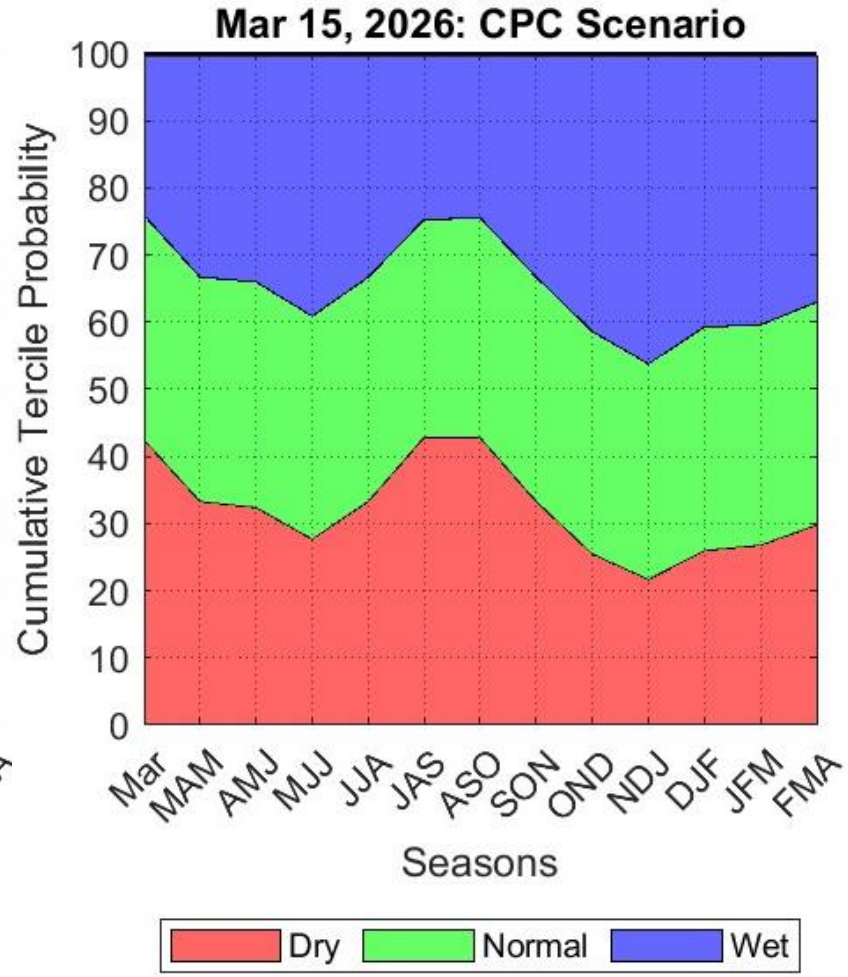
- This is based on official rainfall forecasts published by NOAA's Climate Prediction Center (CPC) every month (Climate Prediction Center - Forecasts & Outlook Maps, Graphs and tables (noaa.gov)).
- The March 15, 2026, CPC rainfall scenario reflects the latest rainfall outlook released by CPC.
- It is also used by JEM's EverForecast tool for stage prediction.

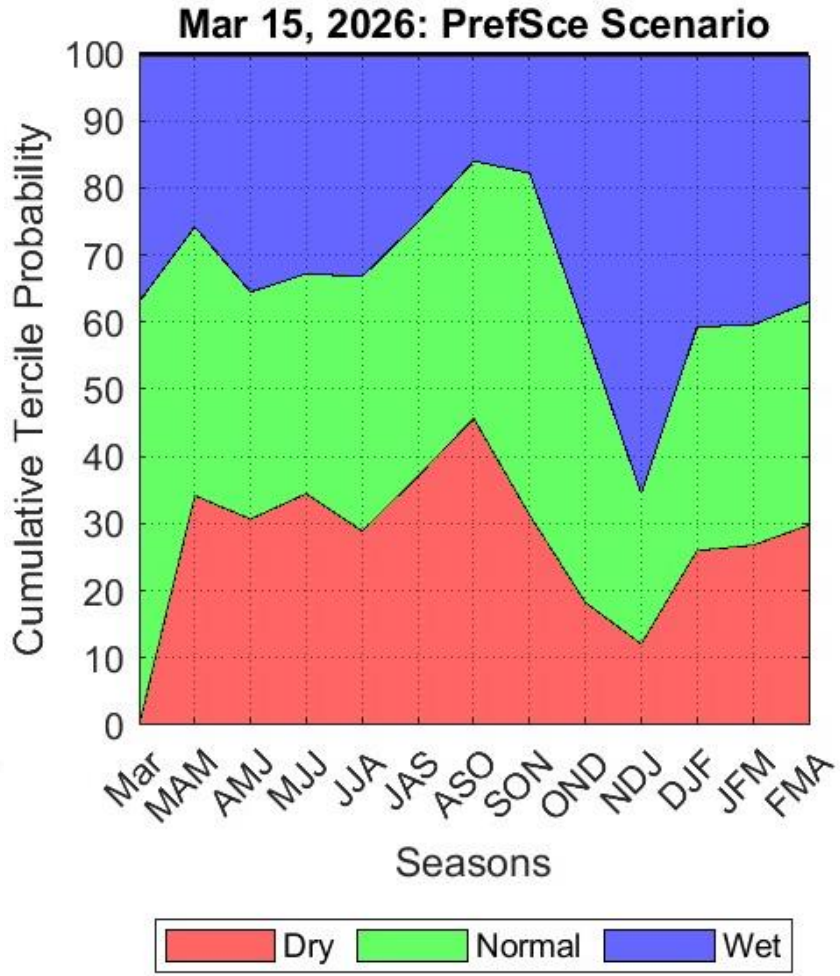
Preferred Scenario (PrefSce)

- Seasonal rainfall probabilities are calculated based on historical data and projected Niño-3.4 Index (Climate Prediction Center - El Nino Southern Oscillation (noaa.gov)) published by CPC.
- This scenario developed by System Modeling Unit (**PrefSce Overview**) represents a best professional judgement rainfall outlook.
- March 15, 2026, PrefSce rainfall scenario includes latest release of seasonal rainfall outlook from NOAA and IRI.
- Seasonal tercile probabilities of the remaining days of the current MAM season are estimated from QPF produced by WMD, WPC, ECMWF HRES, and 100 ECMWF ensembles, in combination with historical rainfall data during 1991–2020.
- The monthly probability for the remaining days of March is derived from the QPF estimates generated using the same method described above.

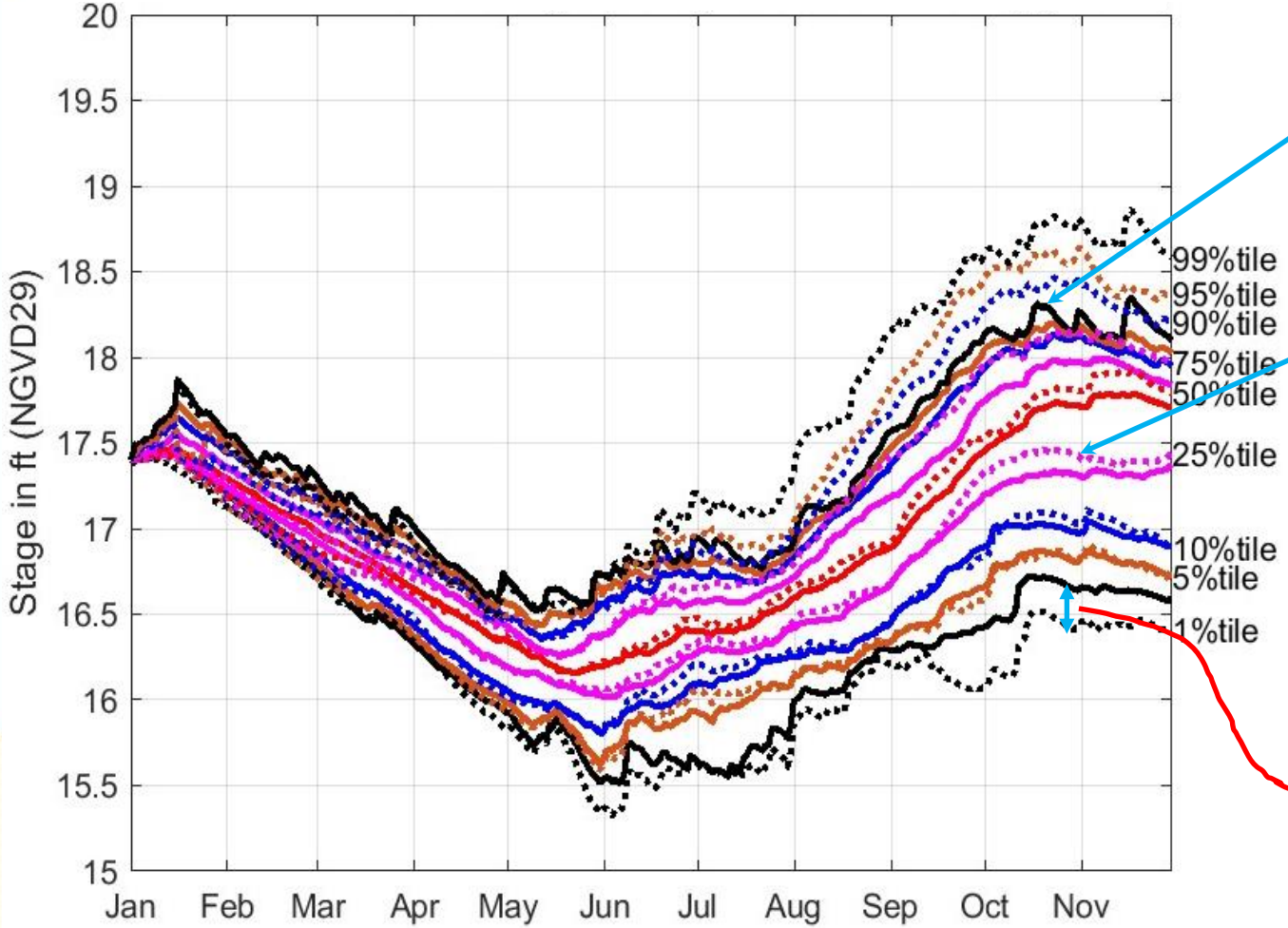
March 15, 2026 CPA: Rainfall Scenarios







CPA: Key to Reading Results



Solid lines → Climatological Scenario/DPA

Dotted lines → Alternative Rainfall Scenario

Black lines → 1% and 99%
Brown lines → 5% and 95%
Blue lines → 10% and 90%
Pink lines → 25% and 75%
Red lines → 50%

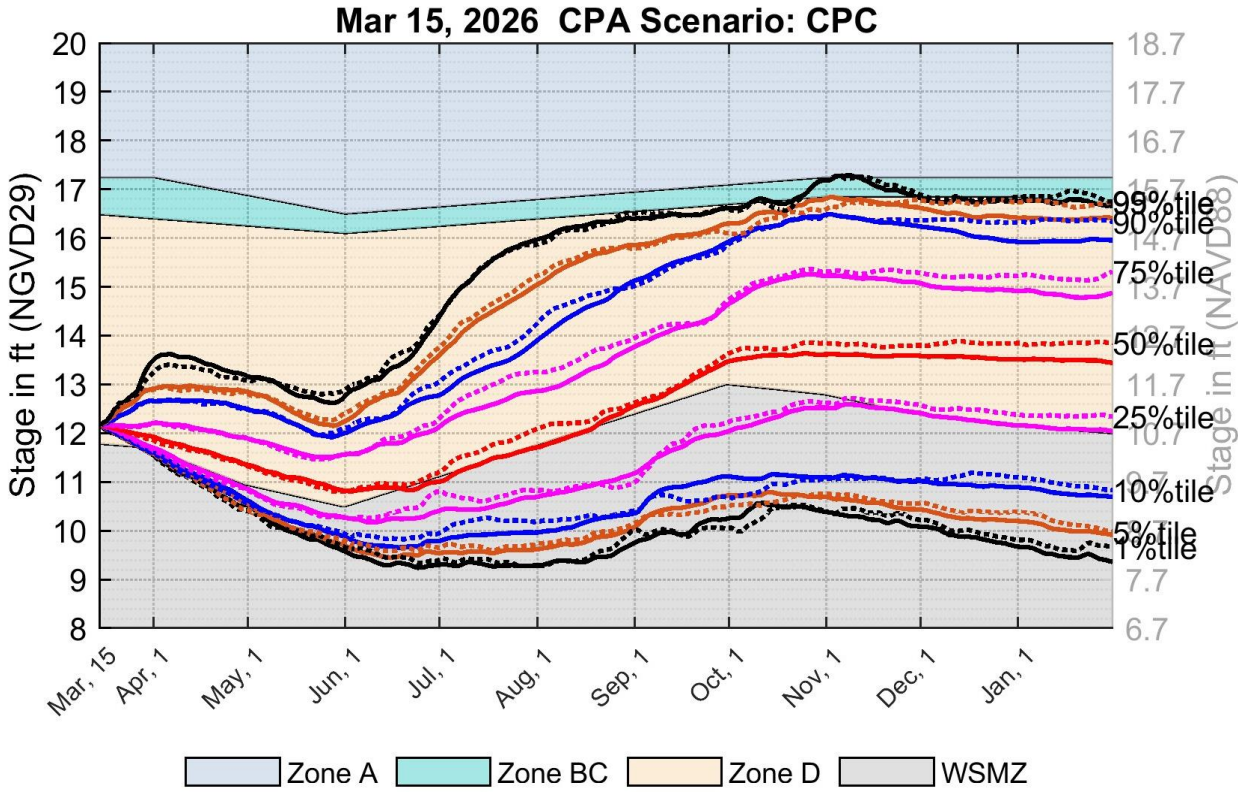
Need to focus on how DPA percentile lines shift under Alternate Rainfall Scenario

LOSOM

March 15, 2026 CPA: LOK

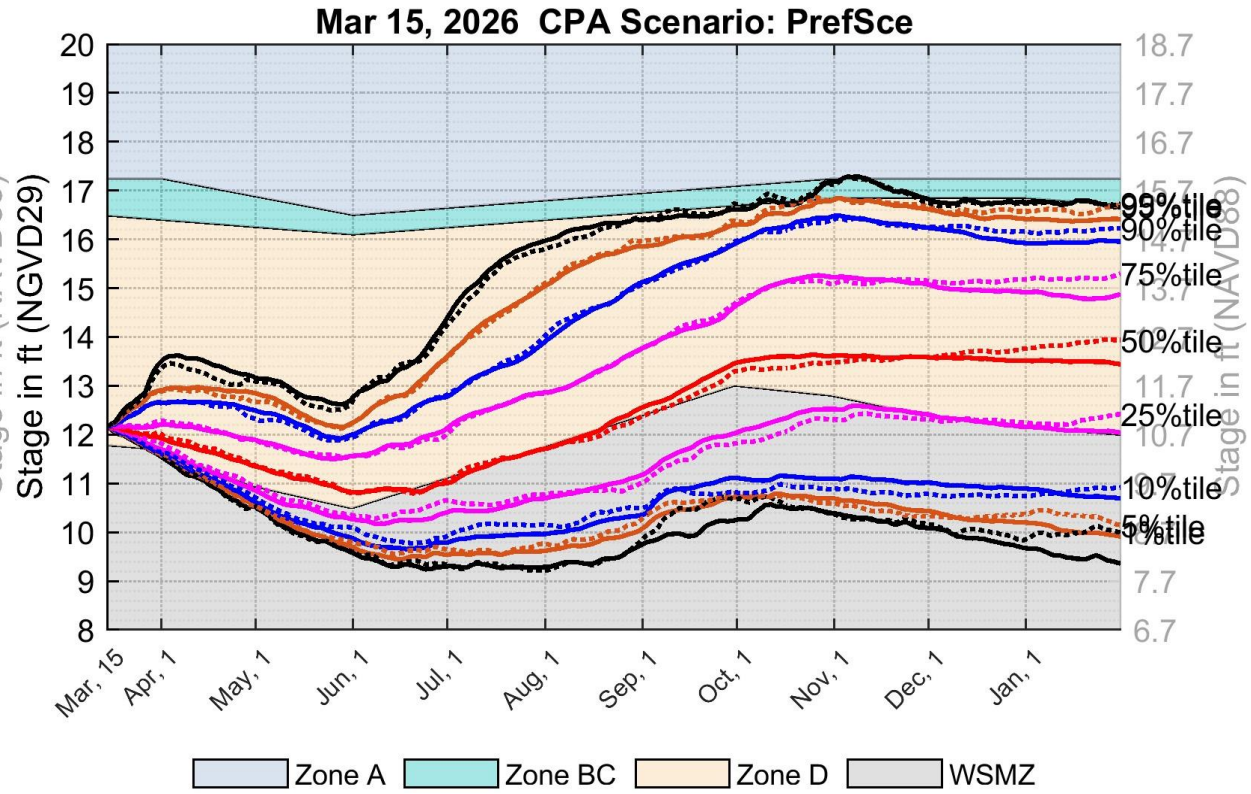
CPC

LOK



PrefSce

LOK

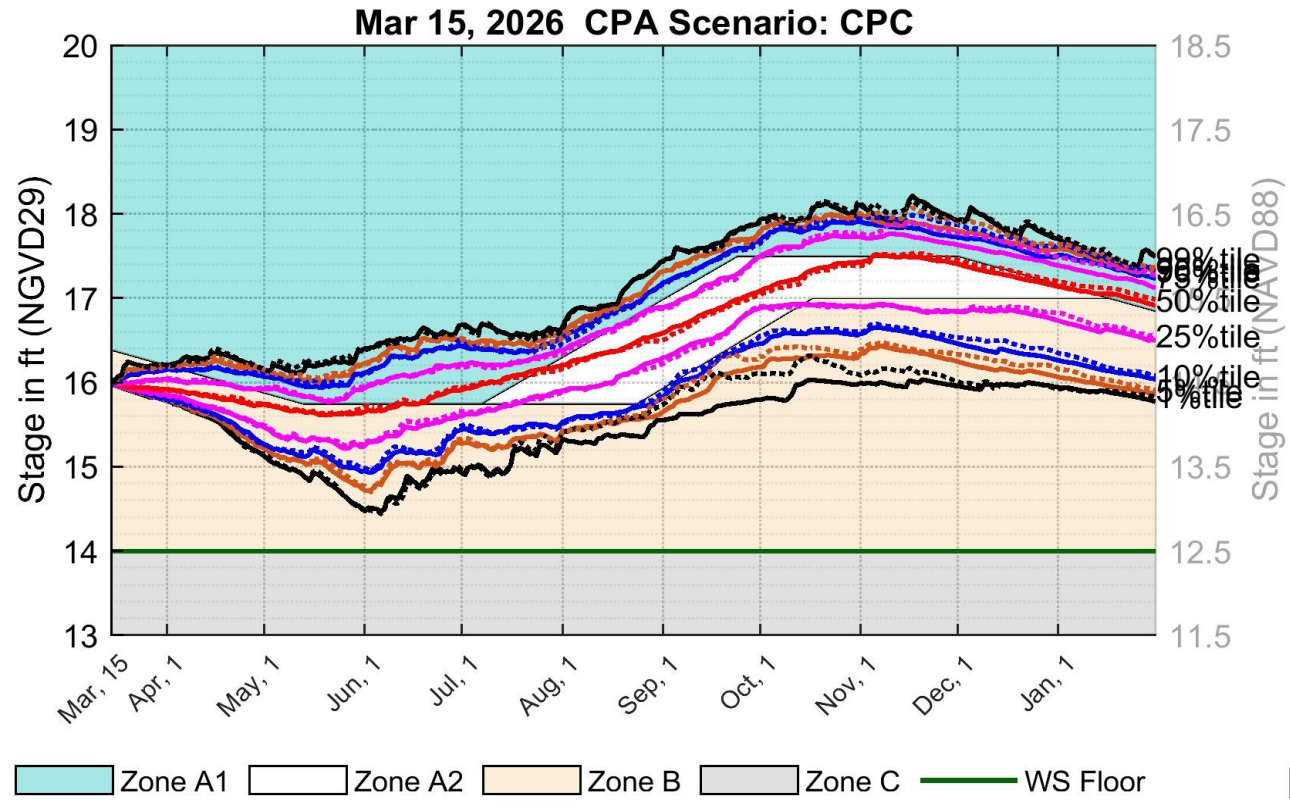


Secondary vertical axis shows stages in NAVD88. These stages are based on Agreed Upon Regulation Schedule Conversion Offsets between NGVD29 and NAVD88 (1.30 ft for Lake Okeechobee).

March 15, 2026 CPA: WCA1 3-Gage Avg.

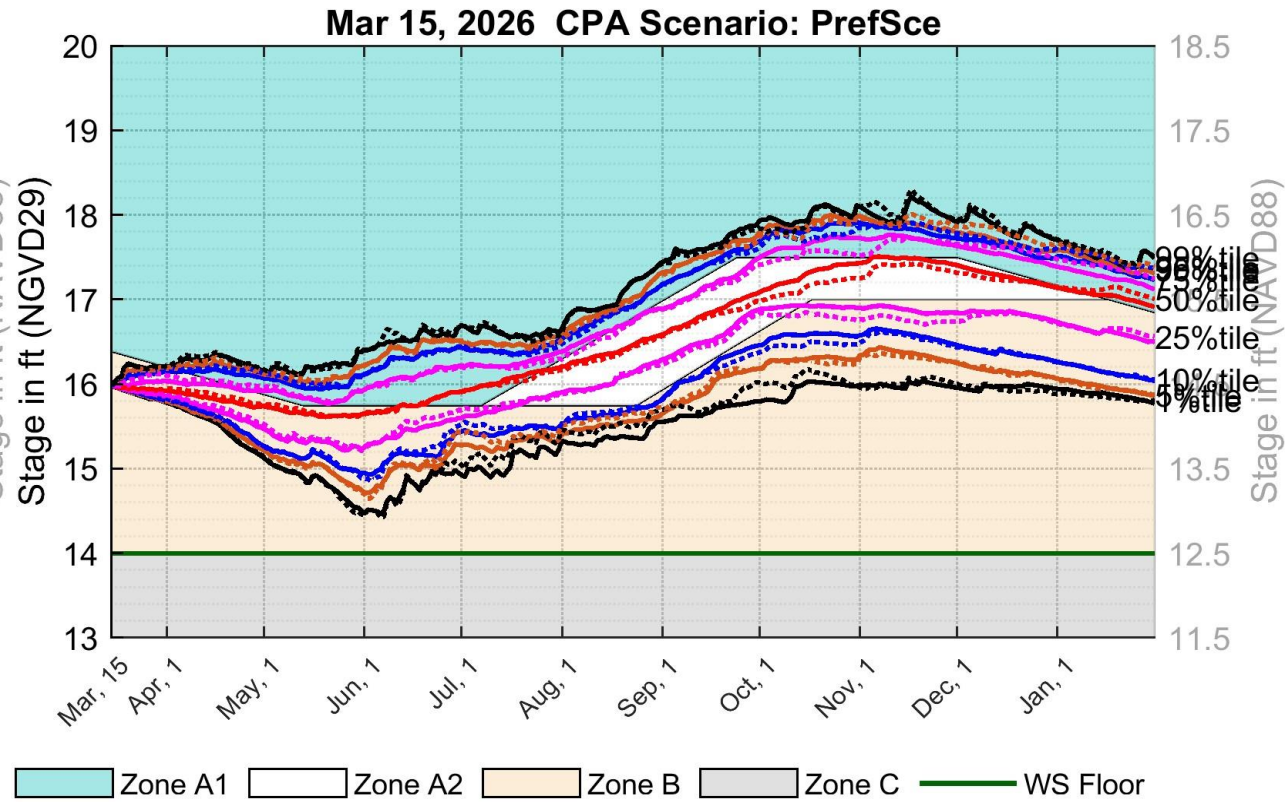
CPC

WCA1 3-Gage Avg



PrefSce

WCA1 3-Gage Avg

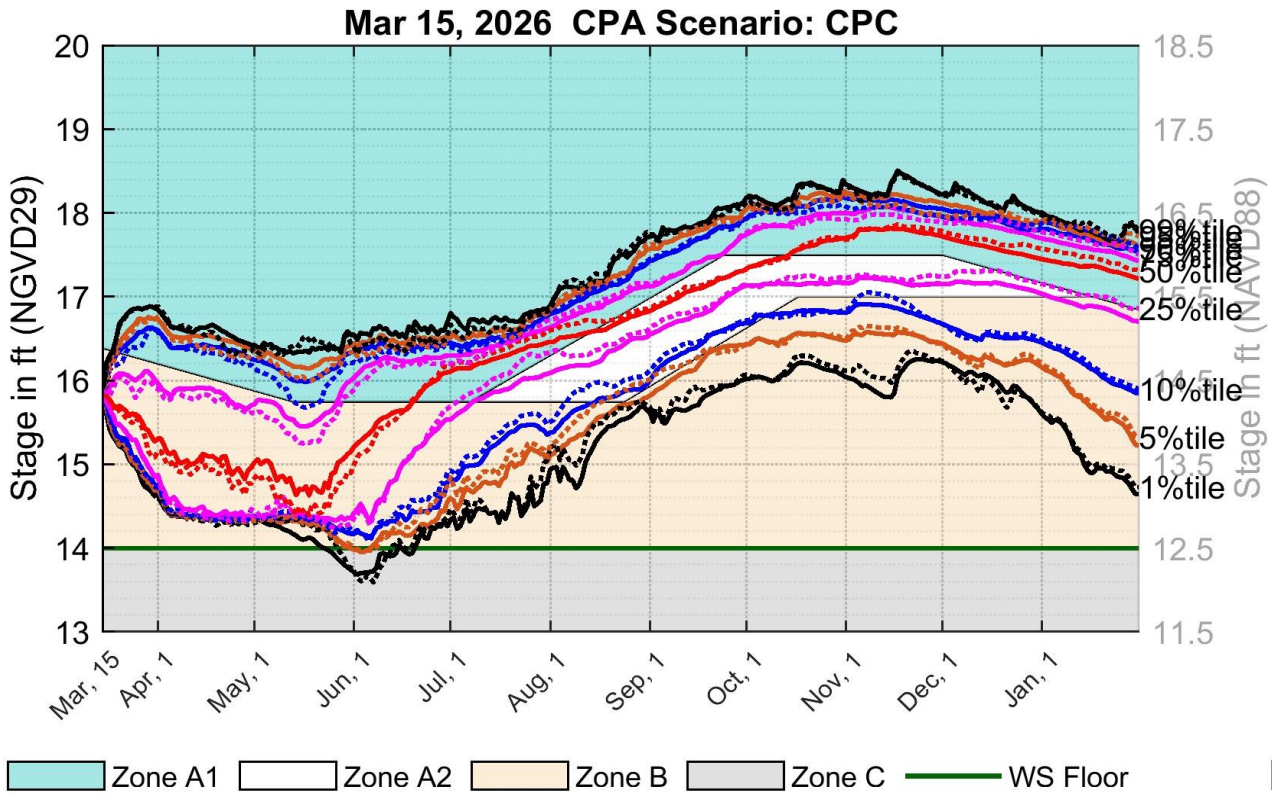


Secondary vertical axis shows stages in NAVD88. These stages are based on Agreed Upon Regulation Schedule Conversion Offsets between NGVD29 and NAVD88 (1.5 ft for WCA1).

March 15, 2026 CPA: WCA1 Site 8-C

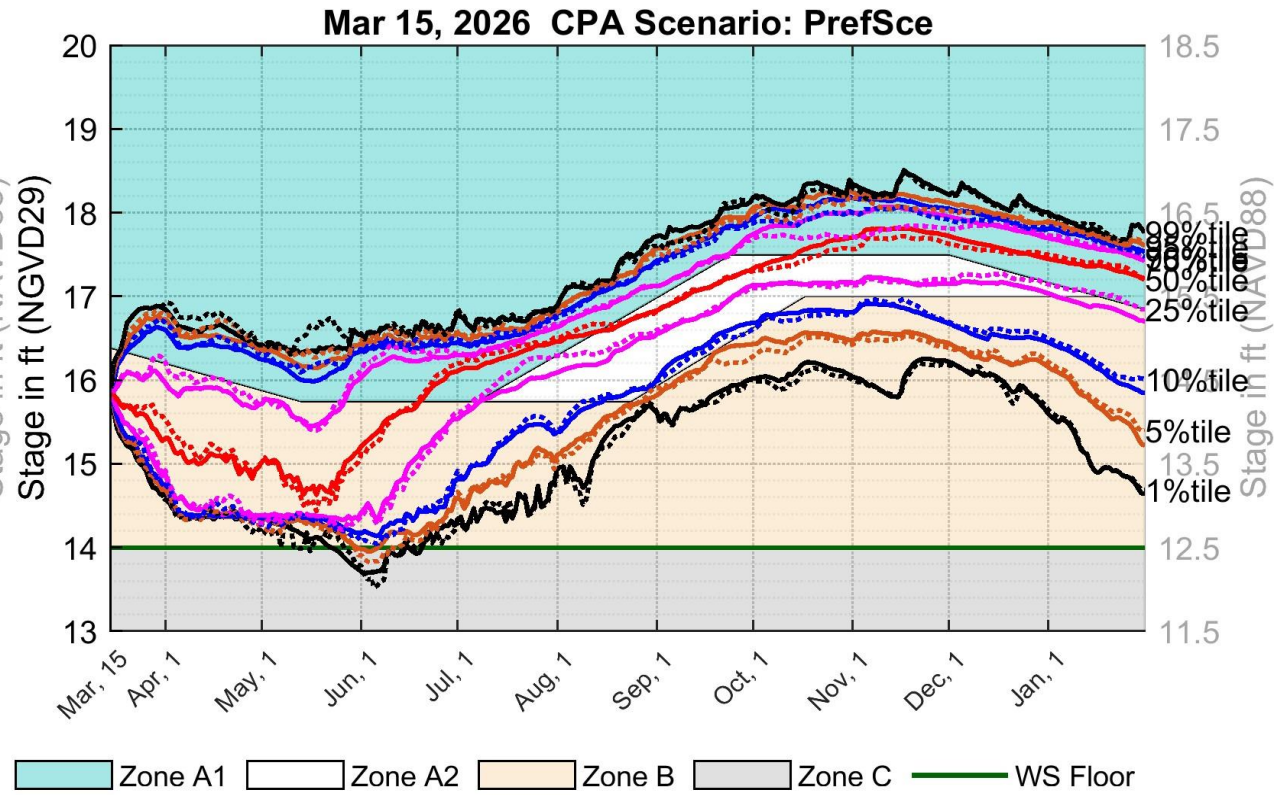
CPC

WCA1 Site 8-C



PrefSce

WCA1 Site 8-C

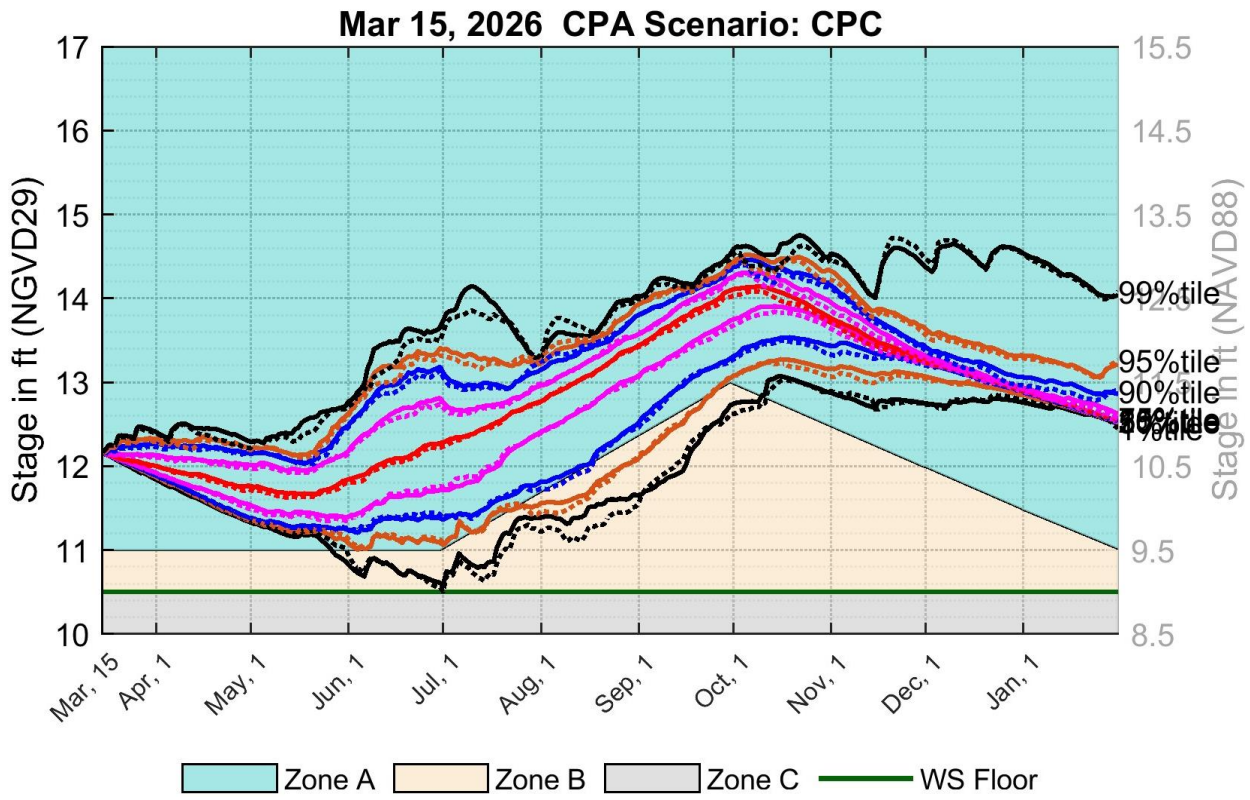


Secondary vertical axis shows stages in NAVD88. These stages are based on Agreed Upon Regulation Schedule Conversion Offsets between NGVD29 and NAVD88 (1.5 ft for WCA1).

March 15, 2026 CPA: WCA2A Site-17

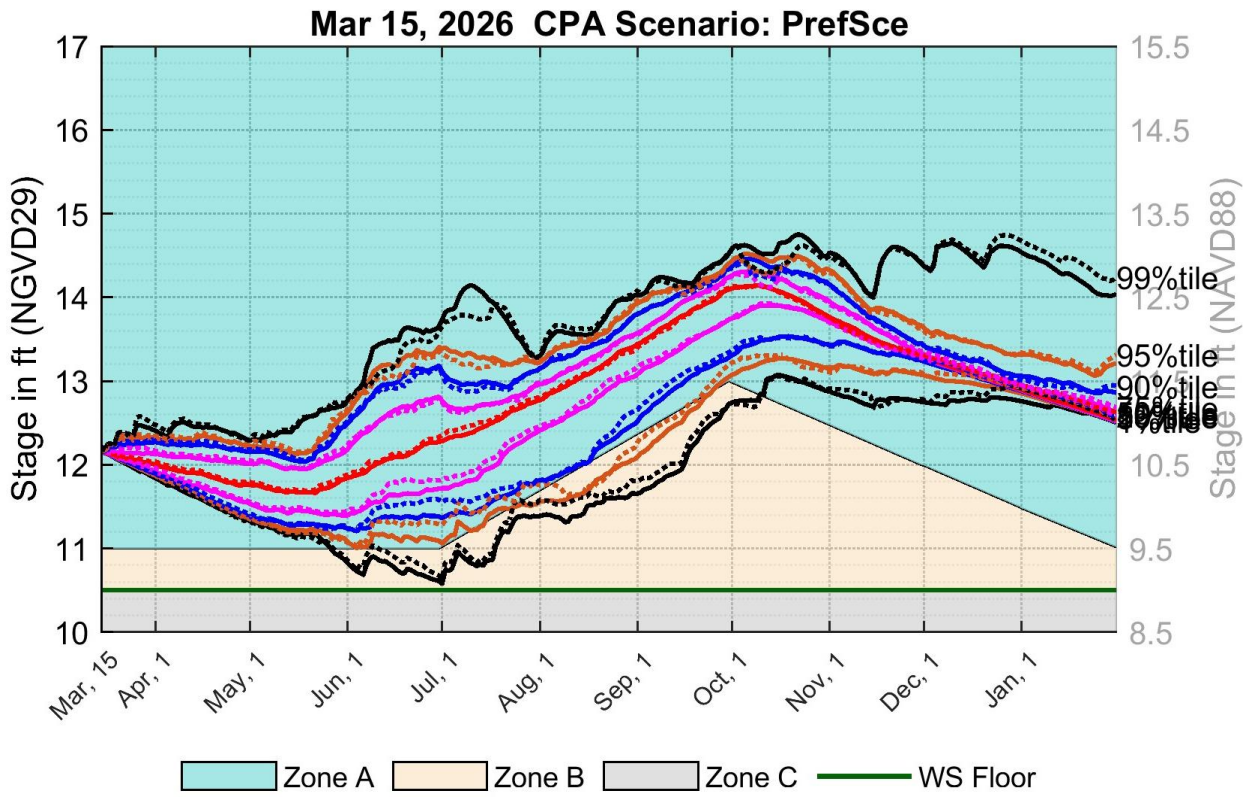
CPC

WCA2A Site-17



PrefSce

WCA2A Site-17

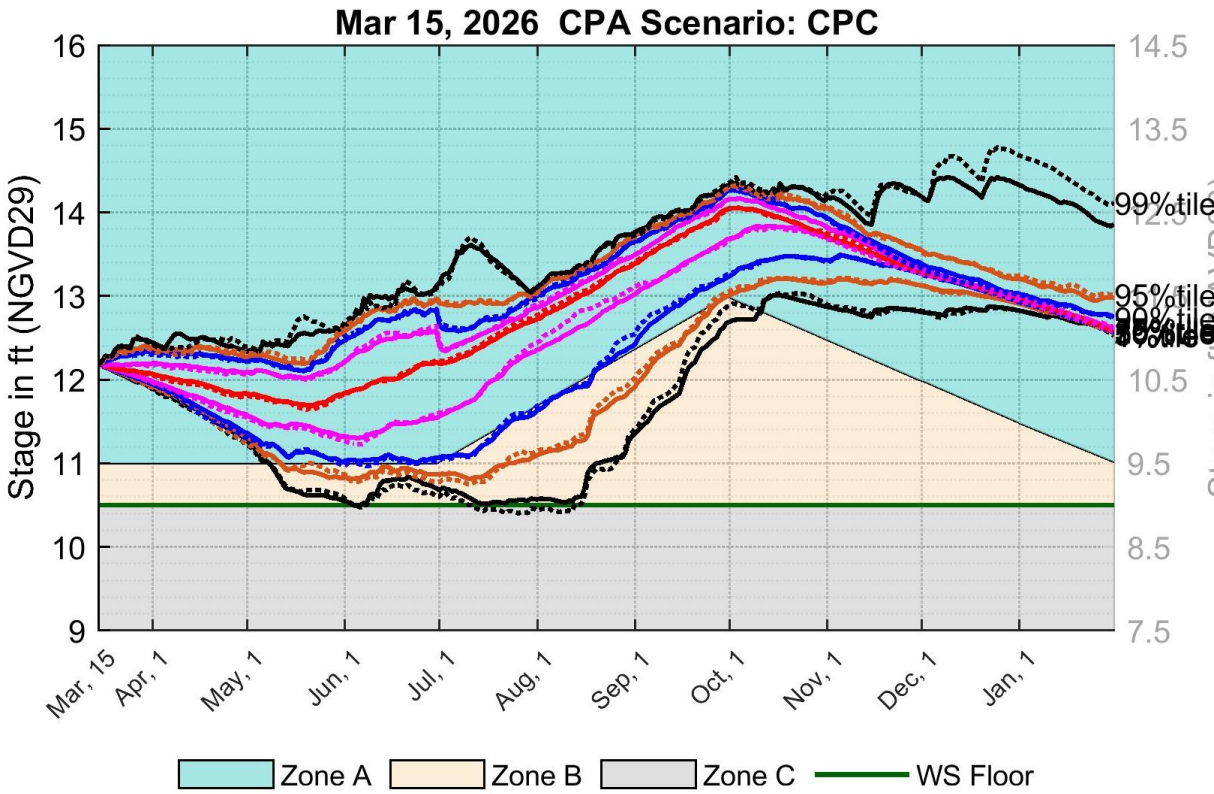


Secondary vertical axis shows stages in NAVD88. These stages are based on Agreed Upon Regulation Schedule Conversion Offsets between NGVD29 and NAVD88 (1.5 ft for WCA2A).

March 15, 2026 CPA: WCA2A S11B_H

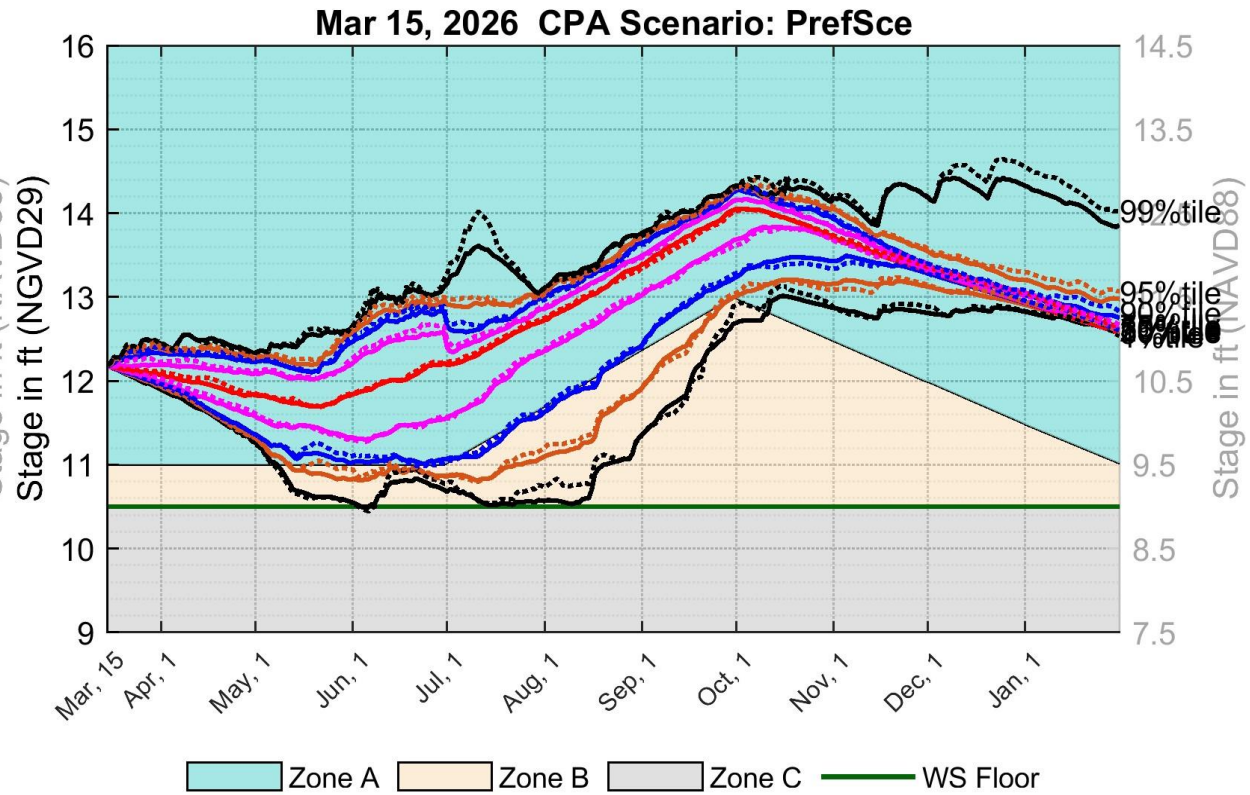
CPC

WCA2A S11B_H



PrefSce

WCA2A S11B_H

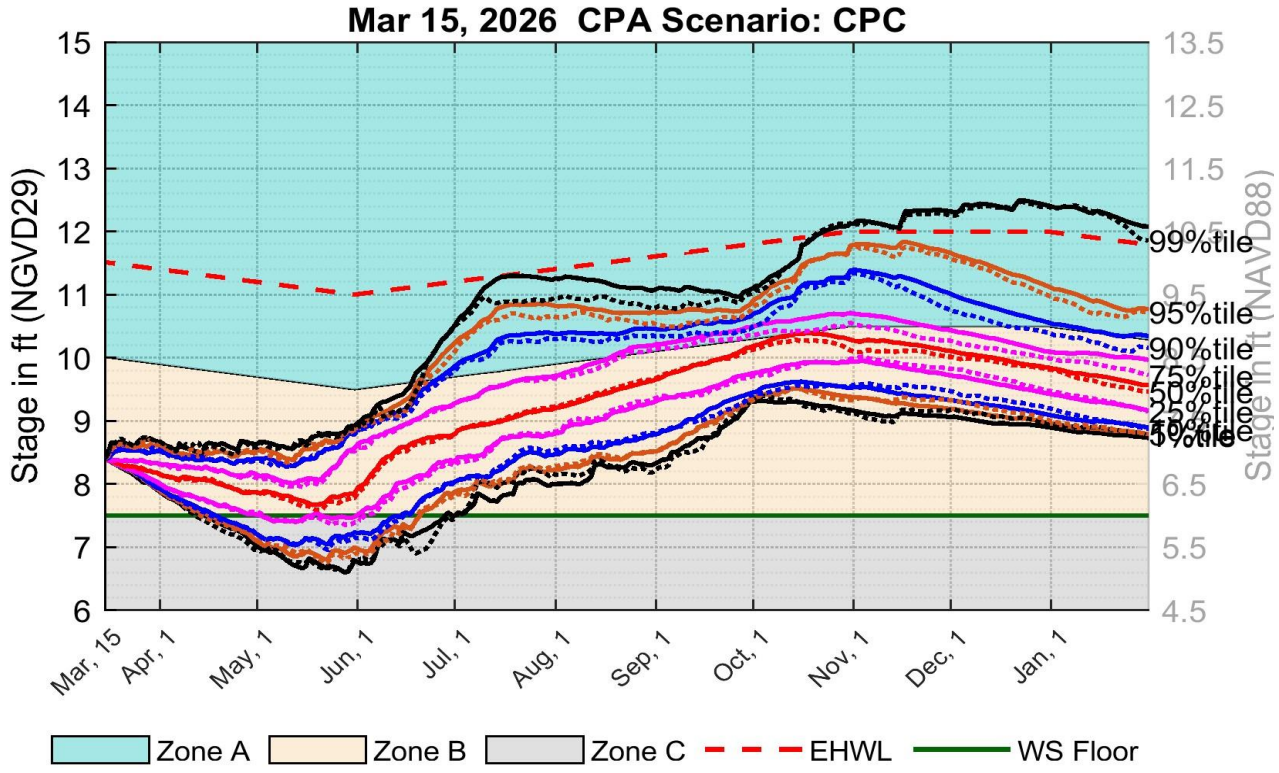


Secondary vertical axis shows stages in NAVD88. These stages are based on Agreed Upon Regulation Schedule Conversion Offsets between NGVD29 and NAVD88 (1.5 ft for WCA2A).

March 15, 2026 CPA: WCA3A 3 Gage Avg.

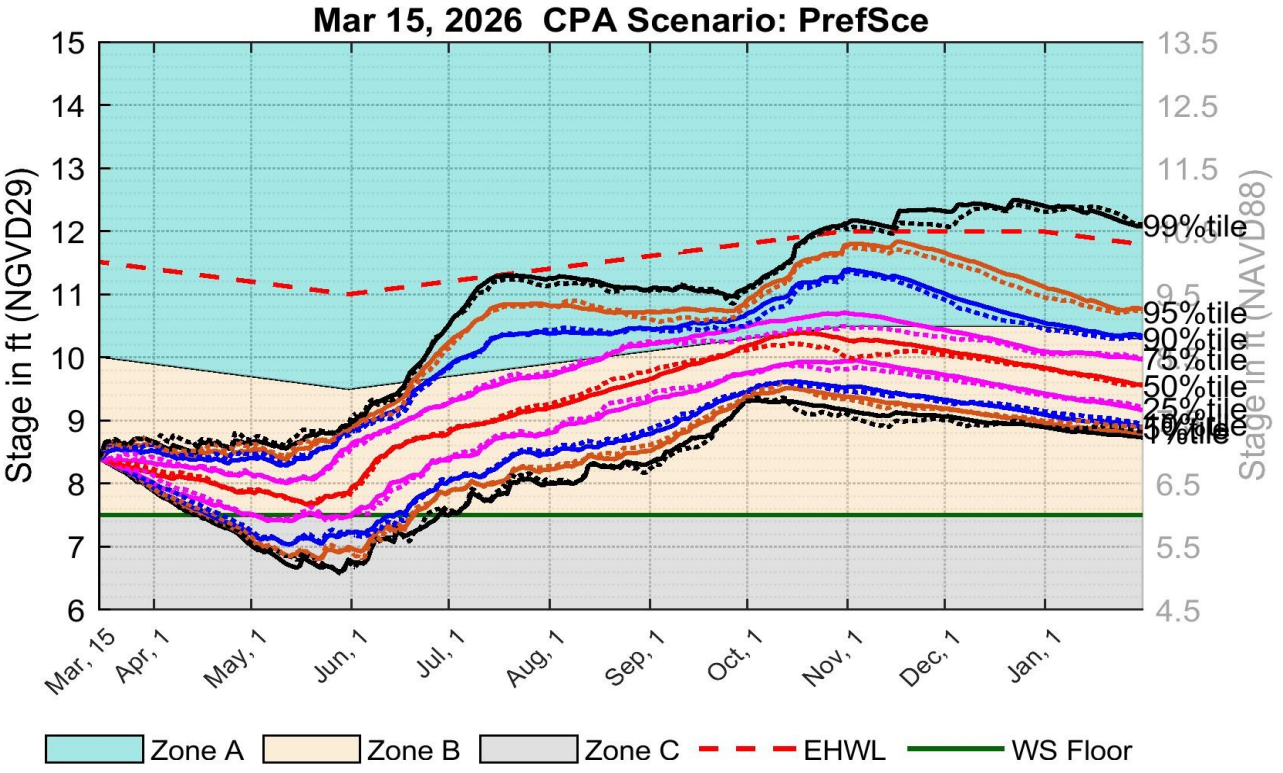
CPC

WCA3AAvg



PrefSce

WCA3AAvg

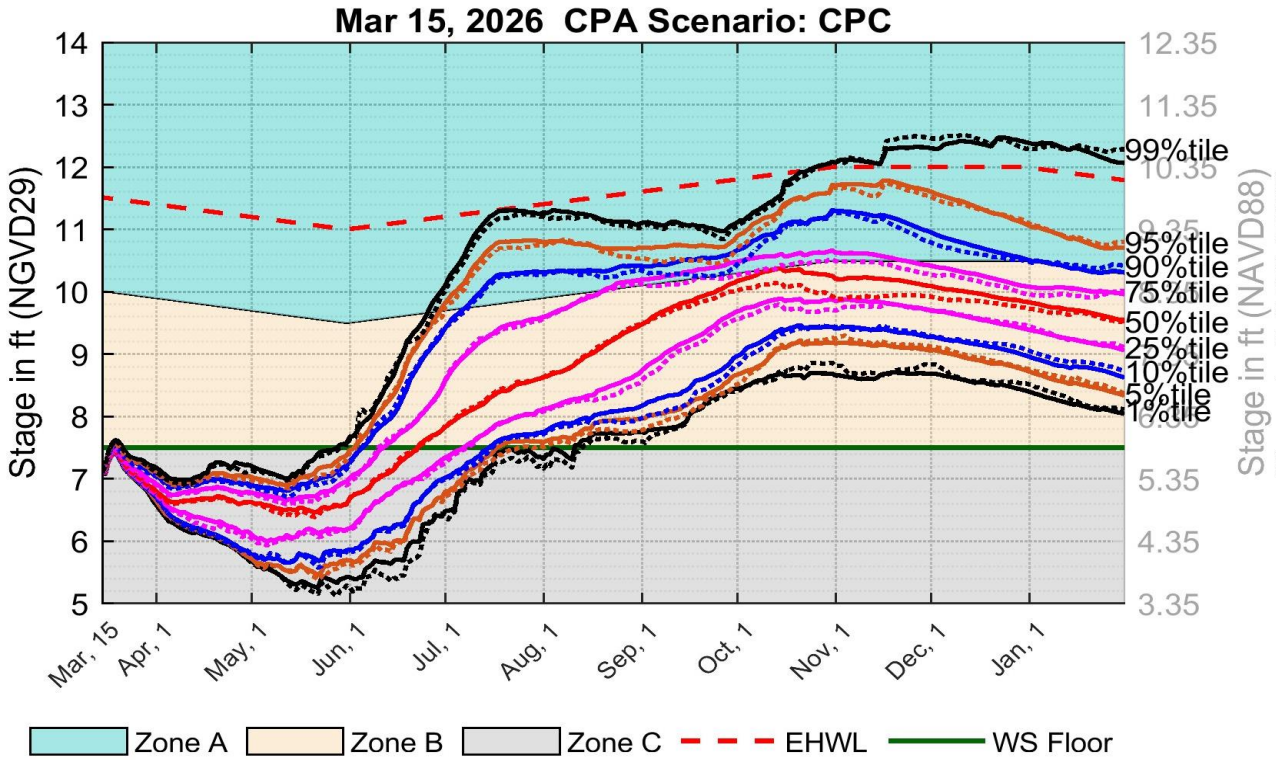


Secondary vertical axis shows stages in NAVD88. These stages are based on Agreed Upon Regulation Schedule Conversion Offsets between NGVD29 and NAVD88 (1.5 ft for WCA3A).

March 15, 2026 CPA: WCA3A Site 69W

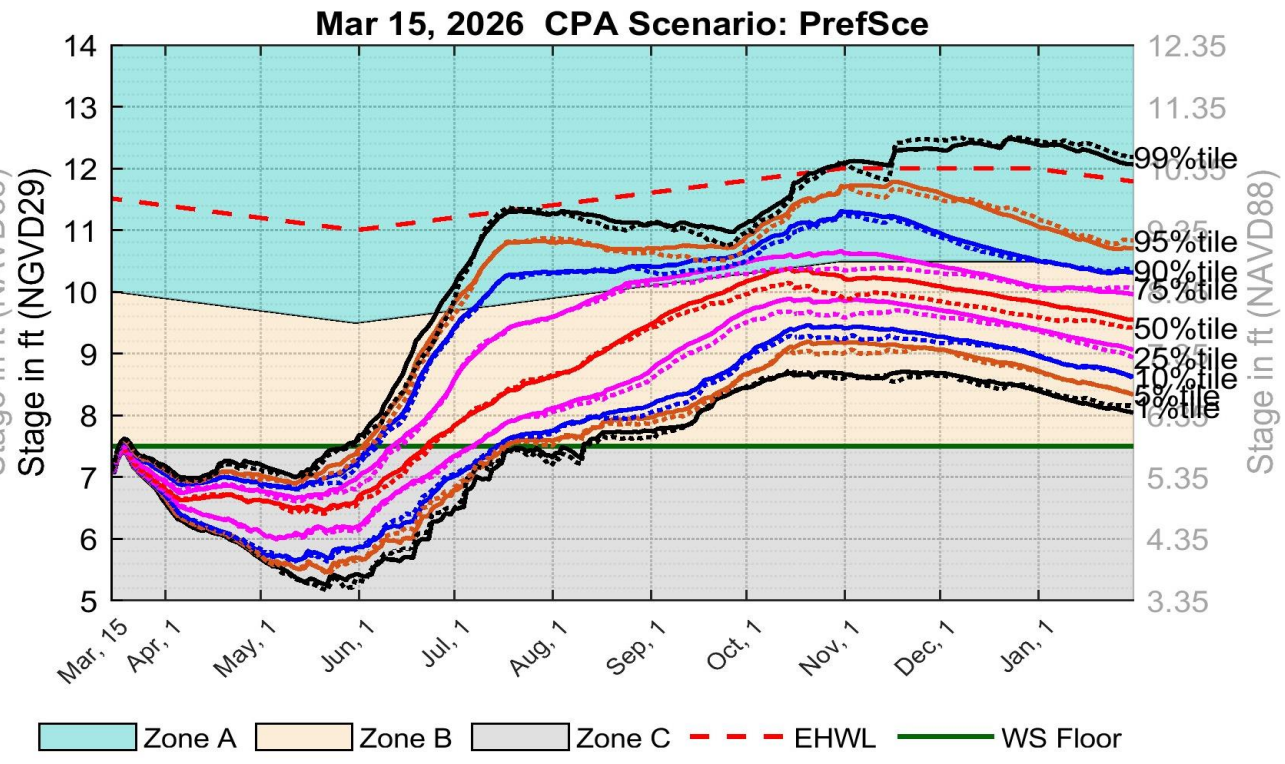
CPC

WCA3A Site 69W



PrefSce

WCA3A Site 69W



Initial stage values are adjusted in DPA and CPA to align with the observed condition for this site

Secondary vertical axis shows stages in NAVD88. These stages are based on Agreed Upon Regulation Schedule Conversion Offsets between NGVD29 and NAVD88 (1.65 ft for WCA3A Site 69W).