Georgia Department of Natural Resources
2 Martin Luther King Jr., Drive, Suite 1152 East Tower, Atlanta, Georgia 30334
Noel Holcomb, Commissioner
Carol A. Couch, Ph.D., Director
Environmental Protection Division
(404) 656-4713

February 11, 2008

Colonel Byron G. Jorns, District Commander
Department of the Army
Mobile District, U.S. Army Corps of Engineers
ATTN: CESAM-DE
Post Office Box 2288
Mobile, Alabama 36628-0001

Dear Colonel Jorns:

In order to preserve valuable storage in Lake Lanier for future use during this exceptional drought, the Georgia Environmental Protection Agency (EPD) has evaluated the use of a lower minimum flow of the Chattahoochee River at Peachtree Creek. Our analysis shows that a lower flow of 550 cfs meets all criteria and we hereby request that the releases from Lake Lanier use 550 cfs rather than 750 cfs as the minimum flow at Peachtree Creek beginning immediately and continuing through April 30, 2008. We have evaluated the regulatory basis for this request, which is summarized in Attachment A – Regulatory Information.

EPD analyzed the water quality issues using the Division's hydrodynamic and water quality model EPDRiv1 for the Chattahoochee River between Buford Dam and West Point Lake. Our water quality modeling indicates that the dissolved oxygen water quality criteria can be met with the reduced flows. More information is included in Attachment B. The Georgia EPD intends to monitor dissolved oxygen near the Dog River during the period of reduced flow.

Additionally, we evaluated the effect of the reduced flow on water levels in the reservoirs and at water intake locations along the river to Columbus, Georgia. This reduced flow at Peachtree Creek protects the storage and associated lake levels. All drinking water withdrawals are also protected with this reduced flow. More detailed information is included in Attachment C – Water Quantity Information.

All of these analyses were conducted with the assumption of reduced flows (including 650 cfs, 600 cfs, and 550 cfs) for all of calendar year 2008. At this time our request is to reduce flows to 550 cfs through April 30, 2008. We propose to use an adaptive management approach regarding the minimum flow as actual water quality data is collected and as other actual data and information become clear.

Therefore, based on our analyses, we request that the releases from Lake Lanier use 550 cfs rather than 750 cfs as the minimum flow at Peachtree Creek beginning immediately and continuing through April 30, 2008.

Sincerely,

Carol A. Couch
Director

CAC:ypf

Attachment A
Regulatory Information

Georgia Water Quality Control Rules state:

- "Specific criteria or standards … apply to all flows on regulated streams." (391-3-6-.03(9))
- The Chattahoochee River from Atlanta (Peachtree Creek) to Cedar Creek is classified as "fishing" with the following footnote: "Specific criteria apply at all times when the river flow measured at a point immediately upstream from Peachtree Creek equals or exceeds 750 cfs measured at a point immediately upstream from Peachtree Creek equals or exceeds 750 cfs (Atlanta gage flow minus Atlanta water supply withdrawal)." (391-3-6-.03(14)(2))
- The fishing criteria are given in 391-3-6-.03(6)(c). The controlling parameter is dissolved oxygen. The rules include "(i) Dissolved oxygen: … A daily average of 5.0 mg/l and no less than 4.0 mg/l at all times for waters supporting warm water species of fish."

The Georgia Environmental Protection Division, consistent with our rules, finds that flows at Peachtree Creek (a regulated stream) can be reduced below 750 cfs if the dissolved oxygen water quality criteria can be met.

Attachment B
Water Quality Analysis

Water Quality Modeling

Water quality modeling was used to assess the effect of reducing Chattahoochee River flows to 550 cfs at Peachtree Creek on instream dissolved oxygen concentrations. Modeling was performed using the Division's hydrodynamic and water quality model EPDRiv1 for the Chattahoochee River between Buford Dam and West Point Lake. This model is also used to develop waste load allocations for the River.

The water quality modeling included the following assumptions:

- 1994-1995 meteorological data, including a very warm week in August (where the dissolved oxygen is the lowest)
- Water withdrawals based on actual 2007 data
- Wastewater treatment plant discharges based on actual 2007 data

We analyzed two yearlong runs:

- Tributary flows at monthly 7Q10 flows
- Tributary flows at 50% of monthly 7Q10 flows

Results

Results with both tributary flows indicate that the dissolved oxygen water quality standard is met with flows as low as 550 cfs, as shown in Figures B-1 and B-2.

The Georgia Environmental Protection Division will monitor dissolved oxygen near the Dog River during the period of reduced flow. An adaptive management approach will be used as actual data is collected.

Attachment C
Water Quantity Analysis

EPD evaluated the potential of reducing flow at Chattahoochee River at Atlanta, Georgia (USGS 02336000, referred to as Peachtree Creek Gage hereafter). The current minimum flow requirement is 750 cfs. The ongoing Exceptional Drought has been impacting the state and the Apalachicola-Chattahoochee-Flint basin in particular. In order to preserve the invaluable storage in Lake Lanier for the possibility of a more severe and prolonged drought, EPD has evaluated the potential of reducing the 750 cfs minimum flow requirement at the above-mentioned gauging station.

Reservoir System Analysis

Water quantity models were constructed with the following assumptions:

- Flow of 550 cfs at the Peachtree Creek gage
- Current level of consumptive water use
- Flow of 1850 cfs (when West Point Elev > 621.6 ft) and 1200 cfs (when West Point Elev ≤ 621.6 ft) at Chattahoochee River at US 280, near Columbus, Georgia (USGS 02341505)
- System operation as described by the Army Corps of Engineers' Exceptional Drought Operations (EDO)
- Initial reservoir conditions recorded as of January 1, 2008
- Two separate hydrological assumptions:
    - Year 2000 hydrology with recorded incremental inflow (tributary inflow)
    - Year 2000 hydrology with monthly 7Q10 level incremental inflow for the reaches upstream of Chattahoochee River near Whitesburg (USGS 02338000) and below Buford Dam

The impact of the contemplated changes was analyzed in the form of comparisons between the effects of 750cfs and 550 cfs Peachtree Creek Gage flow on Lanier elevation, West Point elevation, Walter F. George elevation, and flow at Chattahoochee River at US 280, near Columbus, Georgia (USGS 02341505). The results are shown in Figures 1-8.

The modeling shows that the potential reduction in the flow at the Peachtree Creek gage may preserve 30,000 to 50,000 acre-feet of storage in Lanier, the headwater reservoir in the ACF system. The downside of this change is insignificant.

The modeling used initial conditions of January 1, 2008, with West Point elevation lower than its winter rule curve (628 feet) and the approved variance of 630 feet (temporary rule curve). Currently, West Point elevation is at 631.4 feet, well into the flood control pool. Walter F. George is only 6 inches from the approved variance (temporary rule curve) of 190 feet. Given the status of the two lower reservoirs, the impact of any reduction in flow at the Peachtree Creek gage would likely be less than shown with the models.

Results at Reservoirs and Control Point

Water quantity modeling was performed using two separate sets of hydrological data – 1) using year 2000 hydrology in most reaches but with 7Q10 incremental flow and 2) using year 2000 hydrology (and by default recorded 2000 incremental flow)

1. Using year 2000 hydrology in most reaches but with 7Q10 incremental flow

By definition, 7Q10 level flow is the 7-day average flow that is not exceeded only 10% of the time. It is a low flow threshold, and observed flow would be lower than this threshold no more than 10% of the time. So, the assumption of using monthly 7Q10 level incremental flow for inflow to the system for the upper Chattahoochee reaches (between Buford Dam/Lake Lanier and Whitesburg gage) for every day of the simulation is rather conservative, i.e. testing the system with extreme stress.

Under this synthetic hydrology and its extreme stress on the system, a reduction of the 750 cfs flow to 550 cfs at the Peachtree Creek Gage would result in a 1.6 feet higher Lanier elevation toward the end of this year. Regardless of the flow at Peachtree Creek Gage, under this hydrology, Lanier would remain in Zone 4 for the entire 2008, as shown in Figure C-1.

This reduction will also result in slightly lower West Point elevations. West Point elevation would be less than a foot lower toward the end of 2008. Under both flows at Peachtree Creek Gage, West Point would start the year in Zone 1, be lowered in the course of the summer and fall to Zones 2, 3, and 4, and end the year in Zone 3, as shown in Figure C-2.

This reduction will not result in substantial elevation difference at Walter F. George. George would start the year at above rule curve and end the year at rule curve, regardless of the flows at Peachtree Creek Gage, as shown in Figure C-3.

Flows at Columbus, Georgia will be met regardless of what requirement is in place at Peachtree Creek Gage. There would be a brief period when flow is lowered from 1,850 cfs to 1,200 cfs because West Point would be briefly below elevation 621.6 feet, triggering a lower flow as shown in Figure C-4.

2. Using year 2000 hydrology (and by default recorded 2000 incremental flow)

The drought that took place around the year 2000 was the worst on record. Even though it is likely that the hydrology in 2007 will replace that record, it is not available in existing Unimpaired Flow data and can not be used for modeling purpose. We used the drought of record to assess the impact of the potential flow reduction.

Under year 2000 hydrology, the flow reduction at Peachtree Creek Gage would result in a 1.1 feet higher Lanier elevation. Under both flows, Lanier would start the year in Zone 4, stay in Zone 4 for almost the entire year. Under the 550 cfs flow scenario at Peachtree Creek Gage, Lanier elevation would barely touch the divide between Zones 3 and 4 toward the end of 2008, as shown in Figure C-5.

The potential reduction in flow at Peachtree Creek Gage would not result in substantial elevation differences at either West Point or Walter F. George. Regardless of the flow at Peachtree Creek Gage, West Point elevation would start in Zone 1, be lowered to Zones 2, 3, and 4 in the summer, and recover to Zone 2, as shown in Figure C-6. Walter F. George would start the year at rule curve, be lowered to no more than top of Zone 3, and return to rule curve toward the end of the year, as shown on Figure C-7.

Flows of 1,850 cfs at Columbus, Georgia would be met all the time, regardless of the Peachtree Creek Gage flow, as shown on Figure C-8.

Elevation Impacts on Water Users

Our analysis included an evaluation of the river stage as compared to necessary operating levels for water withdrawals. The following summary and associated graphs illustrate the necessary operating levels as compared to the river gage when the flow at Peachtree Creek is at 650 cfs, 600 cfs, and 550 cfs. The necessary levels were determined through discussions with the facility operators. These operating levels are not the level of the intakes, but the required minimum water surface elevation for proper operation.

- **Trout Hatchery at Buford Dam** – For all flows, the river gage is more than 8 feet above the desired operating level, as shown in Figure C-9
- **Atlanta-Fulton Water Intake** - For all flows, the river gage is more than 6 inches above the desired operating level, as shown in Figure C-10
- **DeKalb intake near Norcross** - For all flows, the river gage is more than 1.5 feet above the desired operating level, as shown in Figure C-11
- **Cobb intake below Morgan Falls** - For all flows, the river gage is more than 10 feet above the desired operating level, as shown in Figure C-12
- **City of Atlanta intake and Plant McDonough intake at Peachtree Creek** - For all flows, the river gage is more than 4 feet above the Atlanta desired operating level and more than 12 feet above the McDonough desired operating level, as shown in Figure C-13
- **Plant Yates near the Whitesburg gage** - For all flows, the river gage is approximately 0.5 feet above the desired operating level for the most critical month, as shown in Figure C-14

Conclusions

The modeling shows that the potential reduction in flow at Peachtree Creek Gage may preserve 30,000 to 50,000 acre-feet of storage in Lanier, the headwater reservoir in the ACF system. The downside of this change is insignificant.

Our modeling used initial conditions of January 1, 2008 with West Point elevation lower than its winter rule curve (628 feet) and the approved variance of 630 feet (temporary rule curve). As of today, West Point elevation is at 631.4 feet, well into the flood control pool. Walter F. George is only 6 inches from the approved variance (temporary rule curve) of 190 feet. In other words, these two lower reservoirs are full.

Given the status of the two lower reservoirs, the impact of any reduction in flow at Peachtree Creek Gage would likely be less than shown with the models.

The reduced flows protect all water intakes between Buford Dam and the Whitesburg gage.

Figure B-1
Chattahoochee River Dissolved Oxygen Concentrations
Predicted for Varying Streamflows at Peachtree Creek
(Concentrations shown at minimum location)
(tributaries at estimated monthly 7Q10)

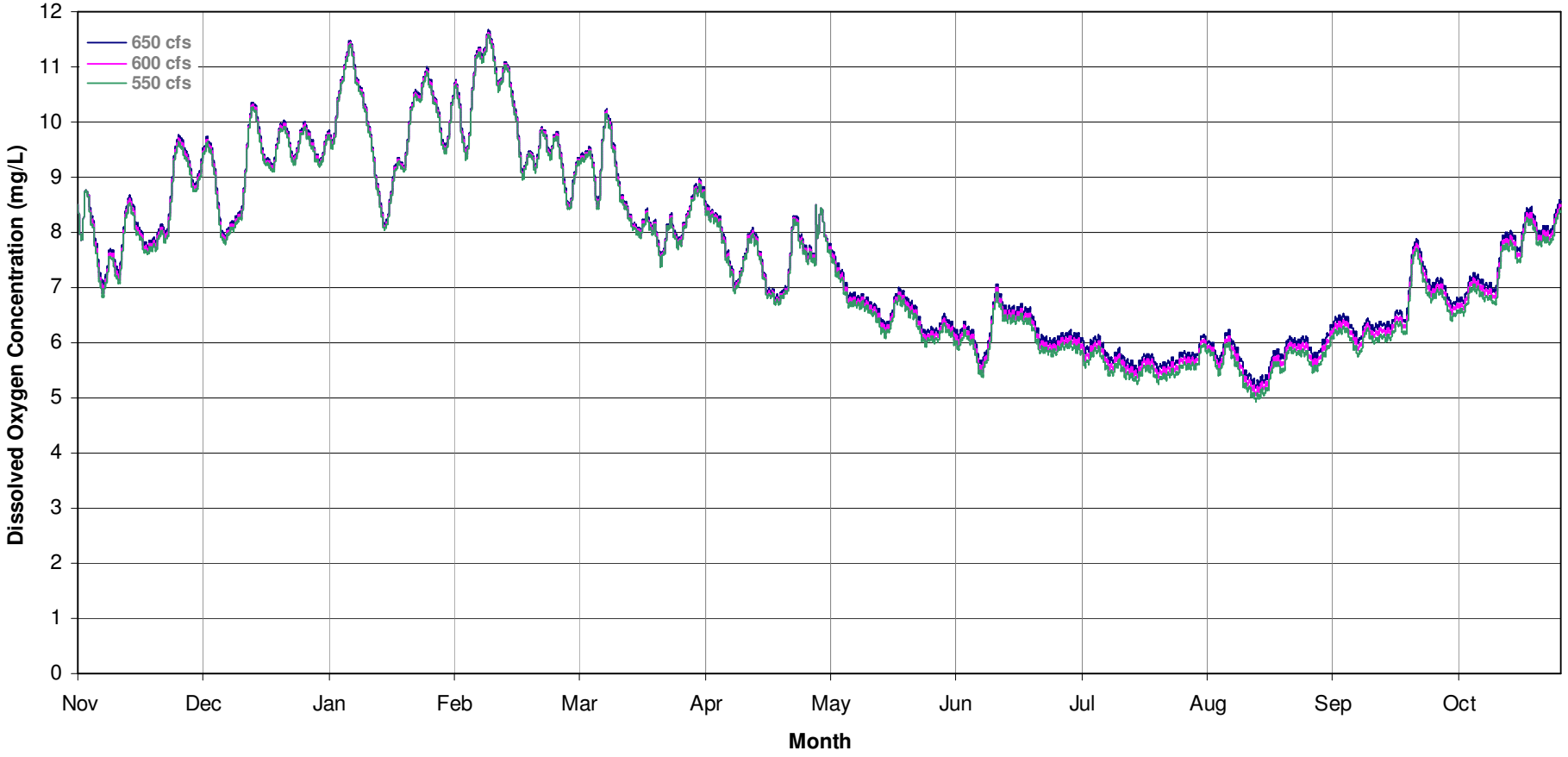


Figure B-2
Chattahoochee River Dissolved Oxygen Concentrations
Predicted for Varying Streamflows at Peachtree Creek
(Concentrations shown at minimum location)
(tributaries at 50% of estimated monthly 7Q10)

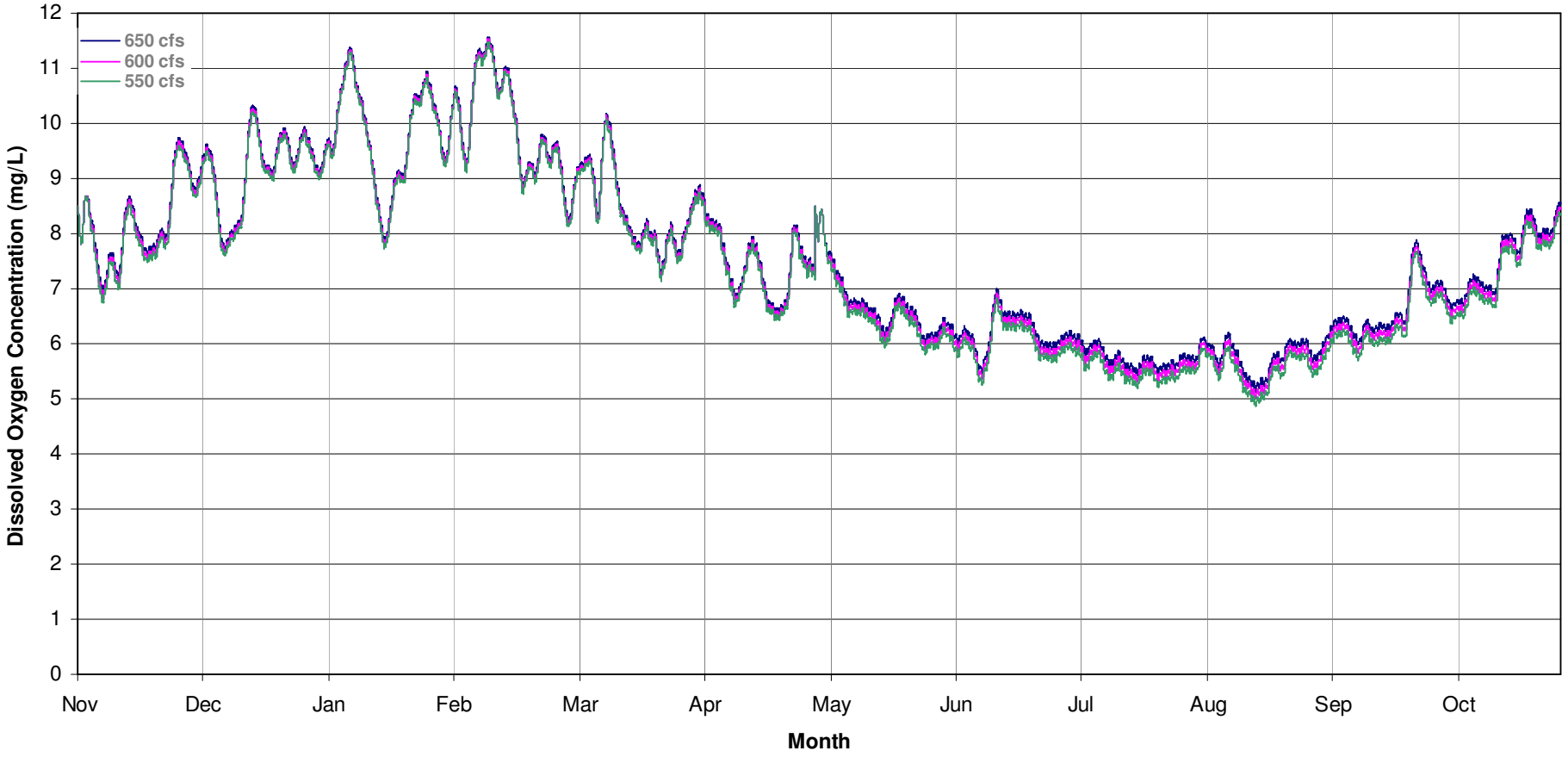


Figure C-1

PREDICTED LAKE LANIER ELEVATION IN 2008

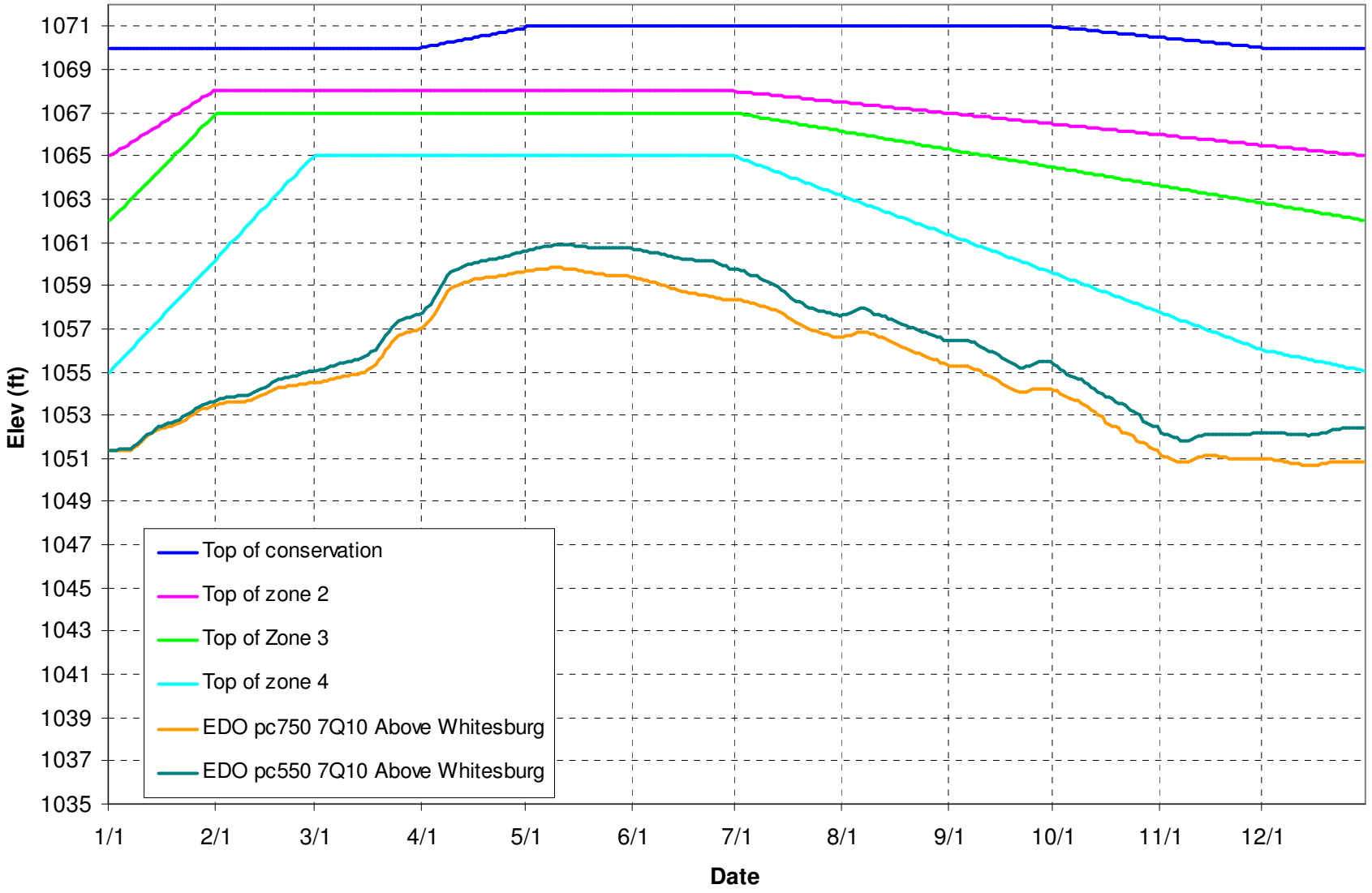


Figure C-2

PREDICTED WEST POINT ELEVATION IN 2008

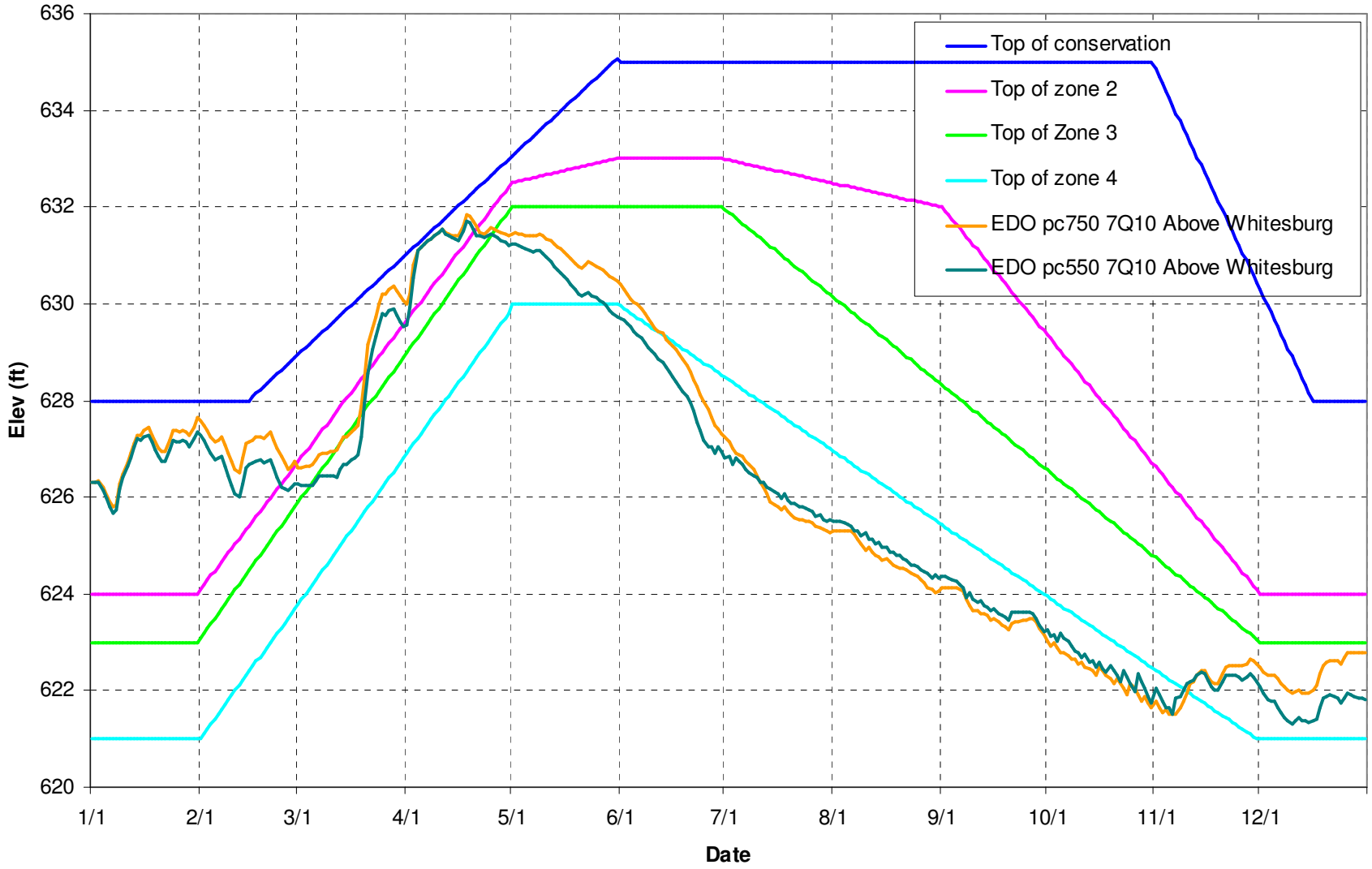


Figure C-3

PREDICTED W.F.GEORGE ELEVATION IN 2008

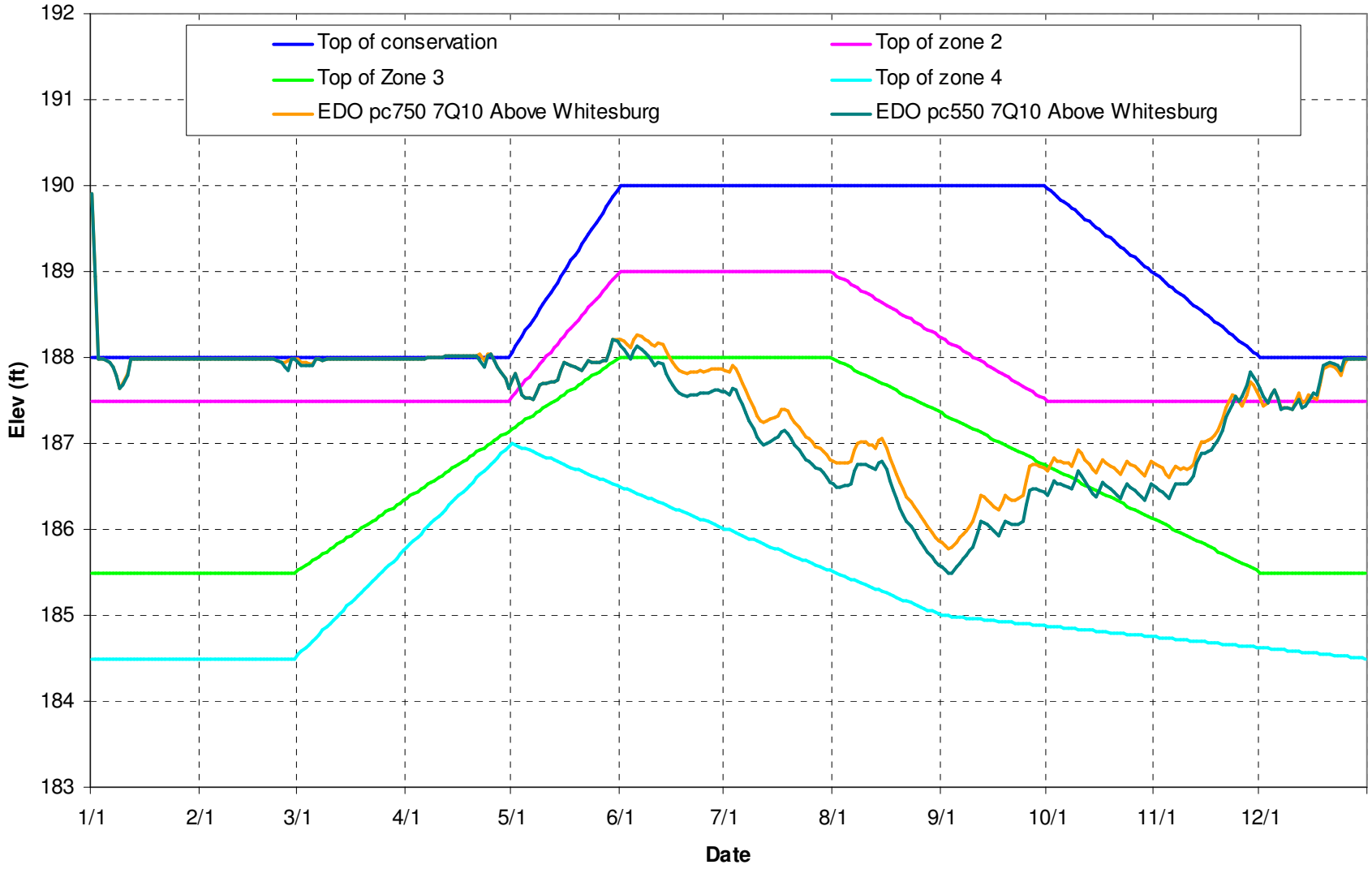


Figure C-4

PREDICTED COLUMBUS DISCHARGE IN 2008

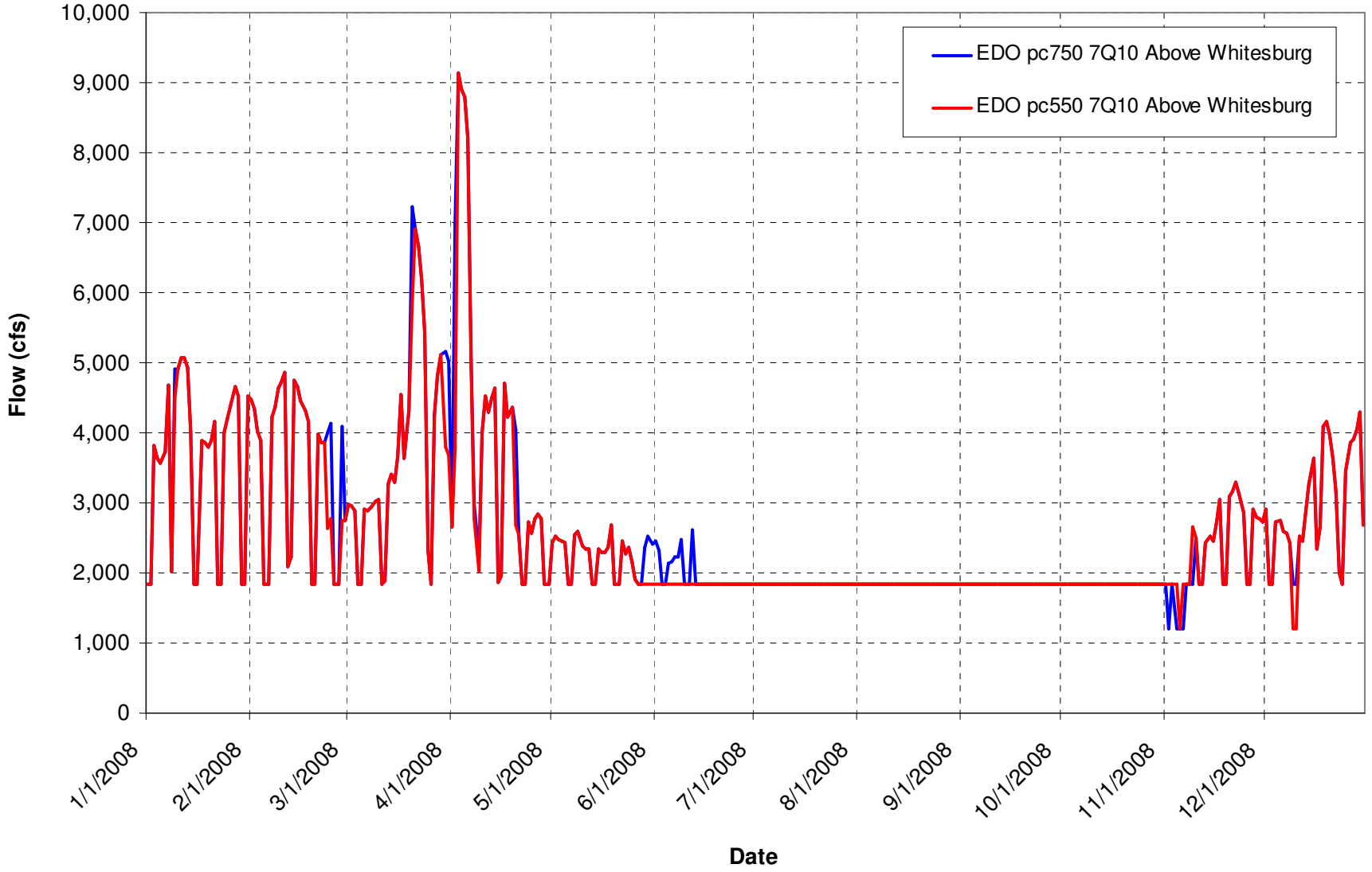


Figure C-5

PREDICTED LAKE LANIER ELEVATION IN 2008

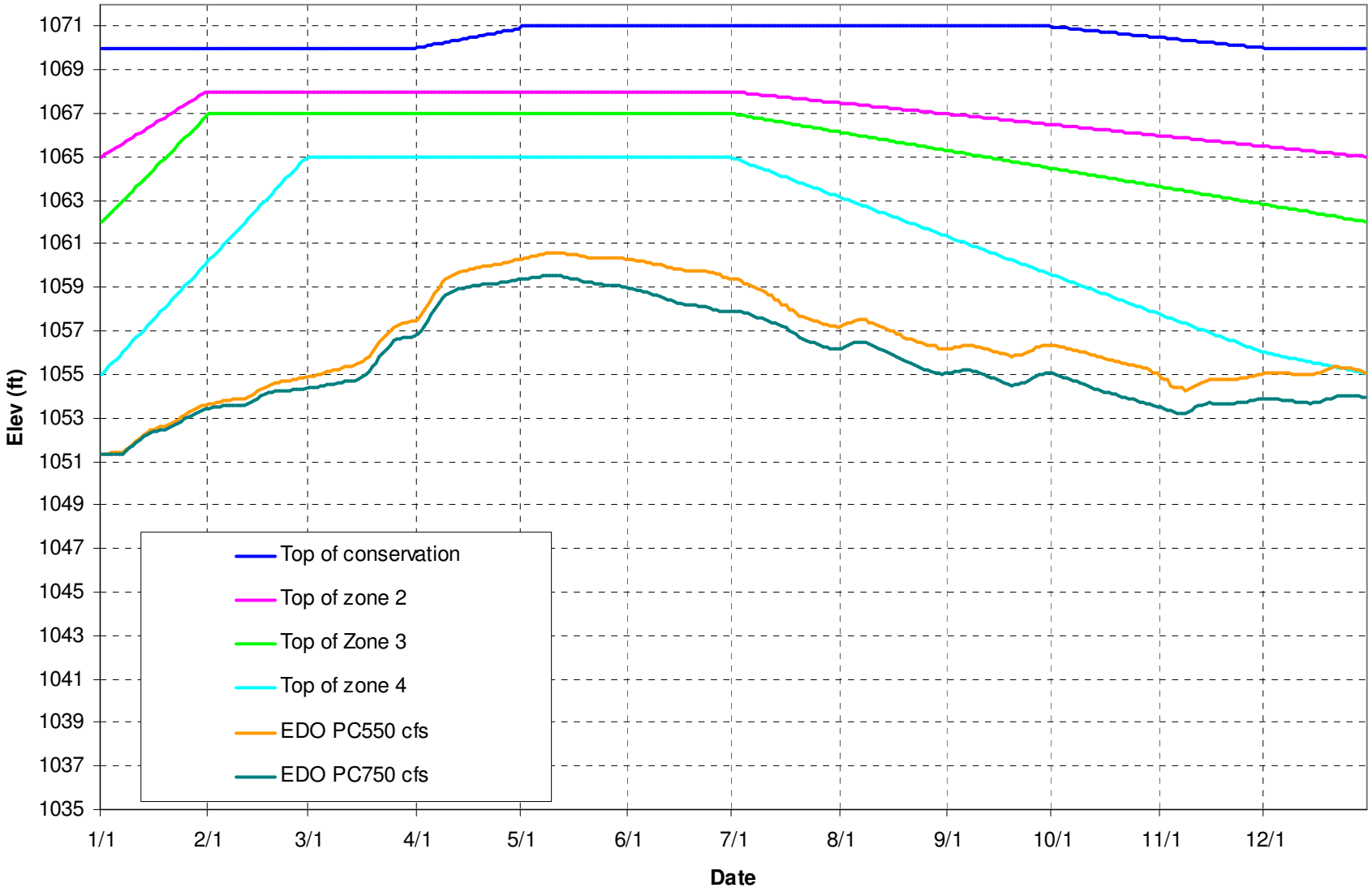


Figure C-6

PREDICTED WEST POINT ELEVATION IN 2008

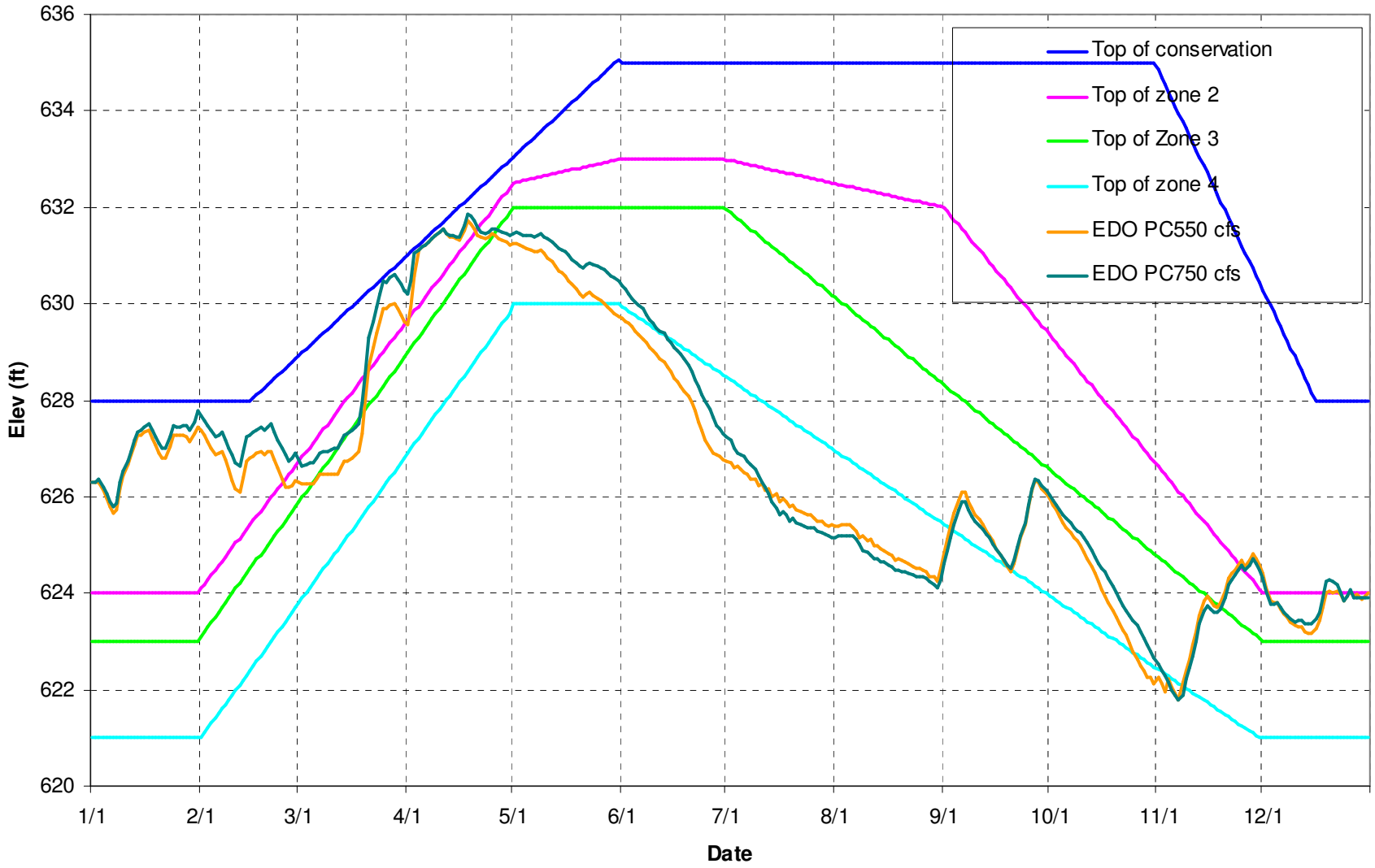


Figure C-7

PREDICTED W.F.GEORGE ELEVATION IN 2008

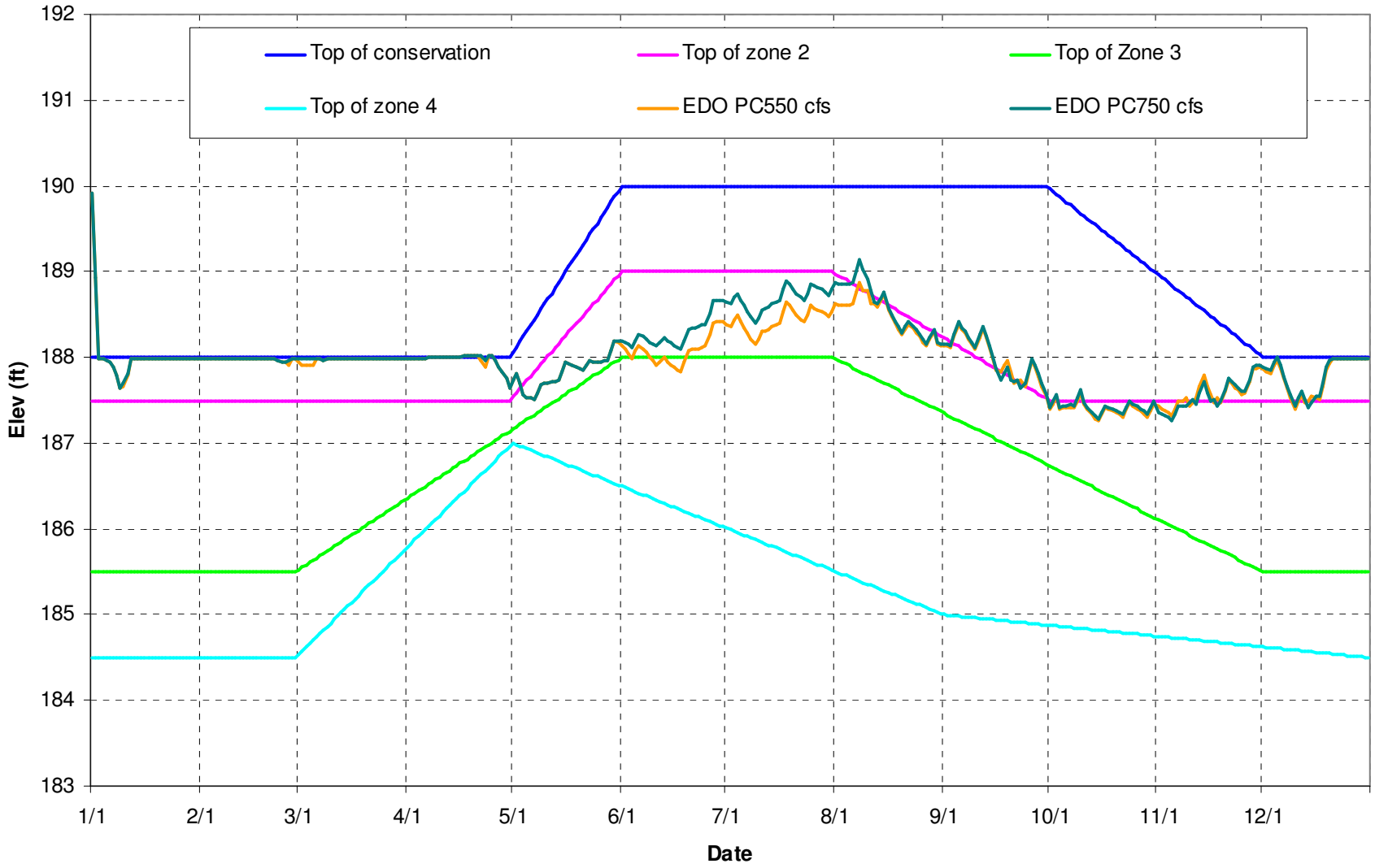


Figure C-8

PREDICTED COLUMBUS DISCHARGE IN 2008

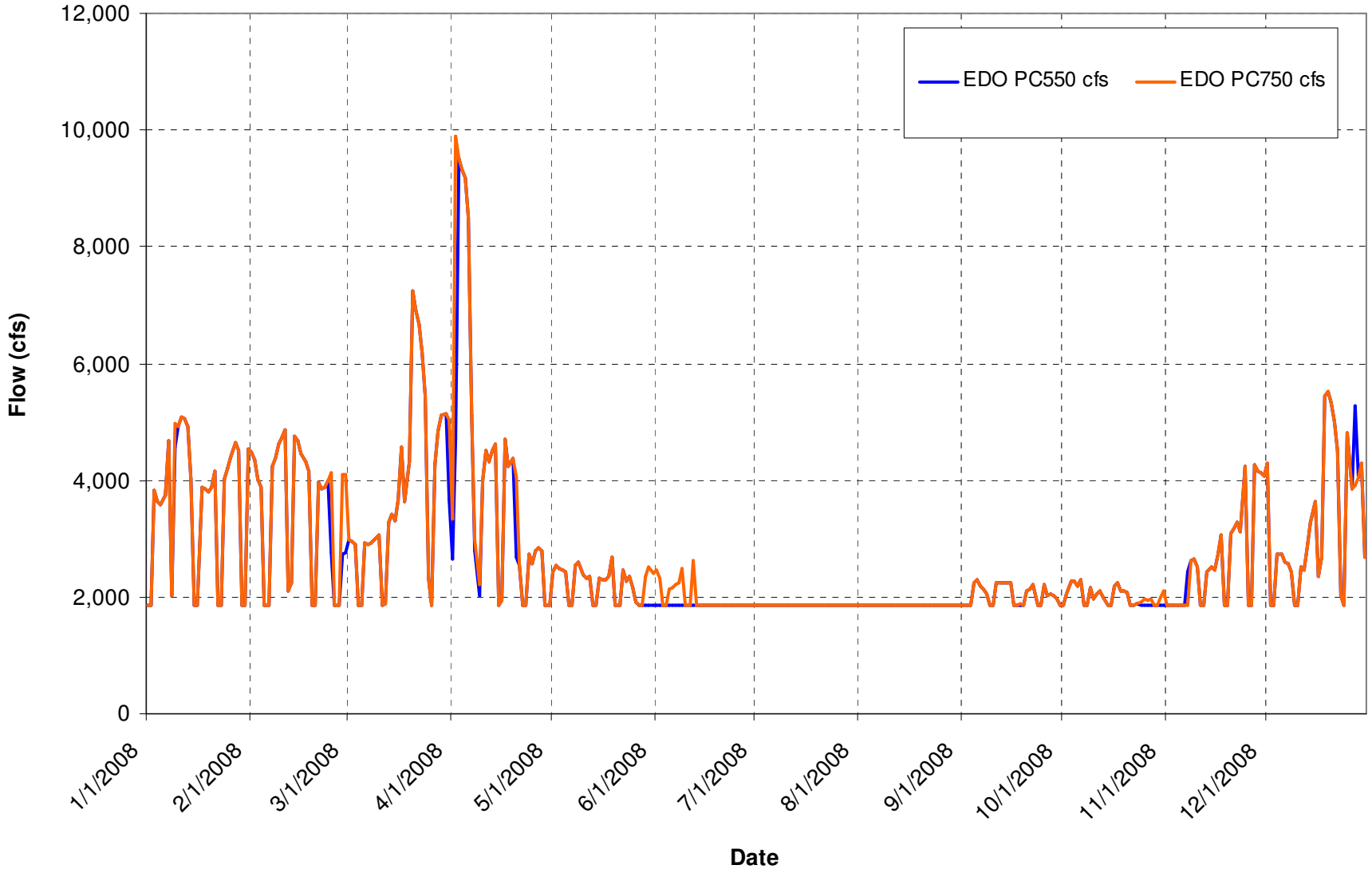
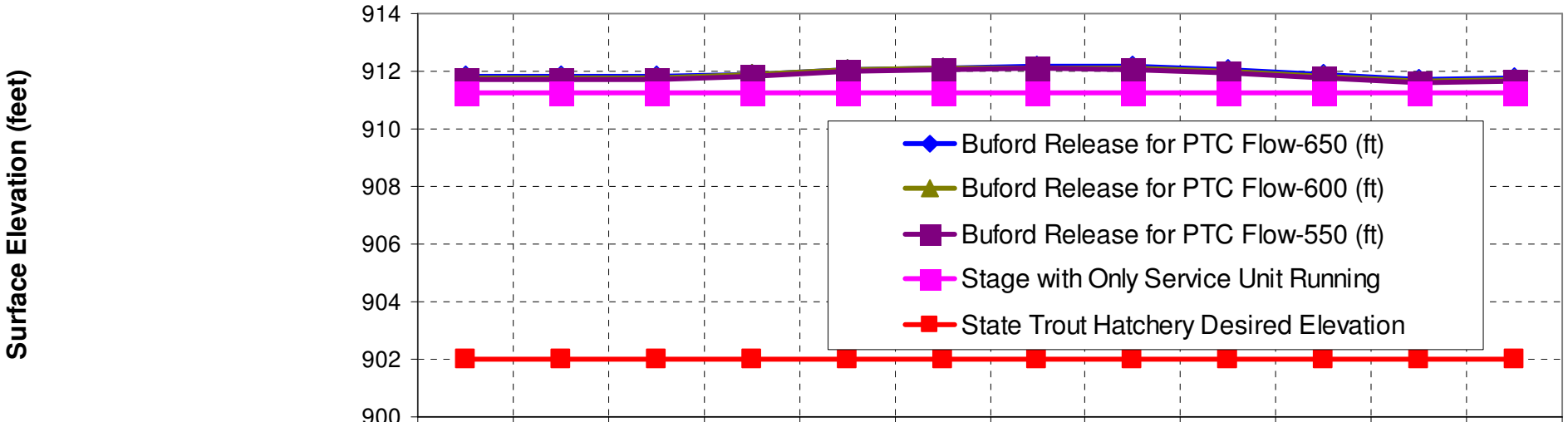
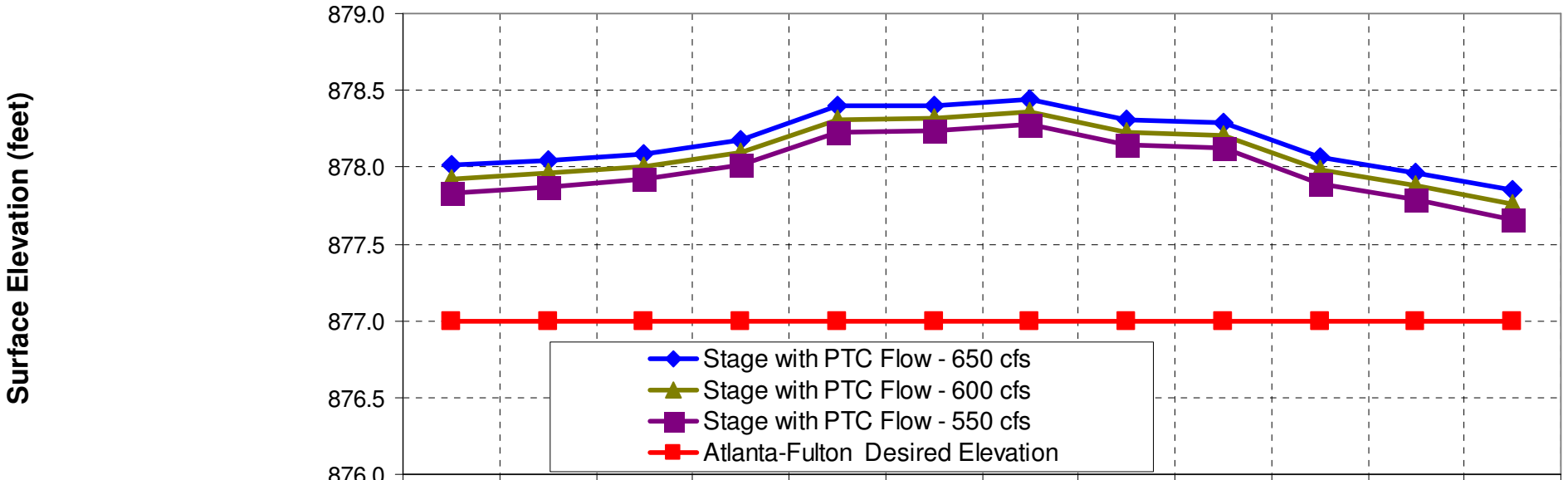


Figure C-9
Stage at Chattahoochee River at Buford Dam
when PTC Flow at 650, 600, and 550 cfs



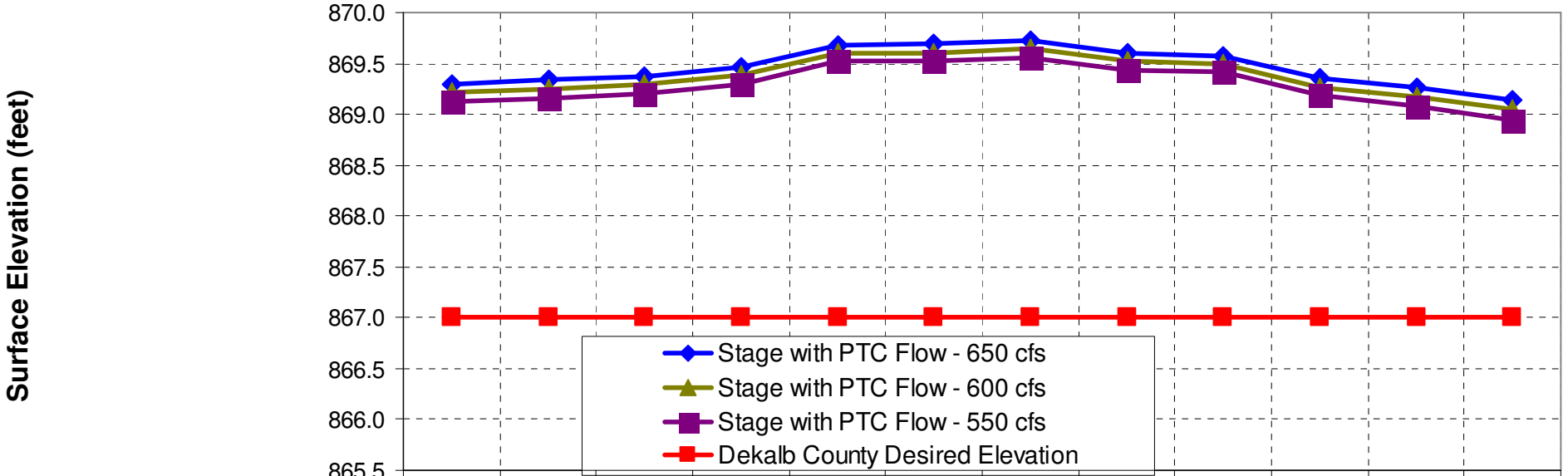
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Buford Release for PTC Flow-650 (ft)	911.8	911.8	911.8	911.9	912.1	912.1	912.2	912.2	912.0	911.9	911.7	911.8
Buford Release for PTC Flow-600 (ft)	911.8	911.8	911.8	911.9	912.0	912.1	912.1	912.1	912.0	911.8	911.7	911.7
Buford Release for PTC Flow-550 (ft)	911.7	911.7	911.7	911.8	912.0	912.0	912.1	912.1	911.9	911.8	911.6	911.7
Stage with Only Service Unit Running	911.2	911.2	911.2	911.2	911.2	911.2	911.2	911.2	911.2	911.2	911.2	911.2
State Trout Hatchery Desired Elevation	902	902	902	902	902	902	902	902	902	902	902	902

Figure C-10
Stage at Atlanta-Fulton Intake downstream of Chattahoochee River near Norcross, when PTC Flow at 650, 600, and 550 cfs



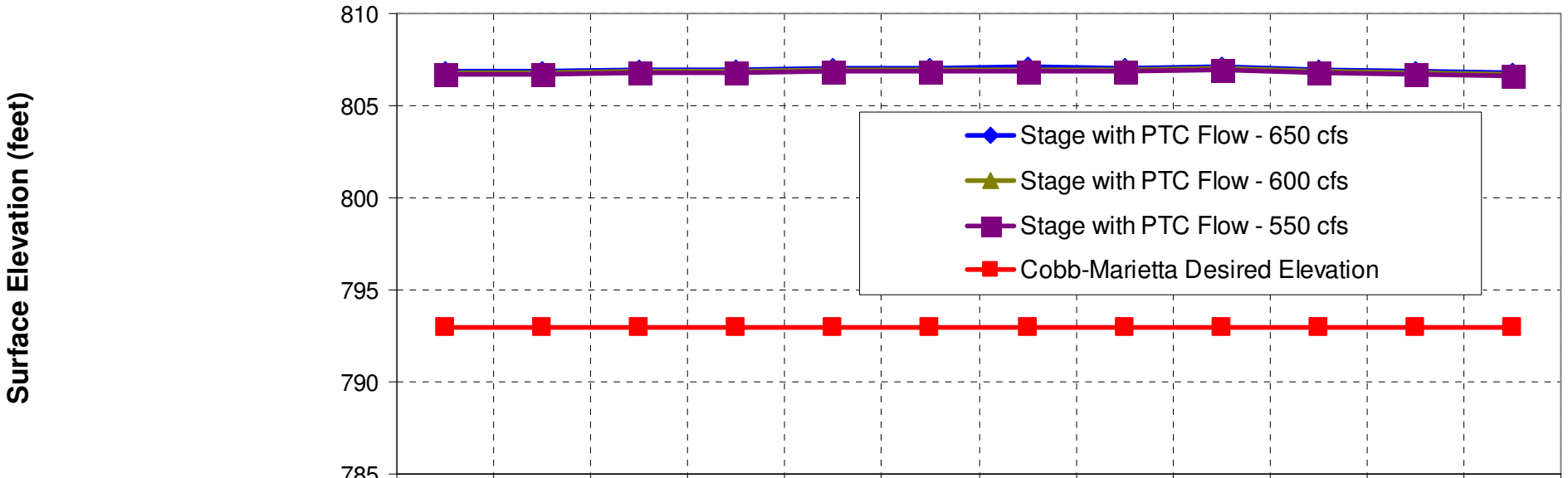
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Stage with PTC Flow - 650 cfs	878.0	878.0	878.1	878.2	878.4	878.4	878.4	878.3	878.3	878.1	878.0	877.8
Stage with PTC Flow - 600 cfs	877.9	878.0	878.0	878.1	878.3	878.3	878.4	878.2	878.2	878.0	877.9	877.8
Stage with PTC Flow - 550 cfs	877.8	877.9	877.9	878.0	878.2	878.2	878.3	878.1	878.1	877.9	877.8	877.7
Atlanta-Fulton Desired Elevation	877	877	877	877	877	877	877	877	877	877	877	877

Figure C-11
Stage at Dekalb Intake downstream of Chattahoochee River near Norcross, when PTC Flow at 650, 600, and 550 cfs



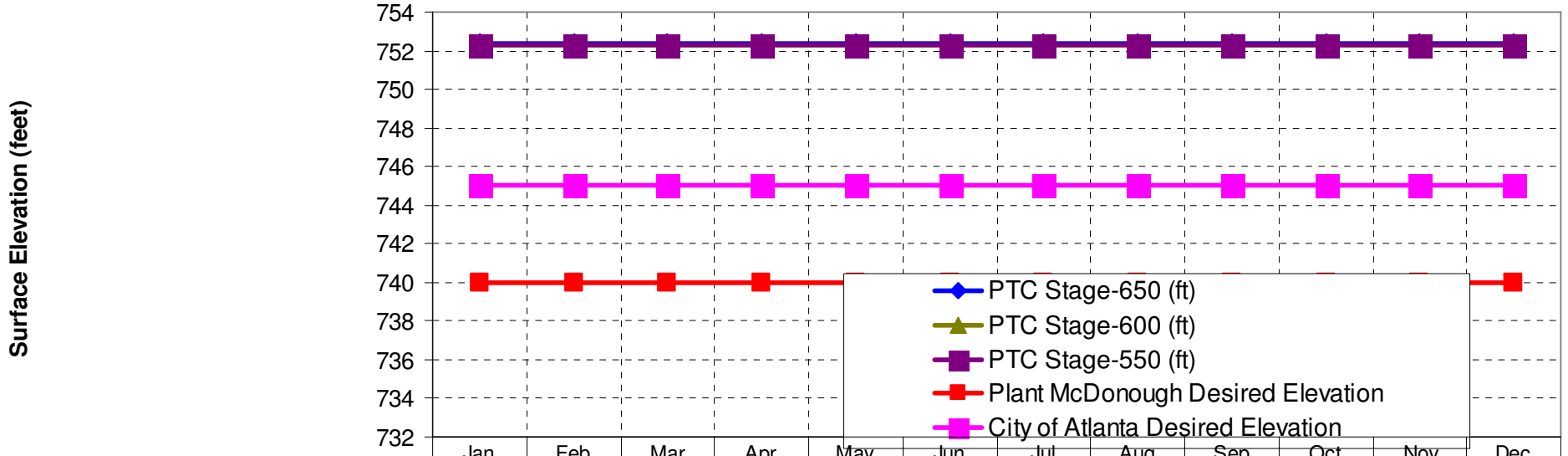
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Stage with PTC Flow - 650 cfs	869.3	869.3	869.4	869.5	869.7	869.7	869.7	869.6	869.6	869.4	869.3	869.1
Stage with PTC Flow - 600 cfs	869.2	869.3	869.3	869.4	869.6	869.6	869.6	869.5	869.5	869.3	869.2	869.0
Stage with PTC Flow - 550 cfs	869.1	869.2	869.2	869.3	869.5	869.5	869.6	869.4	869.4	869.2	869.1	868.9
Dekalb County Desired Elevation	867	867	867	867	867	867	867	867	867	867	867	867

Figure C-12
Stage at Cobb Intake downstream of Chattahoochee River below Morgan Falls, when PTC Flow at 650, 600, and 550 cfs



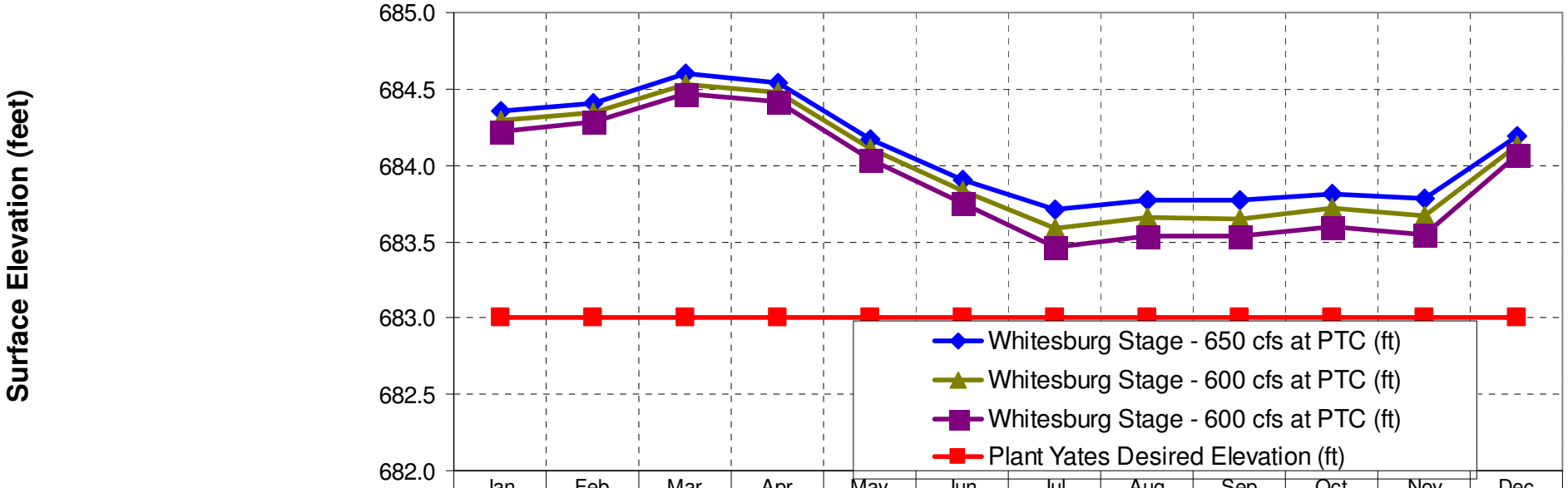
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Stage with PTC Flow - 650 cfs	806.9	806.9	806.9	806.9	807.0	807.0	807.1	807.0	807.1	806.9	806.9	806.8
Stage with PTC Flow - 600 cfs	806.8	806.8	806.9	806.8	806.9	806.9	807.0	806.9	807.0	806.8	806.8	806.7
Stage with PTC Flow - 550 cfs	806.7	806.7	806.8	806.7	806.8	806.9	806.9	806.8	807.0	806.7	806.7	806.6
Cobb-Marietta Desired Elevation	793	793	793	793	793	793	793	793	793	793	793	793

Figure C-13
Stage at Chattahoochee River at Atlanta (PTC)
when PTC Flow at 650, 600, and 550 cfs



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
PTC Stage-650 (ft)	752.4	752.4	752.4	752.4	752.4	752.4	752.4	752.4	752.4	752.4	752.4	752.4
PTC Stage-600 (ft)	752.3	752.3	752.3	752.3	752.3	752.3	752.3	752.3	752.3	752.3	752.3	752.3
PTC Stage-550 (ft)	752.2	752.2	752.2	752.2	752.2	752.2	752.2	752.2	752.2	752.2	752.2	752.2
Plant McDonough Desired Elevation	740.0	740.0	740.0	740.0	740.0	740.0	740.0	740.0	740.0	740.0	740.0	740.0
City of Atlanta Desired Elevation	745	745	745	745	745	745	745	745	745	745	745	745

Figure C-14
Stage at Chattahoochee River near Whitesburg
when PTC Flow at 650, 600, and 550 cfs



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Whitesburg Stage - 650 cfs at PTC (ft)	684.4	684.4	684.6	684.5	684.2	683.9	683.7	683.8	683.8	683.8	683.8	684.2
Whitesburg Stage - 600 cfs at PTC (ft)	684.3	684.3	684.5	684.5	684.1	683.8	683.6	683.7	683.7	683.7	683.7	684.1
Whitesburg Stage - 600 cfs at PTC (ft)	684.2	684.3	684.5	684.4	684.0	683.8	683.5	683.5	683.5	683.6	683.6	684.1
Plant Yates Desired Elevation (ft)	683	683	683	683	683	683	683	683	683	683	683	683