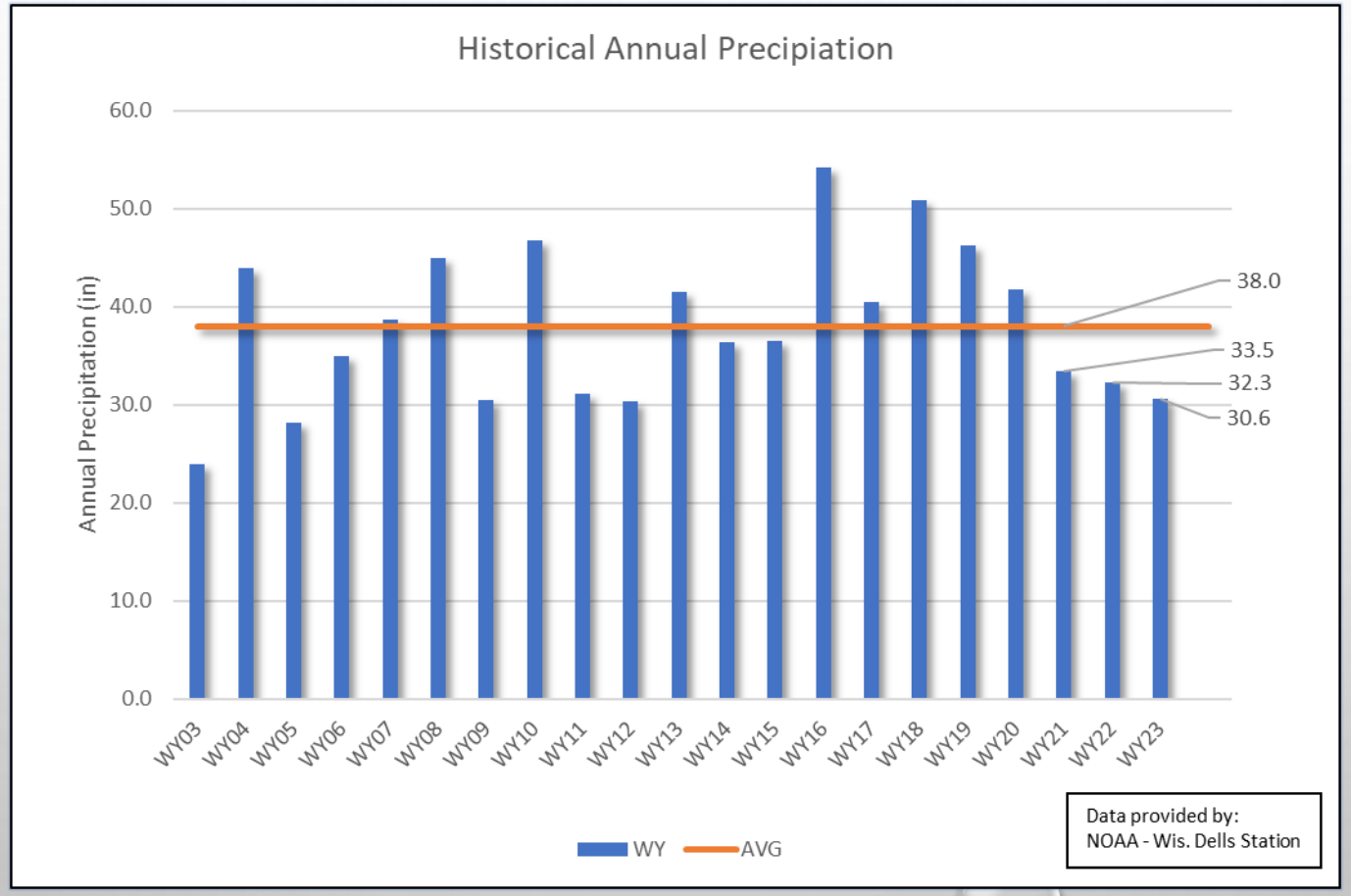
USGS-LAKE REDSTONE WY23 TRIBUTARY MONITORING

<u>Water Year 2023:</u>

- Completed 3rd year of loading data collection on 9/30/23
- Another dry year -- slightly less precip than last year
- WY23 discharge and loads were less than WY21 & WY22

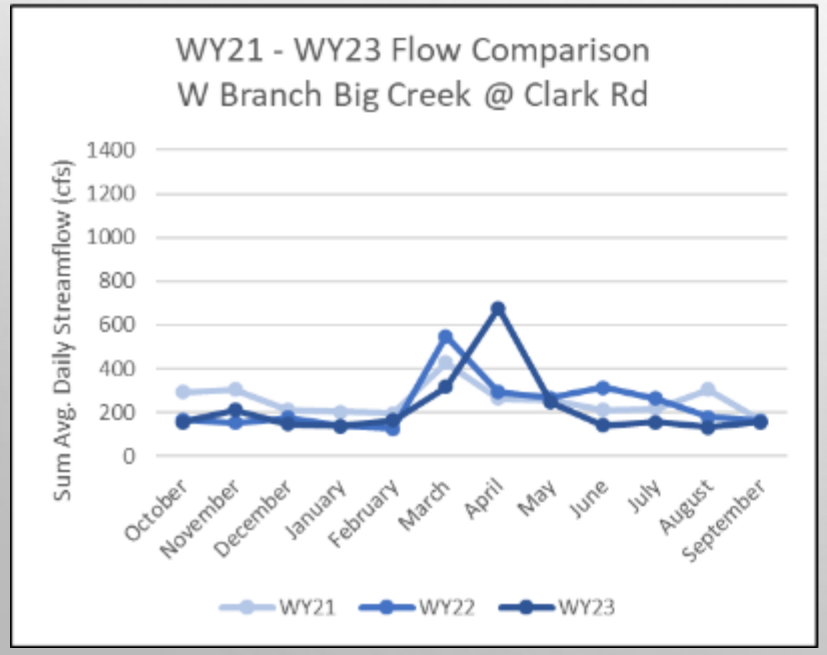
*All data in presentation is preliminary USGS data unless noted otherwise

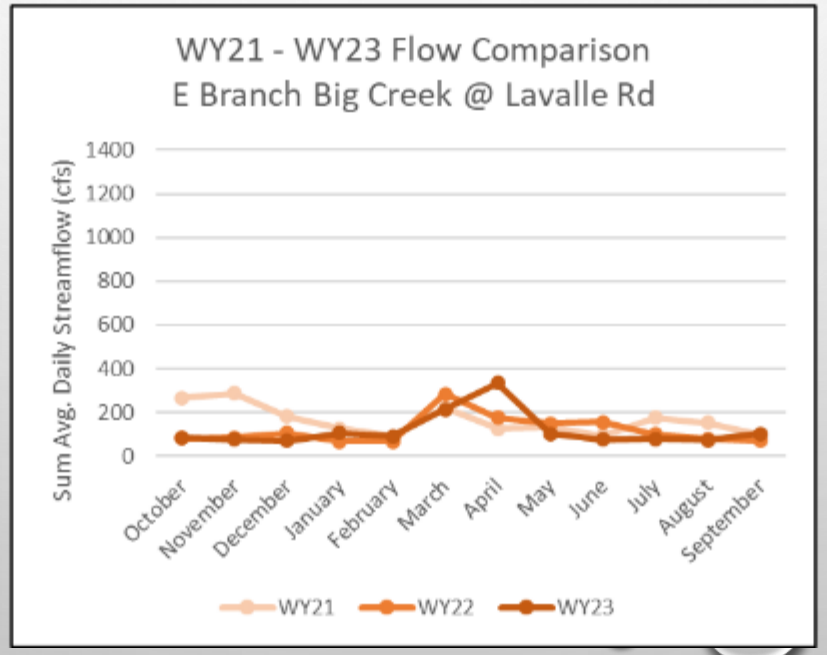
WY23 WAS DRYER THAN AVERAGE… AGAIN

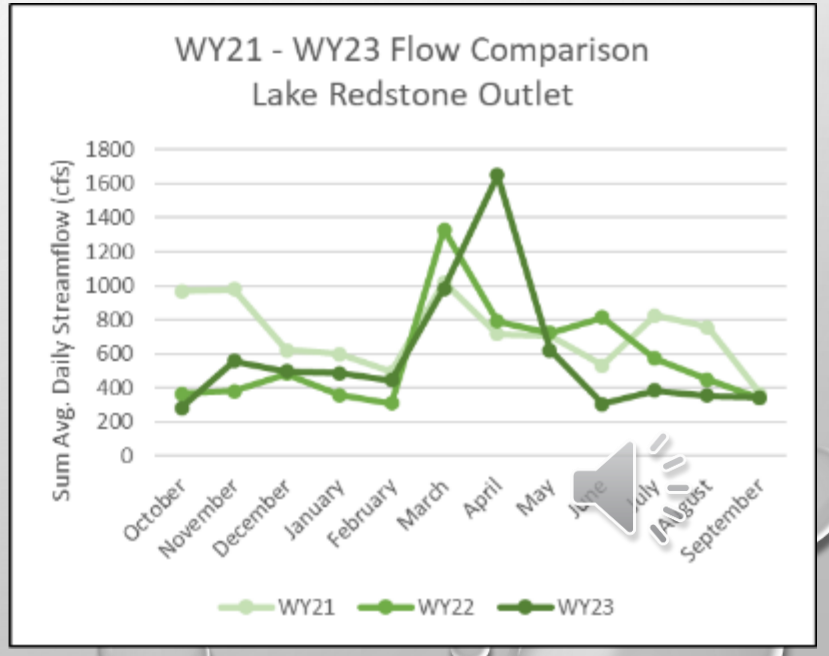


SLIGHTLY LESS RAIN LED TO SLIGHTLY LESS FLOW

- Total volume of water in WY23 was less than WY22 and WY21
- Large snowmelt events in WY23 led to April being the month with most discharge at all three sites

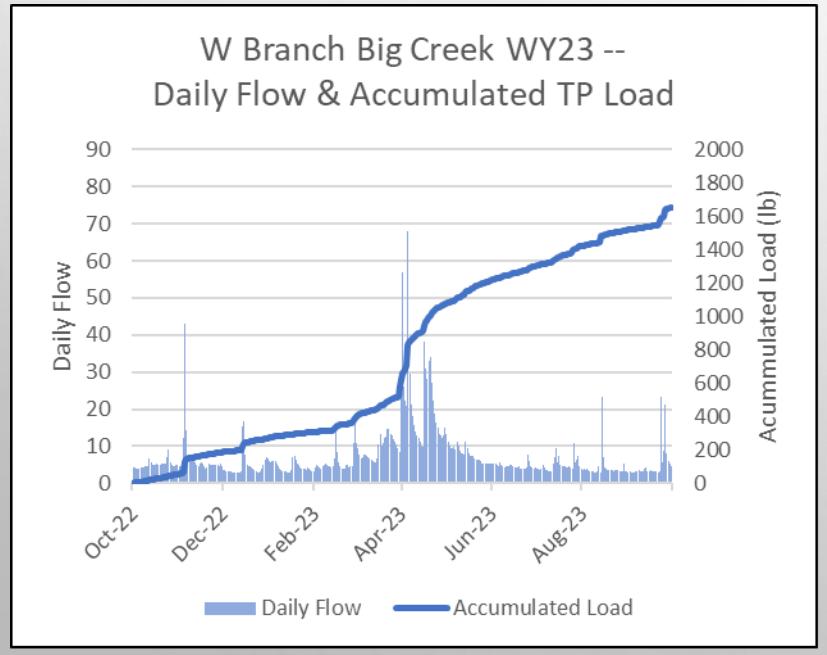


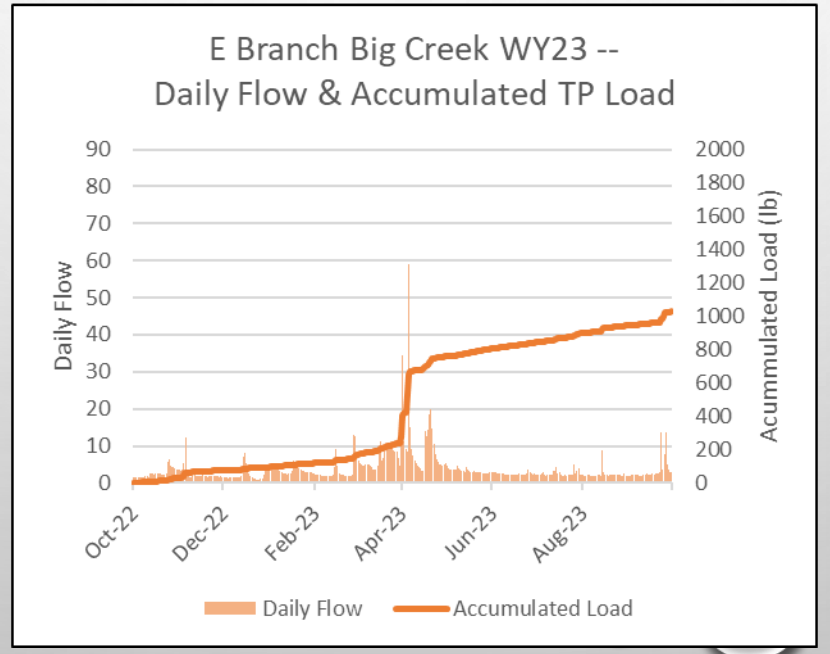


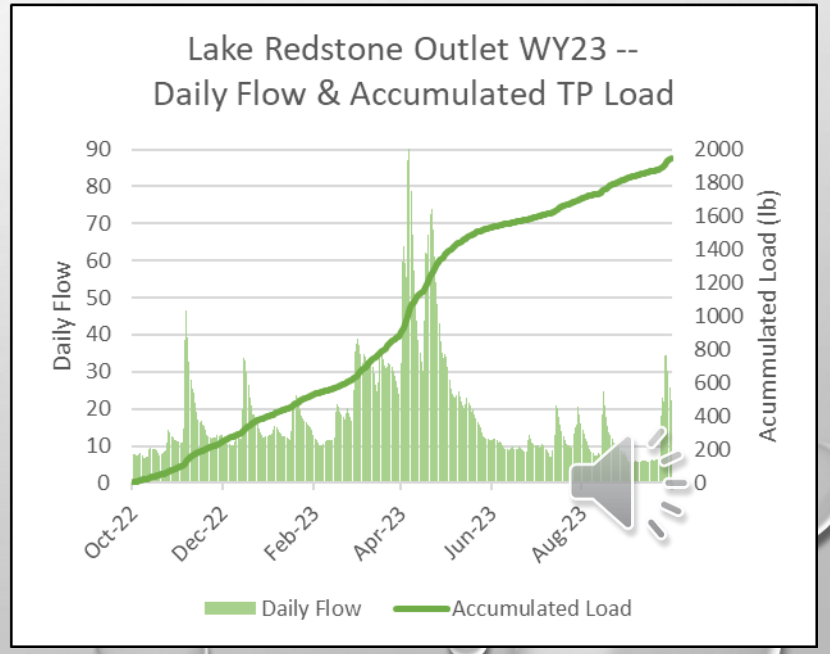


MEASURED WY23 TP LOADS

- WY23 Total Phosphorus Load Measured: LR Outlet > W Branch Big Creek > E Branch Big Creek
- W Branch Big Creek & E Branch Big Creek:
  - Majority of load measured during storm events when flows and concentrations are higher
- Outlet: More steady and consistent loading throughout the year (much less variation in TP concentrations)

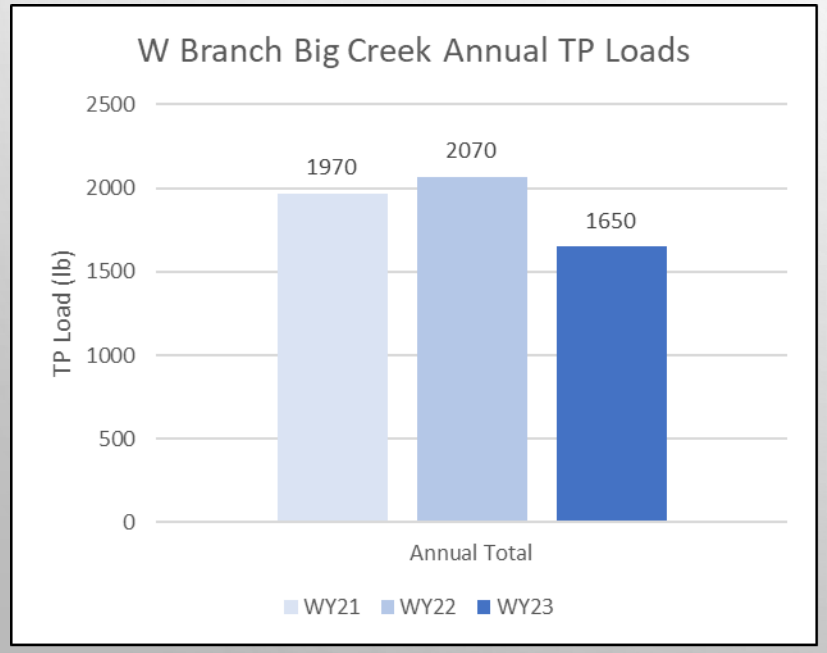


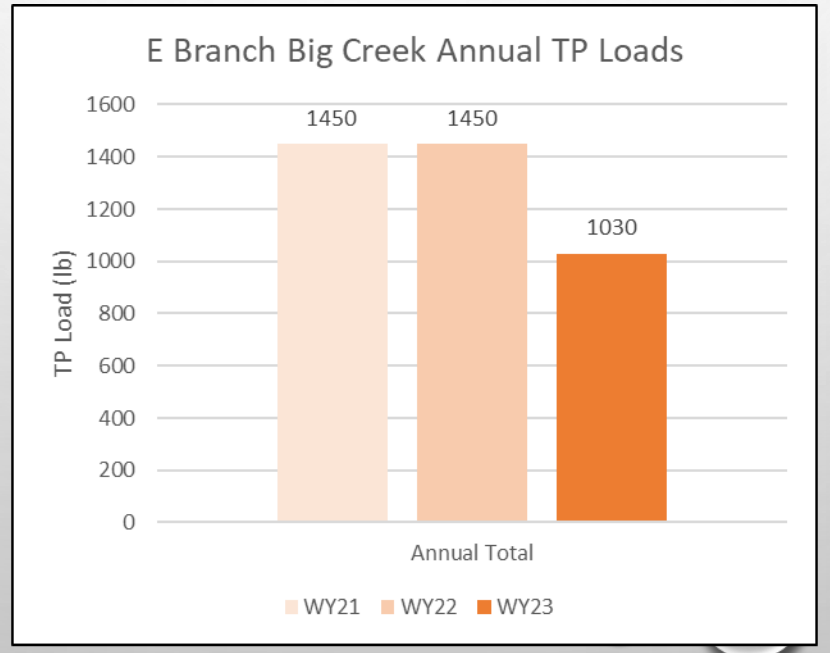


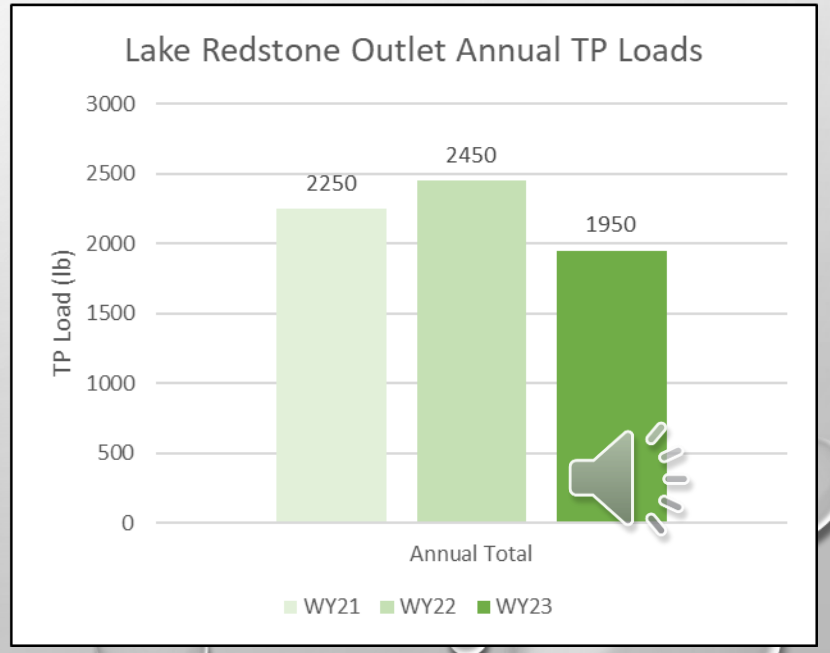


REDUCED TP LOADS IN WY23

- W Br Big Creek: WY22 → WY23 = -420 lb
- E Br Big Creek: WY22 → WY23 = -420 lb
- Lake Outlet: WY22 → WY23 = -500 lb

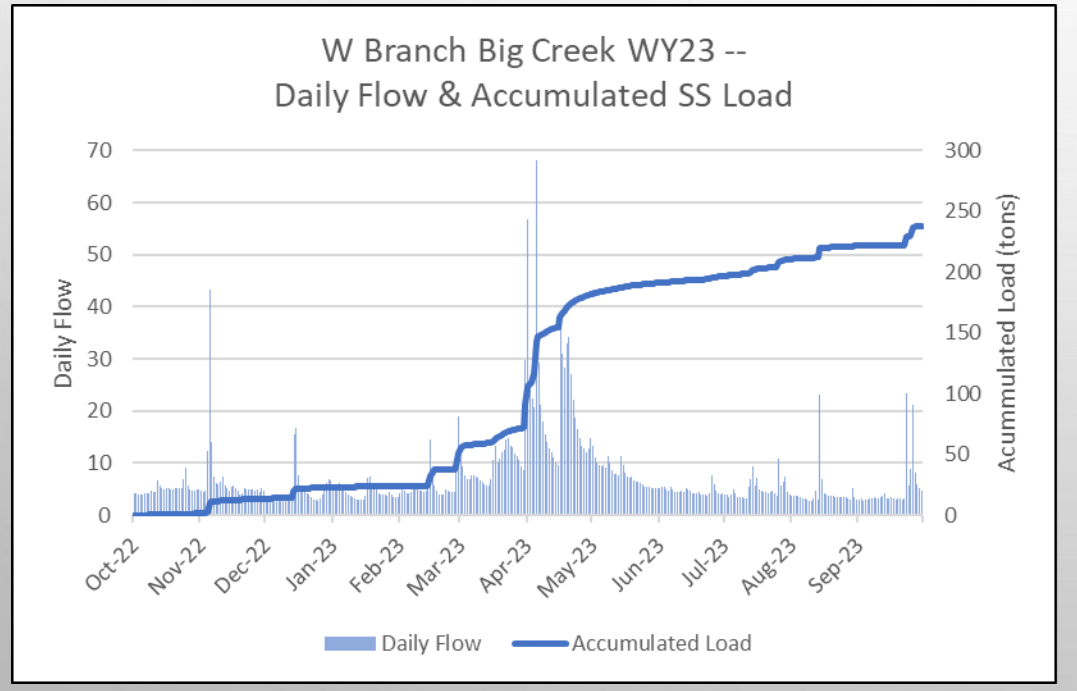


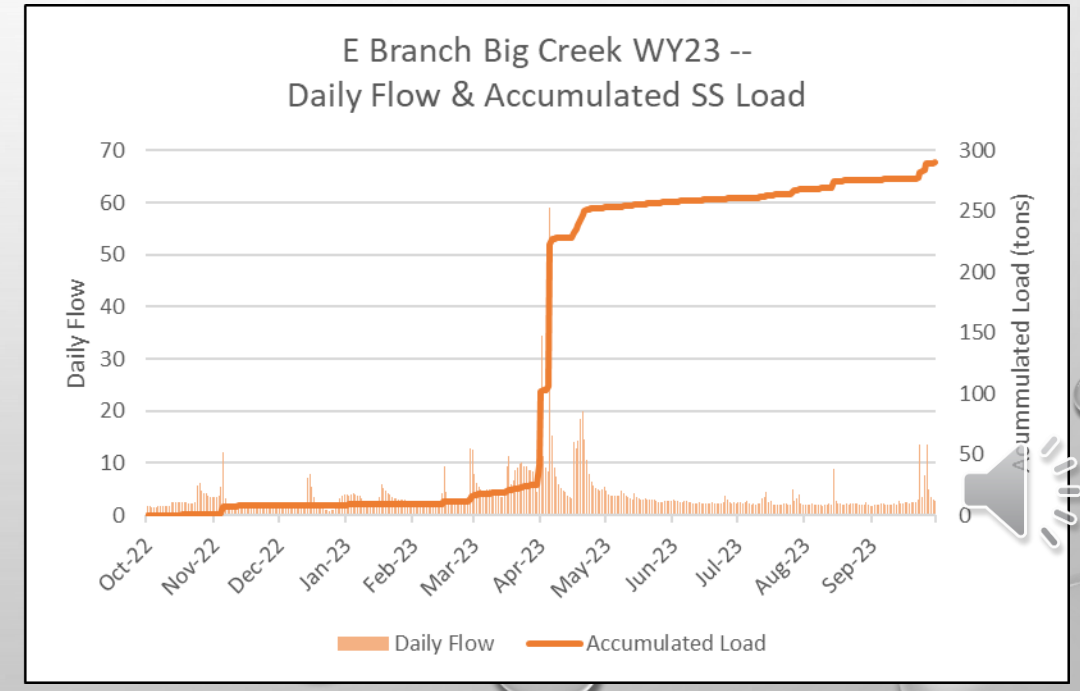




MEASURED WY23 SS LOADS

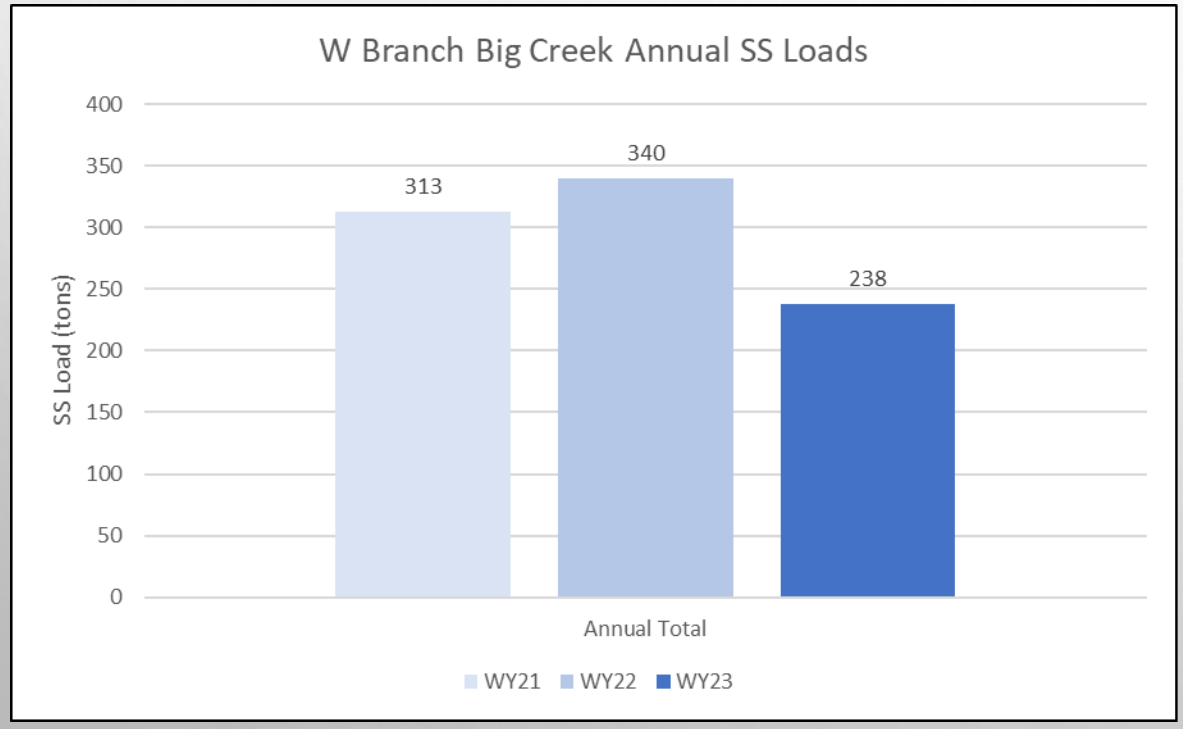
- WY23 Suspended Sediment Load Measured: E Branch Big Creek> W Branch Big Creek > LR Outlet
- W Branch Big Creek & E Branch Big Creek:
  - Majority of load measured during storm events when flows and concentrations are higher
- Outlet: Not collecting SS samples since 2021 – most concentrations < detect limit (settles out before outlet)

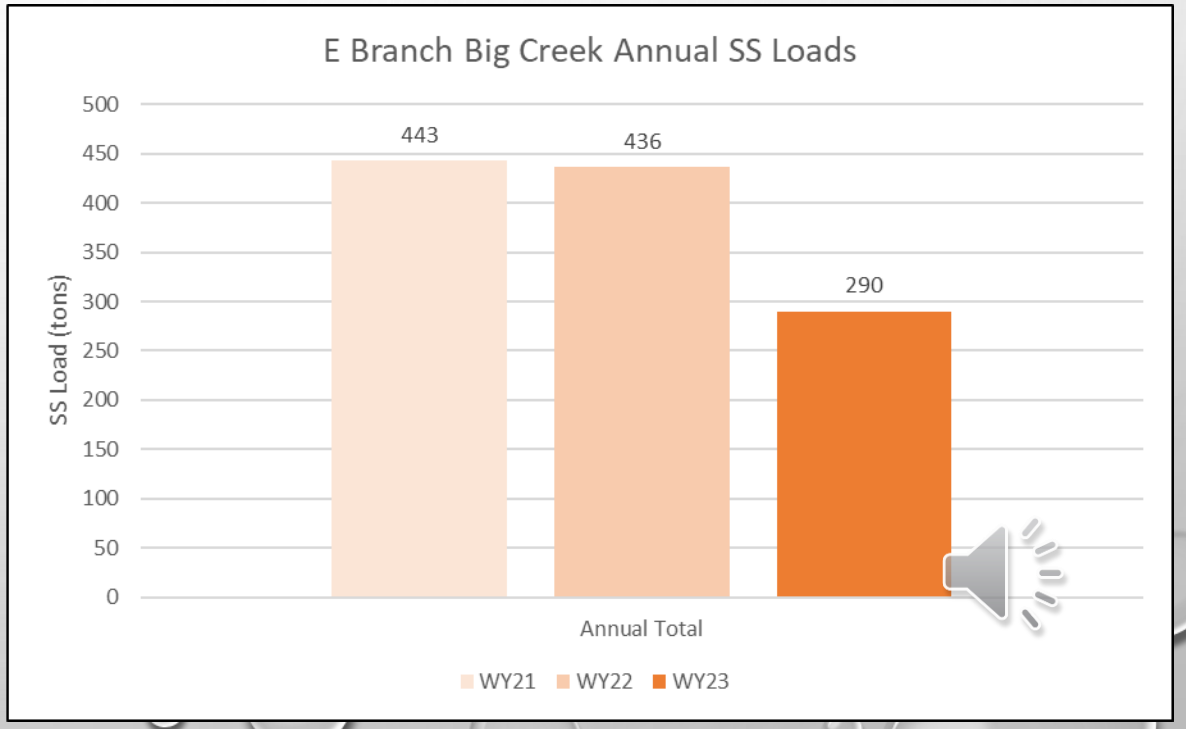




REDUCED SS LOADS IN WY23

- W Br Big Creek: WY22 → WY23 = -102 tons
- E Br Big Creek: WY22 → WY23 = -146 tons



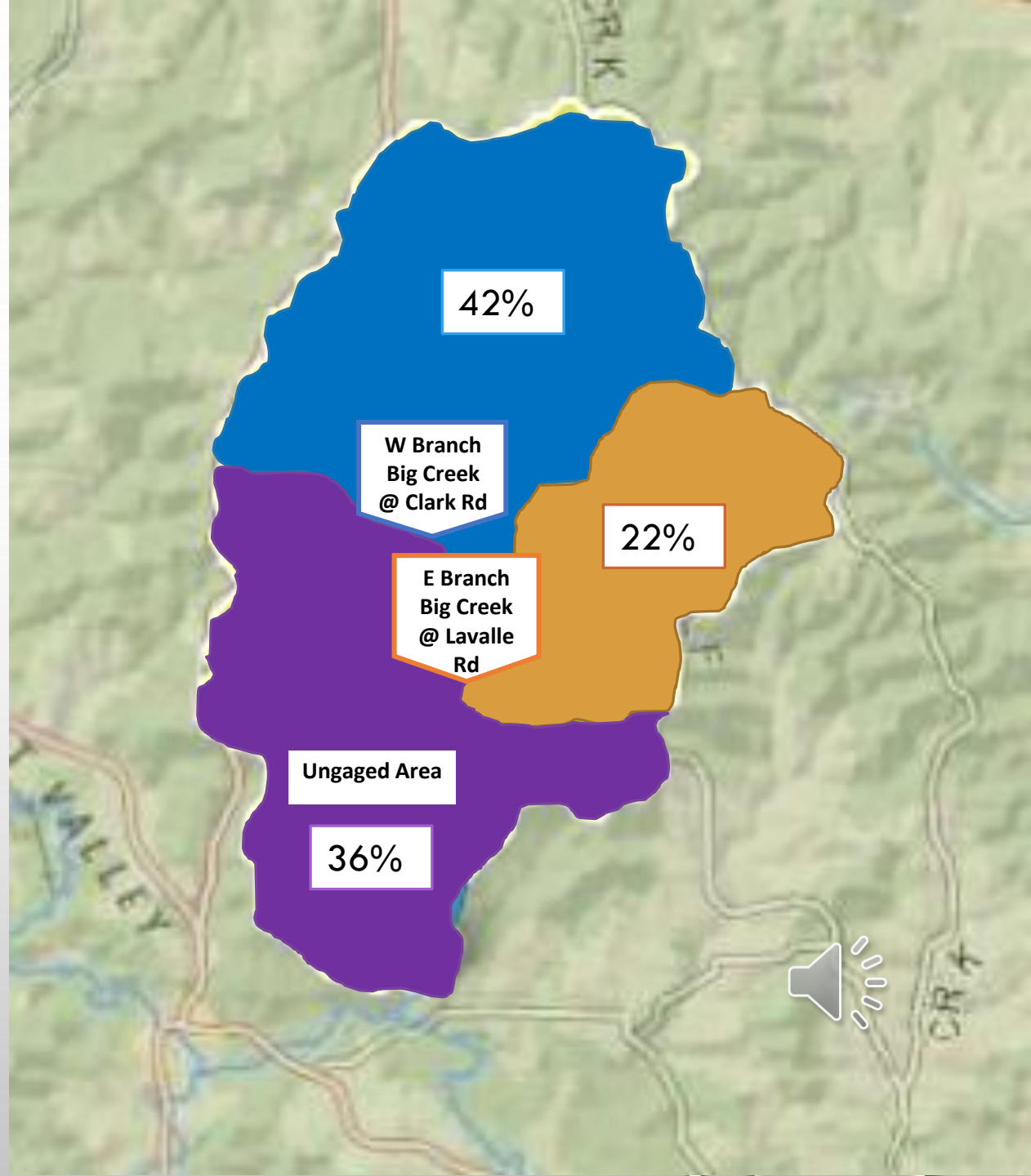


DELINEATED LAKE REDSTONE DRAINAGE AREA

W Branch Big Creek @ Clark Rd = 12 mi^2 = 42%

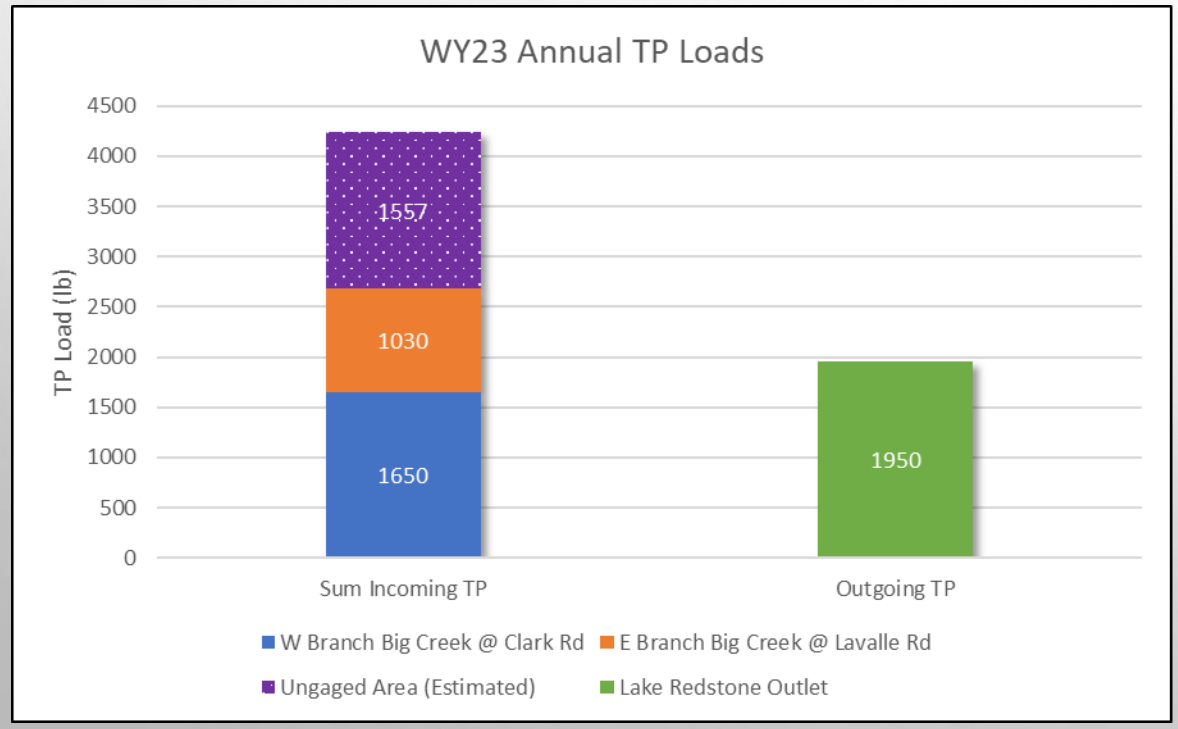
E Branch Big Creek @ Lavalle Rd= 6.38 mi^2 = 22%

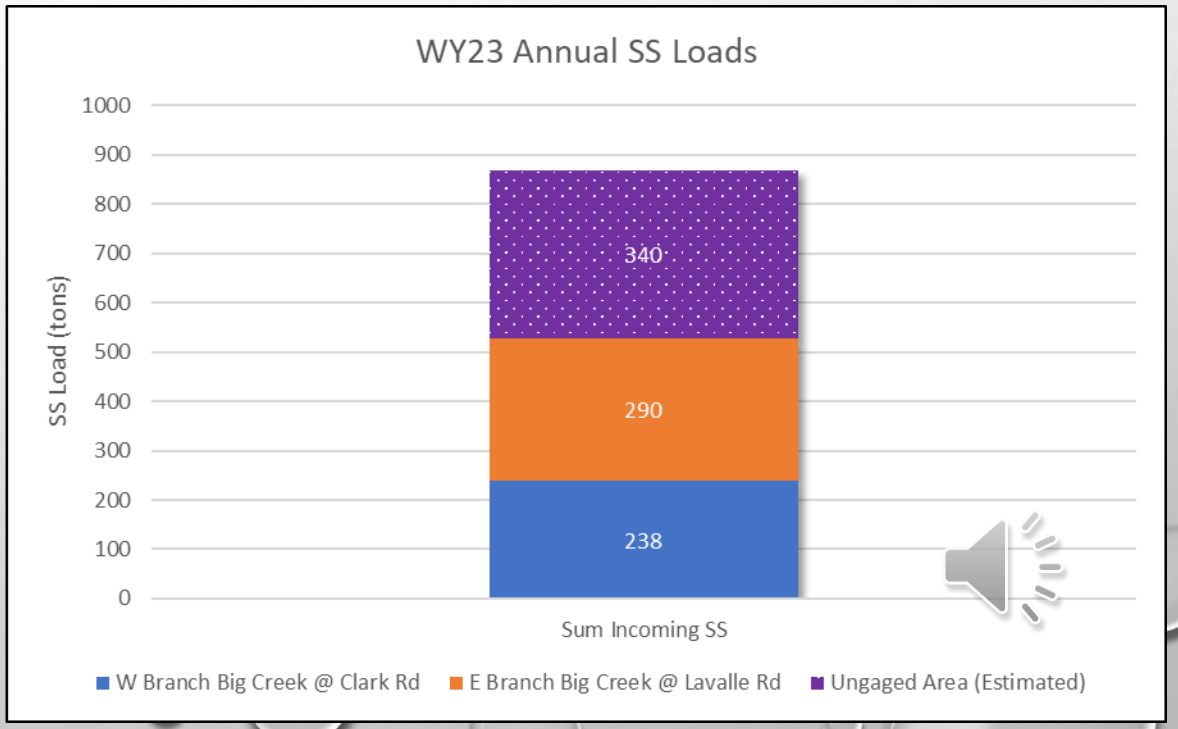
Ungaged Area = 10.42 mi^2 = 36%



ESTIMATED UNGAGED WY23 LOADS

- ***Estimated*** Unaged TP Delivered = Avg Inlet TP lb delivered per cfs X Ungaged Flow = 1560 lb
- ***Estimated*** Unaged SS Delivered = Avg Inlet SS ton delivered per cfs X Ungaged Flow = 340 tons





FINAL THOUGHTS

<u>WY23 Summary:</u>

- Less precip led to less flow (compared to WY21 & WY22)
- Less flow and lower event concentrations led to less TP and SS load
- We now have three years of flow + loading data at the three sites
  - good baseline of data that helps understand when/where/how much load is traveling through these streams
- Don't know as much about the ungagged areas – so far, we have only been able to make rough estimates

<u>Next Steps:</u>

- In WY24, we are changing our monitoring approach to collect data on some ungagged areas
  - Now collecting data at Eagle, Swallow, Martin-Meadow Bays
  - Continuing to monitor W Branch Big Creek & Outlet
  - Discontinuing the E Branch Big Creek monitoring station