

AADF – CJ Strike HW Weighting Storage Calculation Analysis

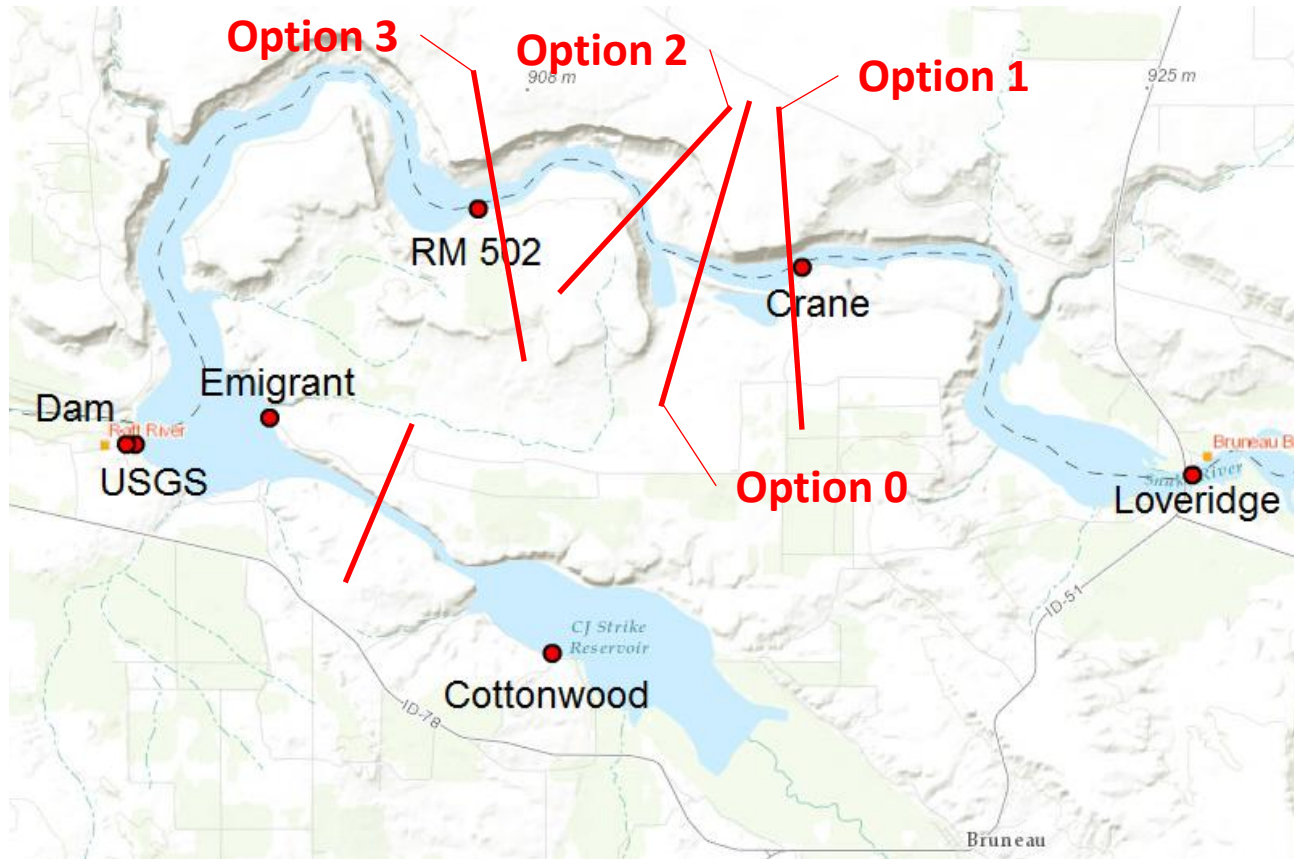


**Swan Falls Technical Working
Group Meeting 12/01/2015**

Action items from previous TWG

- Investigate additional analyses for Method 2 (storage by arm)
 - Use temporary headwater gages (between Loveridge and main reservoir) to refine breakpoint between gages
 - Select several breakpoint locations and compare performance to identify optimal assignment of influence area for each gage
- Investigate additional analyses for Method 1 (HW weighting)
 - Different time steps (weekly, daily, hourly) for optimization
 - Different weighting factors for wind vs. non-wind events
 - Compare storage changes to observed outflow for validation of optimal weighting (target winter months)

Storage by Arm Options

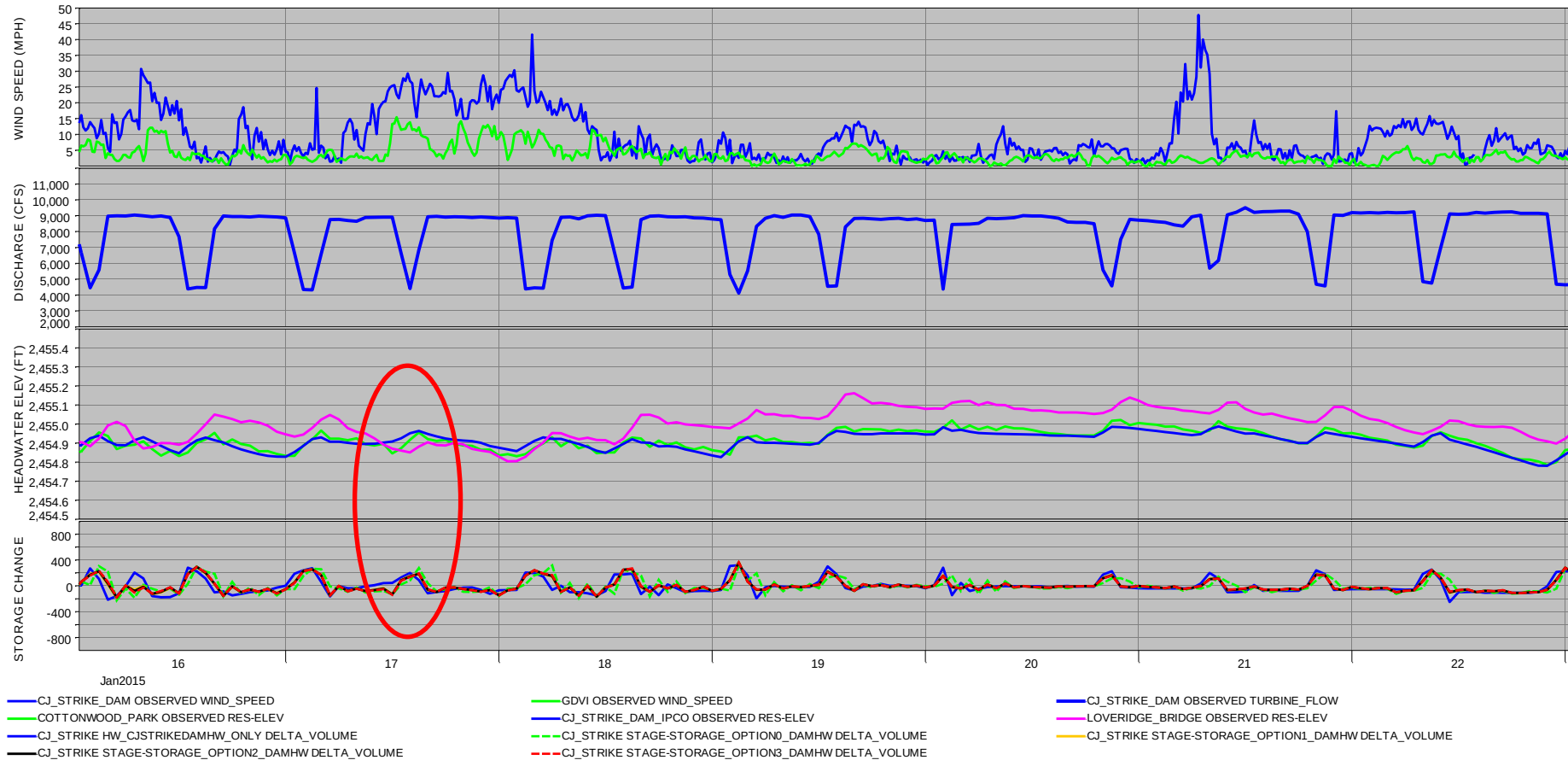




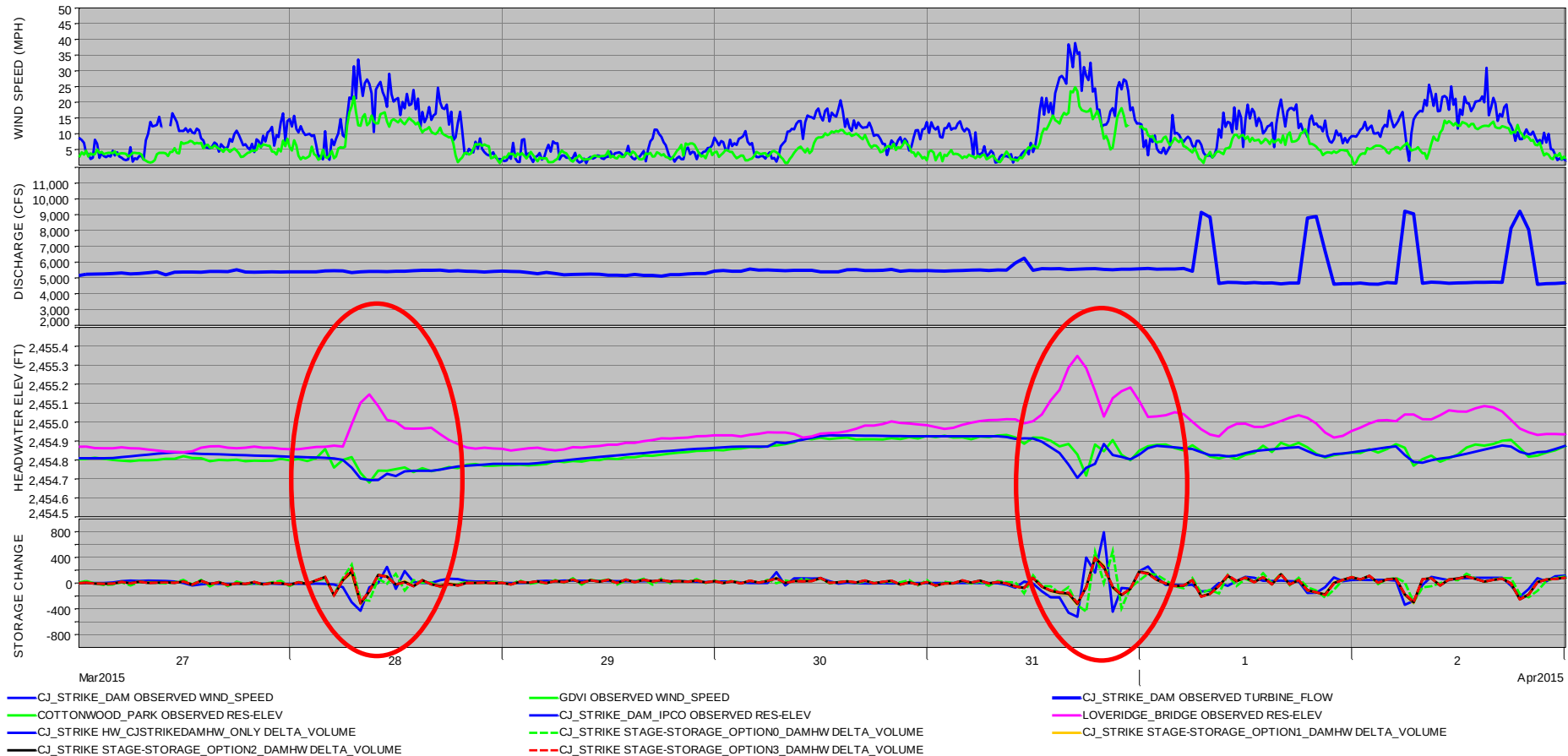
Surface Area and Volume

	Option 0	Option 1	Option 2	Option 3	Average
Surface Area					
Loveridge Arm Surface Area (%)	31%	29%	32%	35%	32%
Dam Arm Surface Area (%)	42%	44%	41%	38%	27%
Bruneau Arm Surface Area (%)	27%	27%	27%	27%	41%
Volume					
Loveridge Arm Volume (%)	10%	9%	11%	15%	11%
Dam Arm Volume (%)	71%	73%	70%	66%	70%
Bruneau Arm Volume (%)	19%	19%	19%	19%	19%

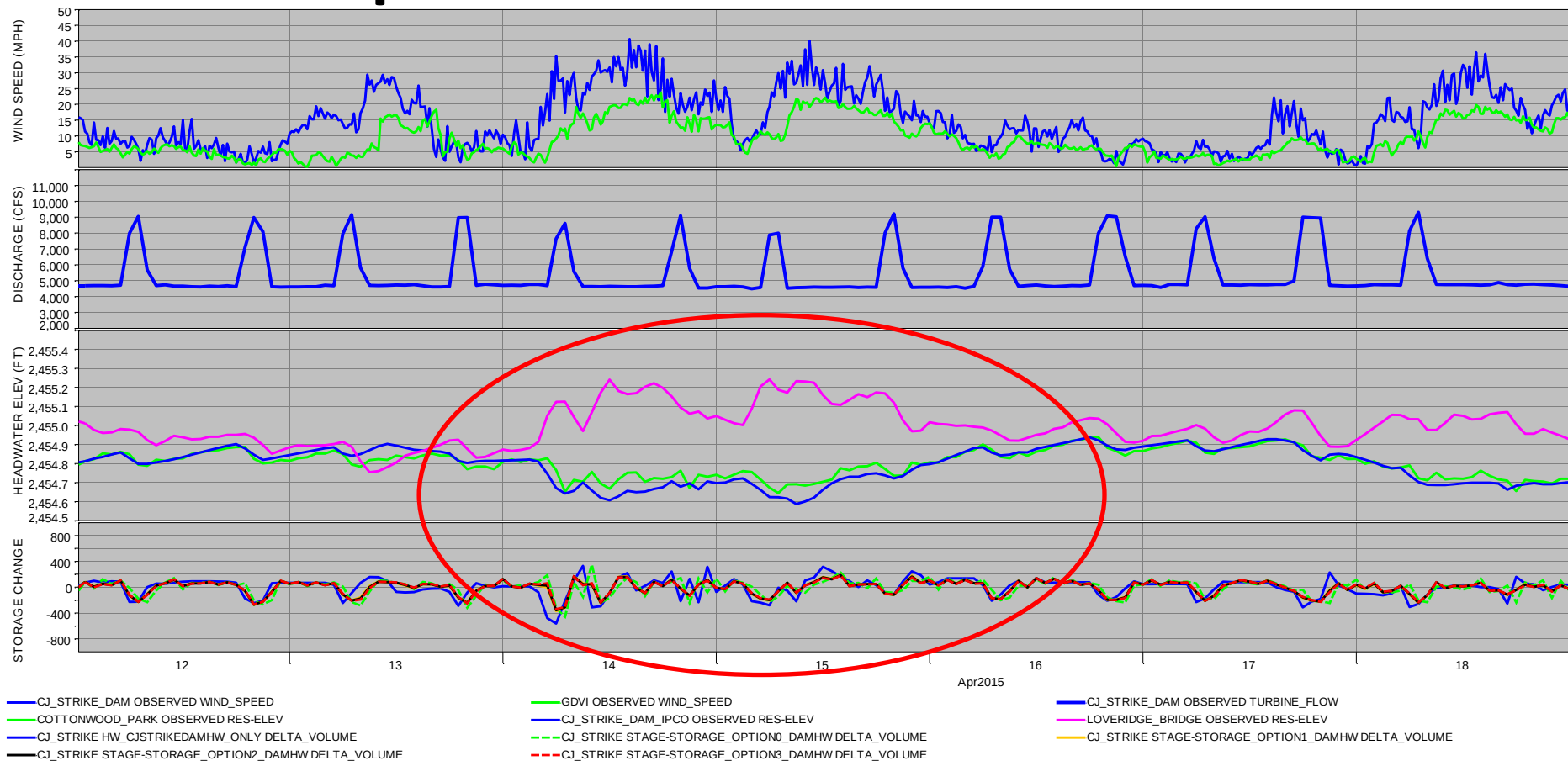
Results – Jan 16-22



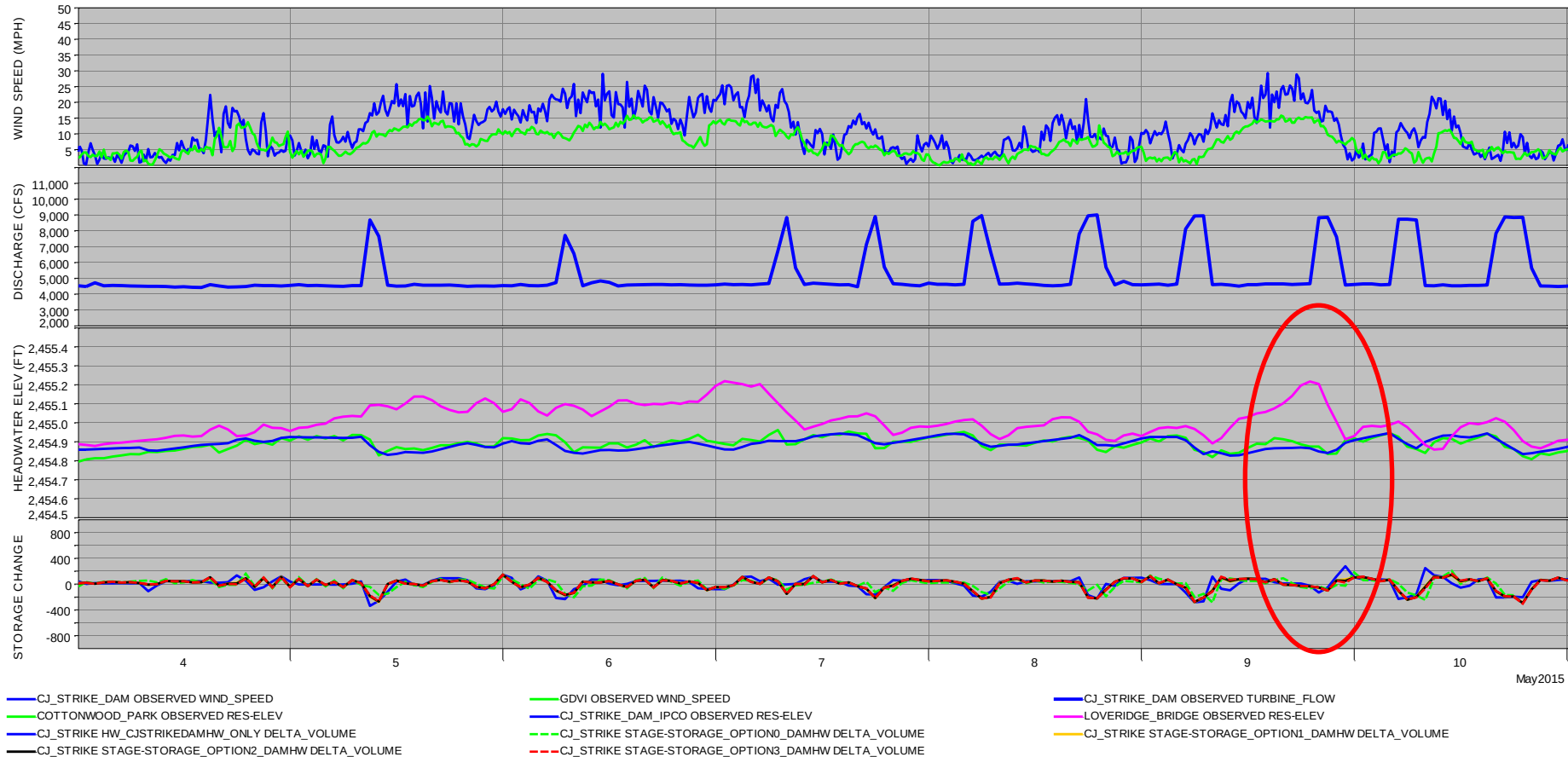
Results – Mar 27 – Apr 2



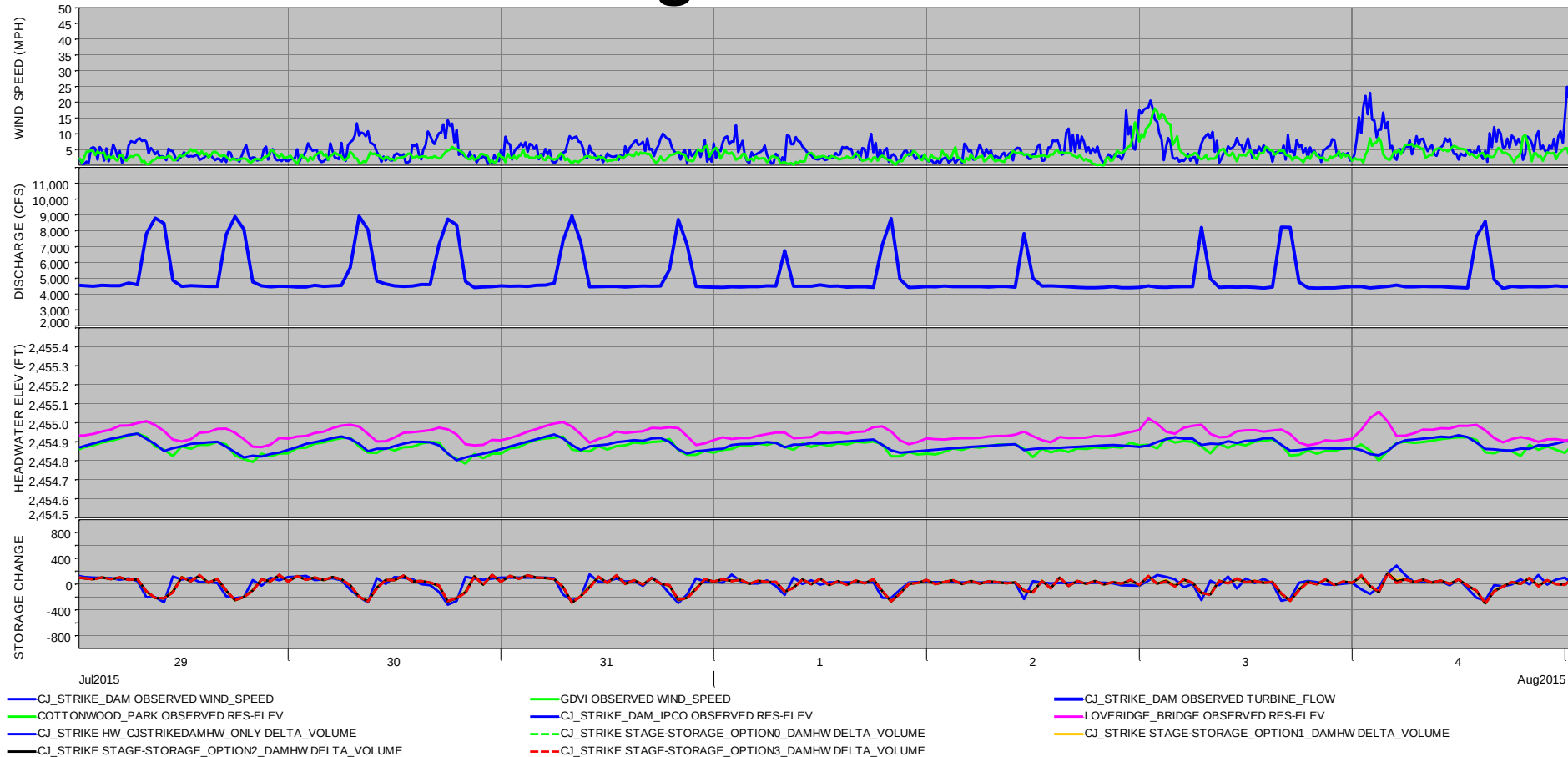
Results – Apr 12-18



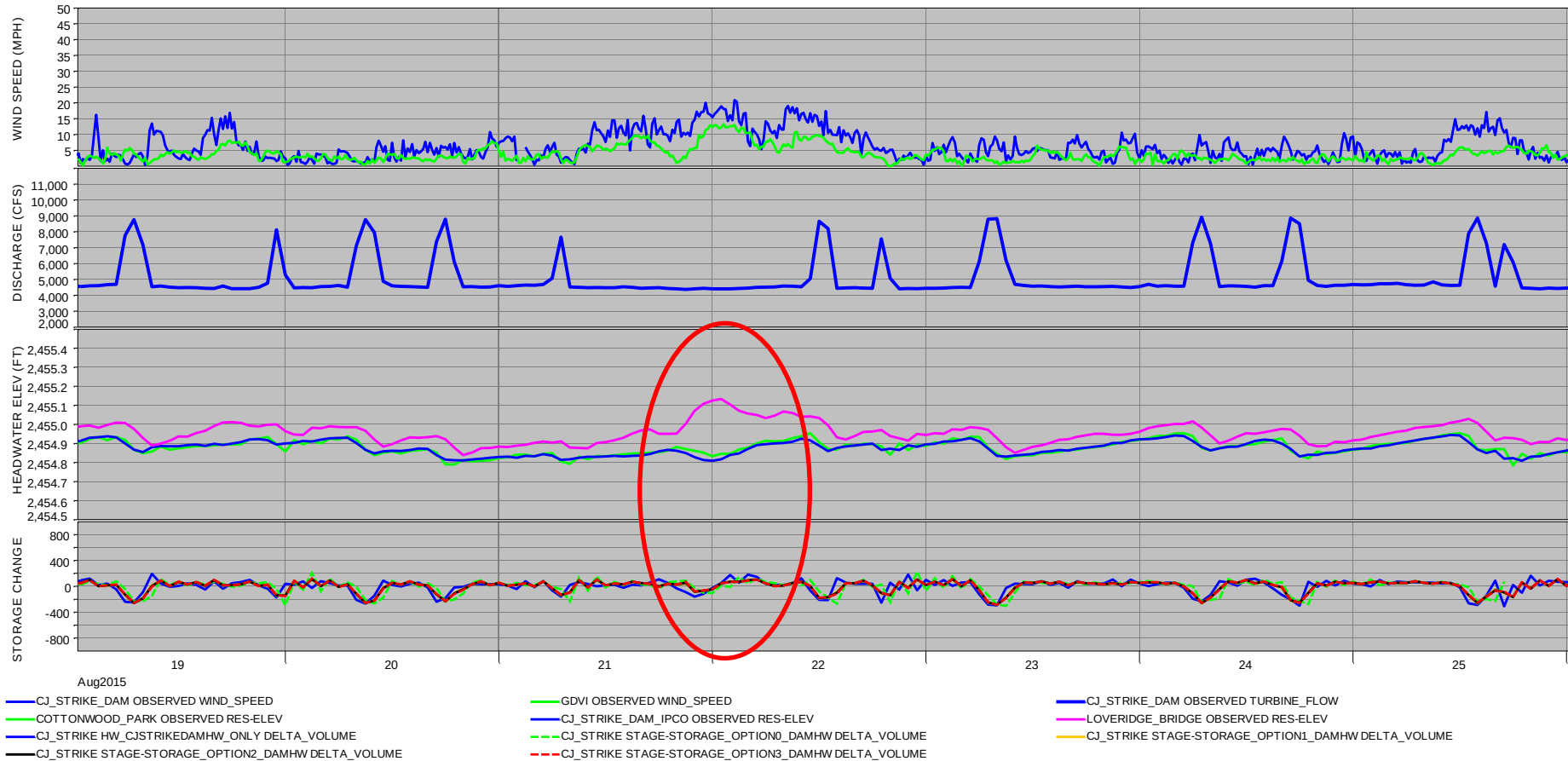
Results – May 4-10



Results – Jul 29 – Aug 4



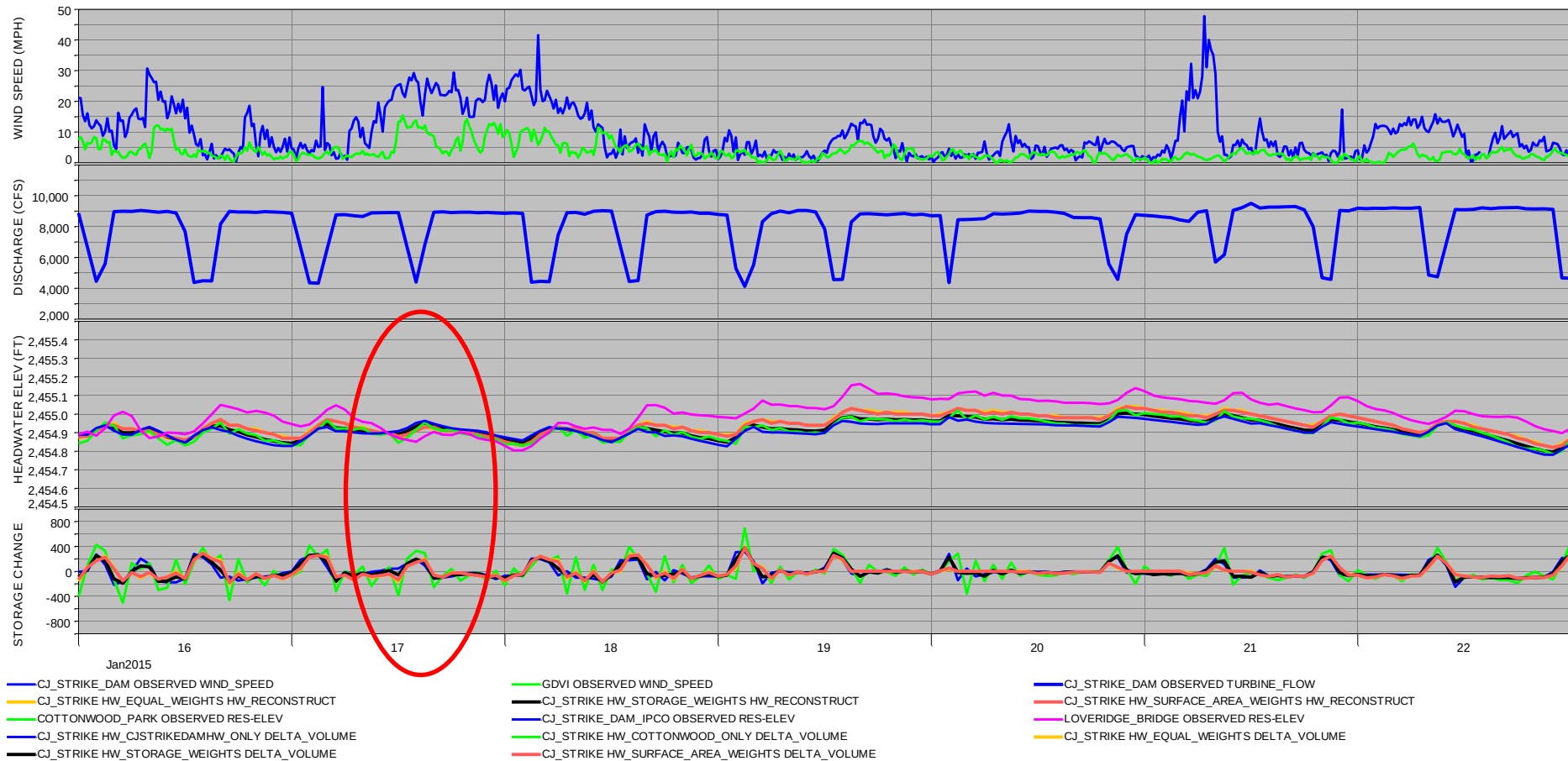
Results – Aug 19-25



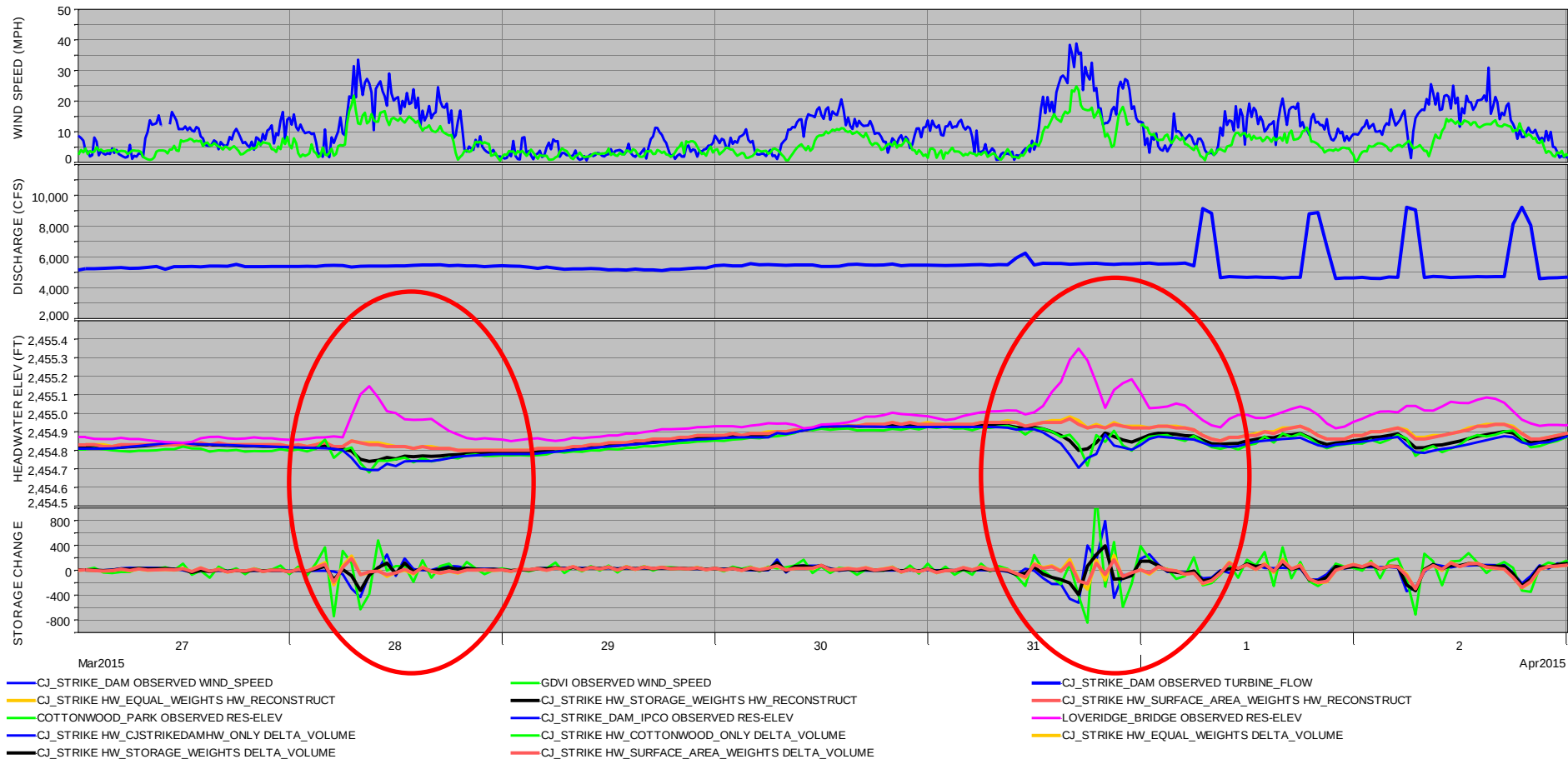
HW Weighting

- Optimization by day, week, month
 - Solver solutions unstable – not reliable over all time periods
- Wind vs. Non-wind events
 - Solver unstable
- Weighting by surface area
- Weighting by volume
- Equal Weighting
- Cottonwood Park HW only – based on visual observation

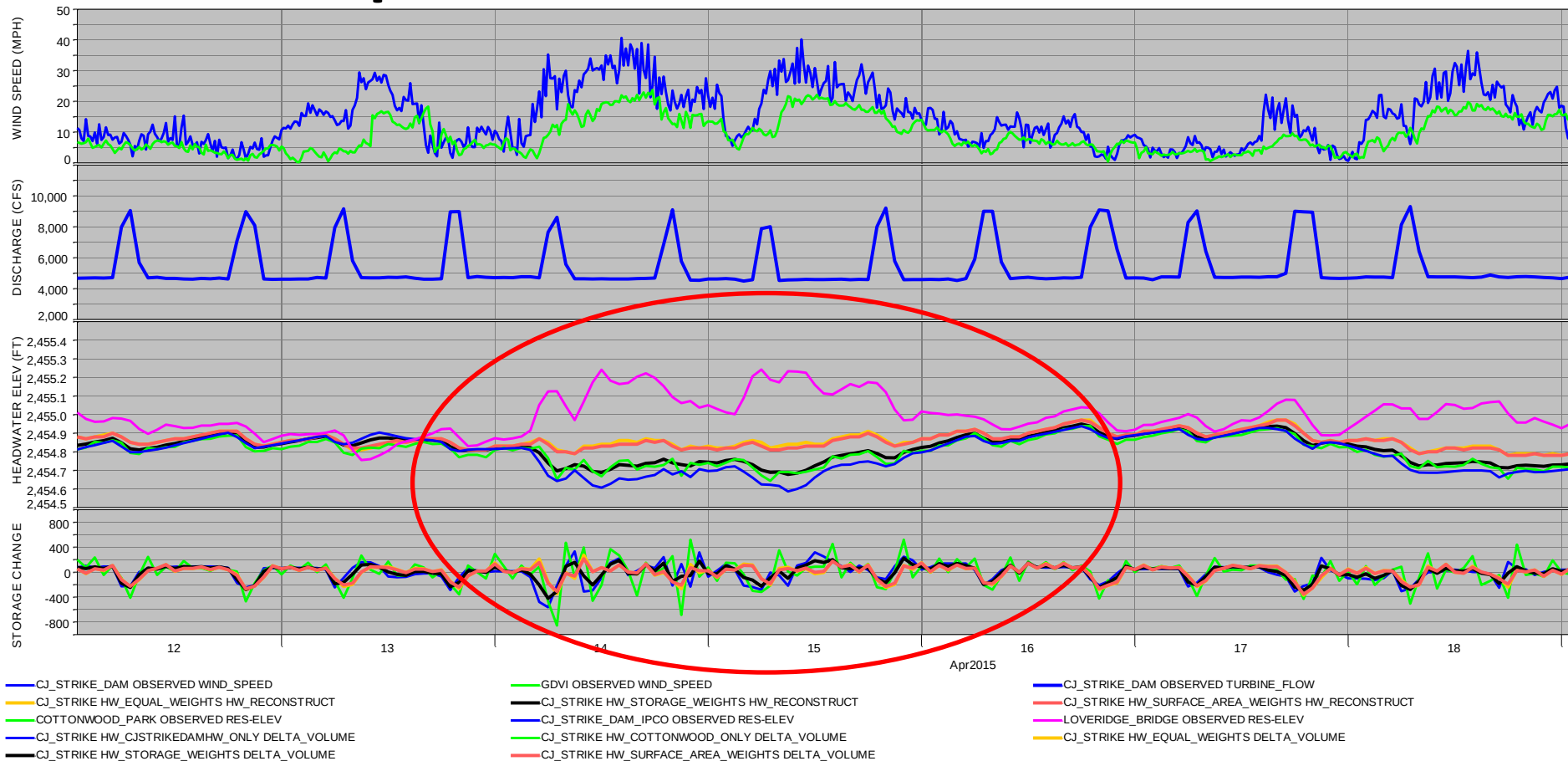
Results – Jan 16-22



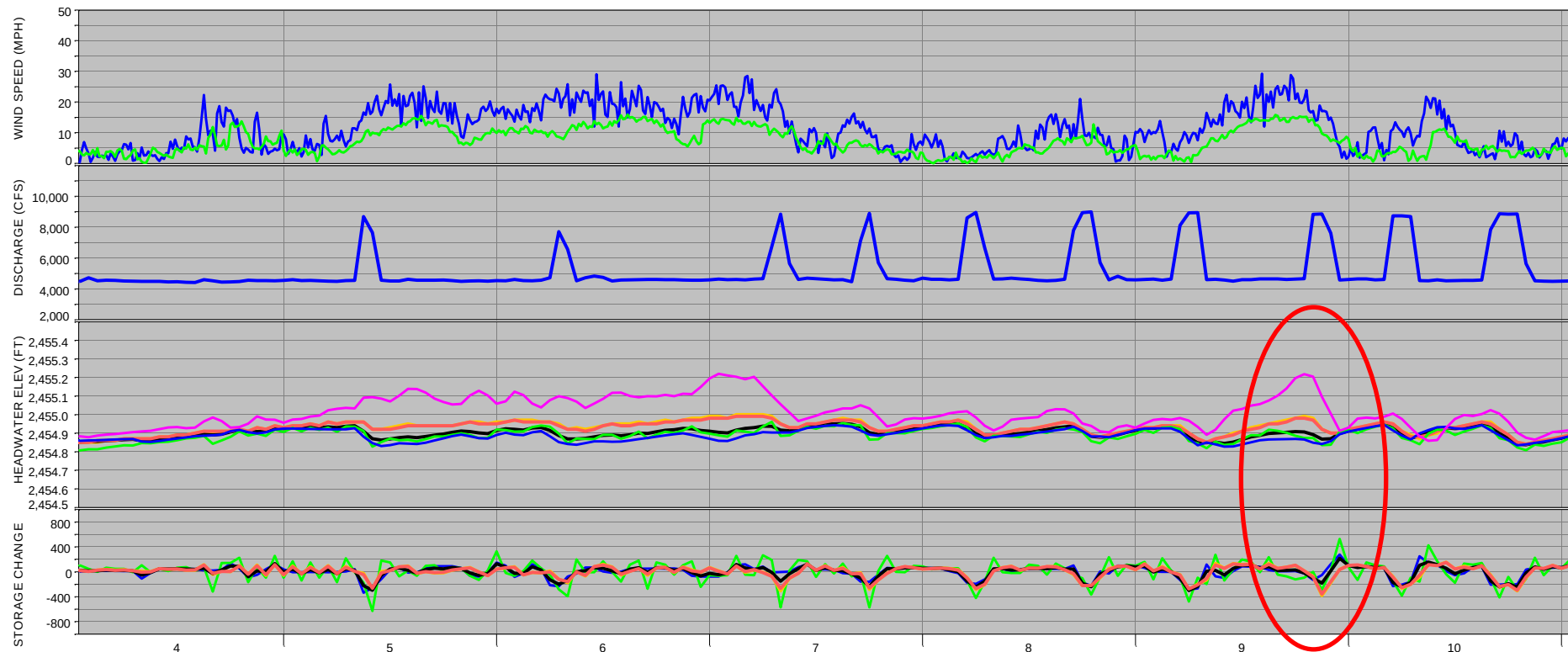
Results – Mar 27 – Apr 2



Results – Apr 12-18



Results – May 4-10



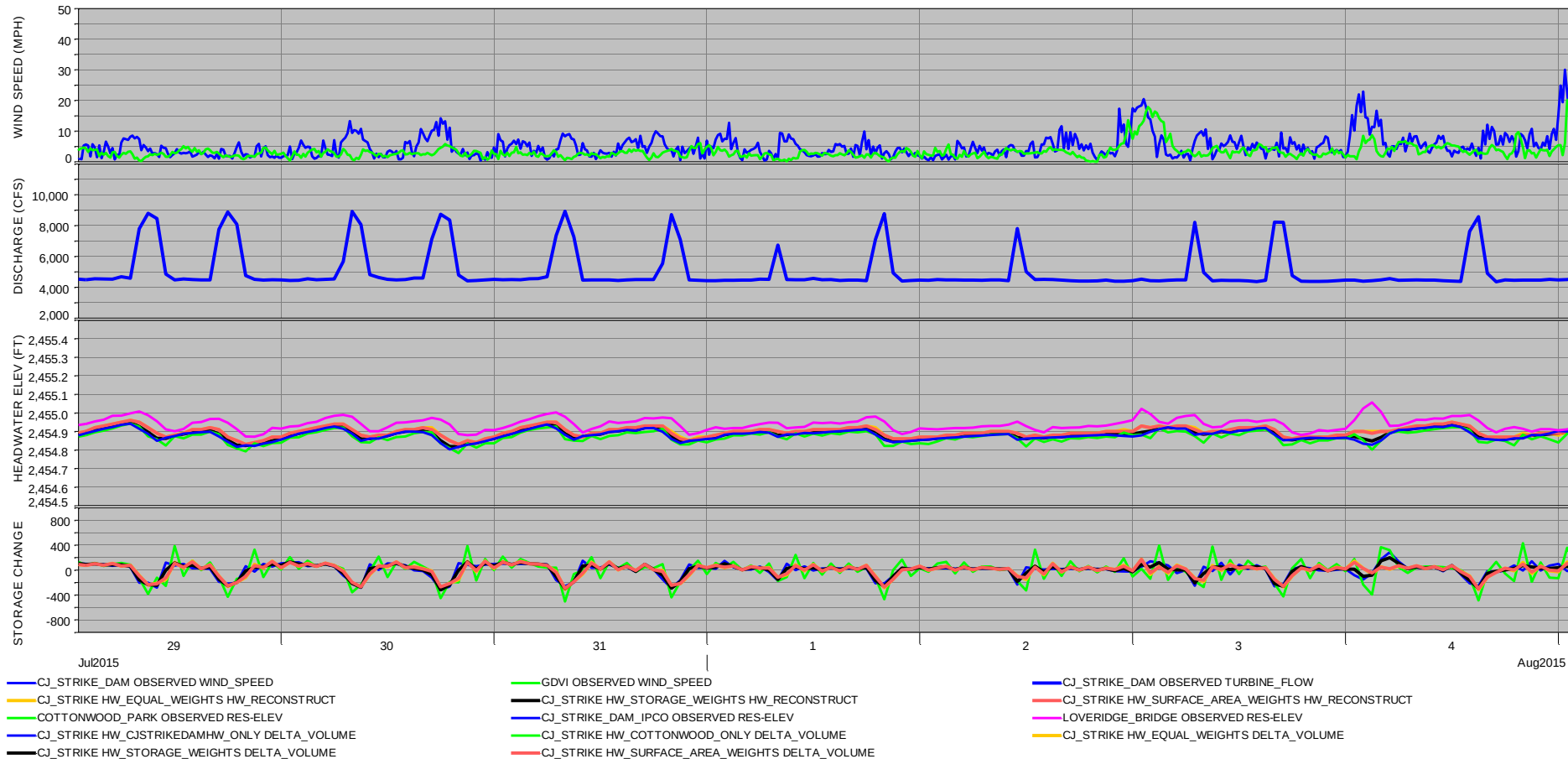
— CJ_STRIKE_DAM OBSERVED WIND_SPEED
 — CJ_STRIKE HW_EQUAL_WEIGHTS HW_RECONSTRUCT
 — COTTONWOOD_PARK OBSERVED RES-ELEV
 — CJ_STRIKE HW_CJSTRIKEDAMHW_ONLY DELTA_VOLUME
 — CJ_STRIKE HW_STORAGE_WEIGHTS DELTA_VOLUME

— GDVI OBSERVED WIND_SPEED
 — CJ_STRIKE HW_STORAGE_WEIGHTS HW_RECONSTRUCT
 — CJ_STRIKE_DAM_IPCO OBSERVED RES-ELEV
 — CJ_STRIKE HW_COTTONWOOD_ONLY DELTA_VOLUME
 — CJ_STRIKE HW_SURFACE_AREA_WEIGHTS DELTA_VOLUME

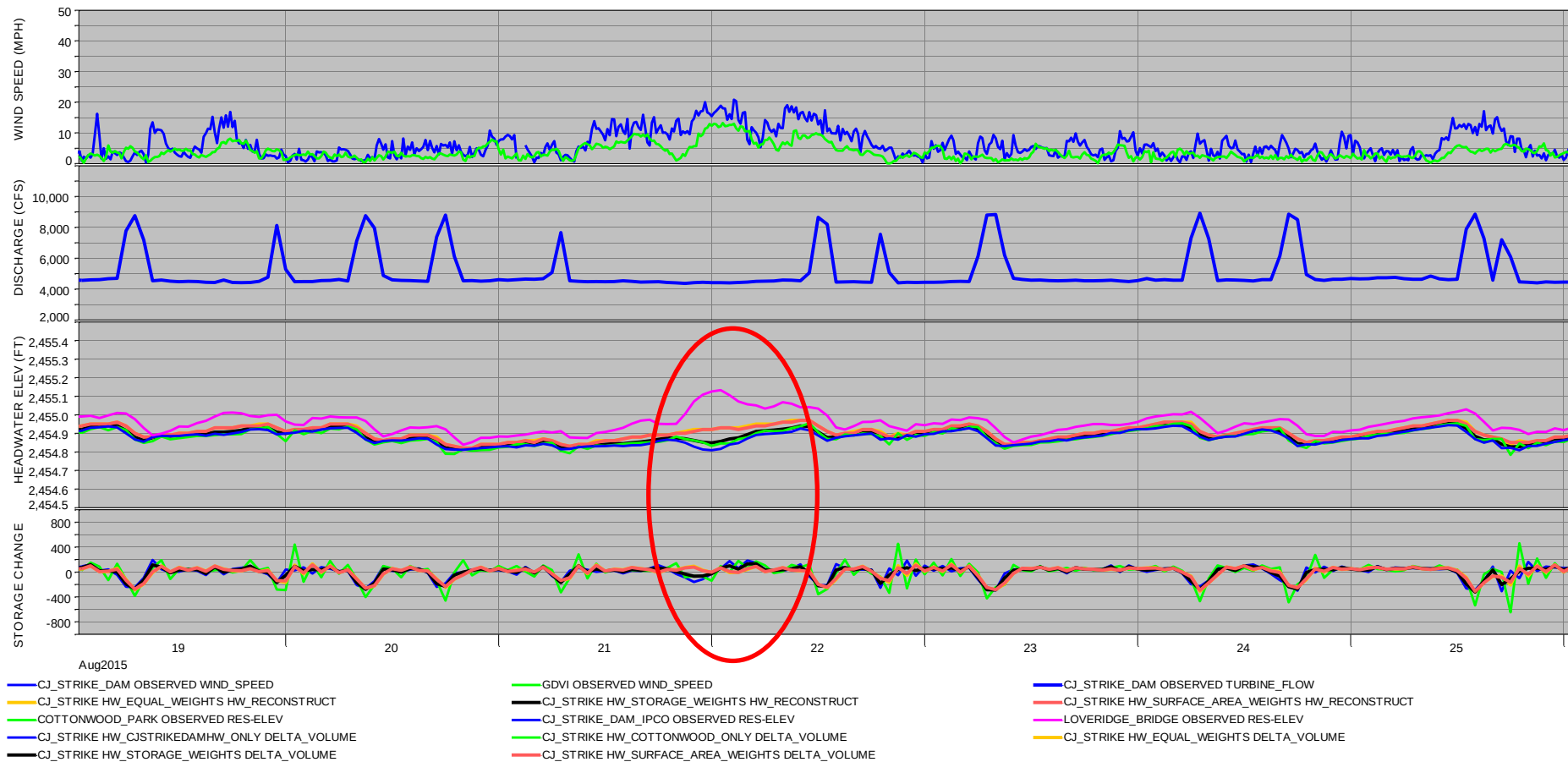
— CJ_STRIKE_DAM OBSERVED TURBINE_FLOW
 — CJ_STRIKE HW_SURFACE_AREA_WEIGHTS HW_RECONSTRUCT
 — LOVERIDGE_BRIDGE OBSERVED RES-ELEV
 — CJ_STRIKE HW_EQUAL_WEIGHTS DELTA_VOLUME

May 2015

Results – Jul 29 – Aug 4



Results – Aug 19-25



Summary

- Storage by arm (Method 2) tracks well during periods of no wind, but appears to have some issues if wind events are affecting HW readings (especially at Loveridge Bridge).
- Equal weighting or surface area weighting (Method 1 options) methods appear to work well during periods of no wind and high wind events. The HW composite and storage change values resulting from these methods approximate what is expected from the turbine flow data.