Los Angeles River Temperature Study

Technical Advisory Committee Meeting #4



August 19, 2025



Background



Los Angeles County Temperature Studies

- Revised temperature standard At no time shall these WARM-designated waters be raised above 80°F as a result of the waste
- Revised standards apply to WRP discharge in all watersheds in Los Angeles County
 - San Gabriel River and Santa Clara River (LA County Sanitation Districts)
 - LA River (Cities of Burbank and Los Angeles)
- Technical issues are similar between SGR, SCR, and LAR, but LAR is unique
- Focus for today's meeting is on the LA River and Burbank Western Channel

Two Main Elements of the Analysis

Element 1: Effects Determination

Magnitude of effect associated with WRP discharge

Element 2:
Management
Response / Assess
Control Measures

Review of Management Actions Being Evaluated/Modeled



If there are temperature effects... What do we want to do about it?



Evaluate potential control measures

management strategies inc. naturebased solutions

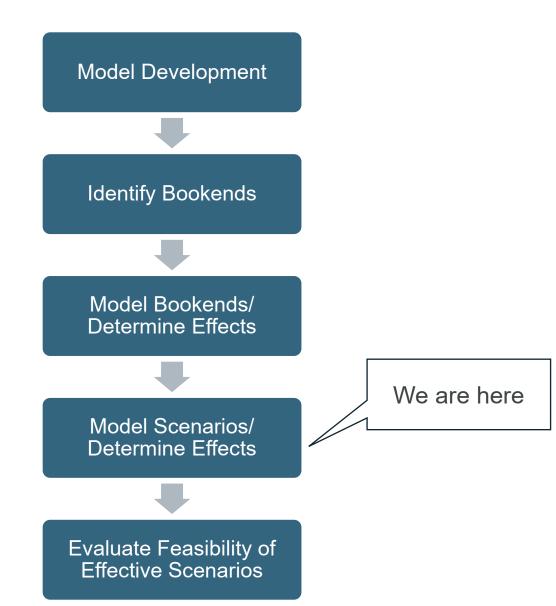


Evaluate future conditions based on management strategies

Using predictive tools to understand long-term impacts

Modeling Analysis Update

- Integrated Study temperature data into the HEC-RAS model
 - Calibrated and validated model
- Completed Preliminary Analysis
 - Actions/bookend control measures
 - Scenarios
 - Combinations of bookend control measures
 - Climate Change
- Evaluating results



Bookends for Scenarios



Reduction in effluent temperature Completed

Simulate reduction in effluent temperature to meet WQOs of 80°F and Δ5°F (e.g., 0-25%)

Summer (80°F) Vs winter (Δ 5°F)



Reduction in WRP discharge associated with increased recycling **Completed**Simulate reduction in effluent discharge volume (e.g., 0-50%)

Summer Vs winter



Increased canopy cover Completed

Simulate canopy cover (e.g., 0–100%)

Proximate to outfall Vs continuing downstream

Increase density and depth of in-channel pools



Significant channel modification necessary to facilitate pools

Unable to obtain USBR model for fish passage near downtown

No workflow path available given schedule

Modeling Analysis



Modeling Analysis







• Effluent temperature reduction





Shading



Potential combinations of actions for scenario analysis

- Effluent cooling + shading
- Effluent cooling + flow reduction
- Effluent cooling + flow reduction + shading



- Climate change
 - 30 years in future

We are here

• Reconvene to discuss bookend results and scenario analysis

Modeling Efforts – Preliminary Findings

| Analysis | Result 2 - 4 Miles Downstream of WRPs |
|---|--|
| Effluent Temperature Reduction | No Meaningful Change |
| Effluent Flow Reduction | No Meaningful Change |
| Shading | No Meaningful Change |
| Scenarios | |
| Effluent Temperature + Flow Reduction | No Meaningful Change |
| Effluent Temperature Reduction + Shading | No Meaningful Change |
| Effluent Temperature + Flow Reduction + Shading | No Meaningful Change |
| Future Baseline (Climate Change) | Increased Temperature |
| Future Temperature Control | No Meaningful Change from New Baseline |

Effluent Temperature Reduction

WRP effluent temperatures reduced to ensure limits are met:

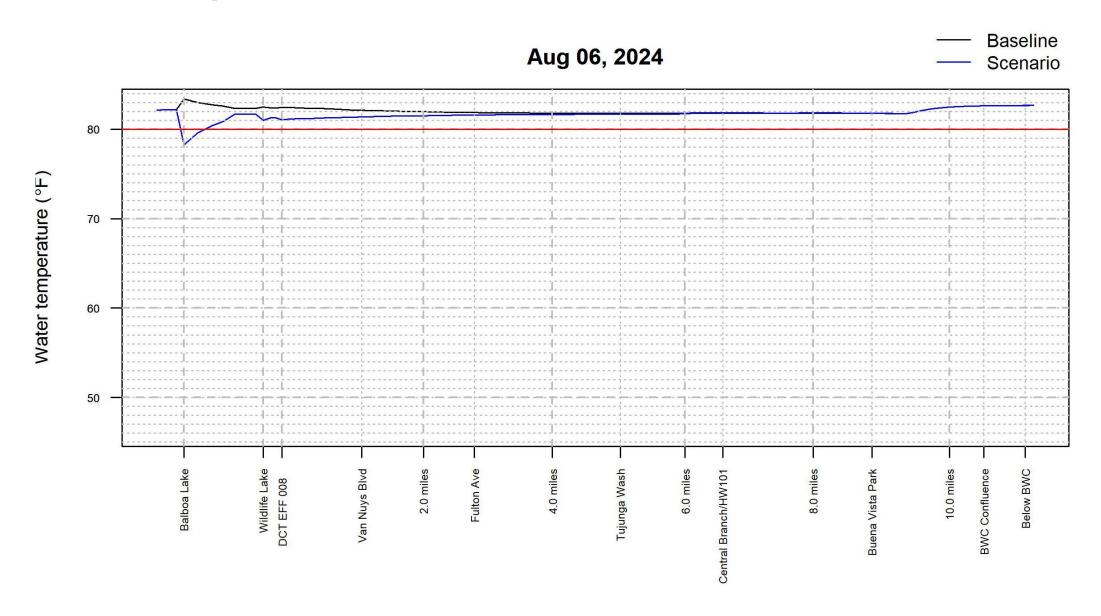
- Maximum 80 °F
- Maximum ∆5 °F between upstream and effluent

∆5°F primary driver of reductions needed

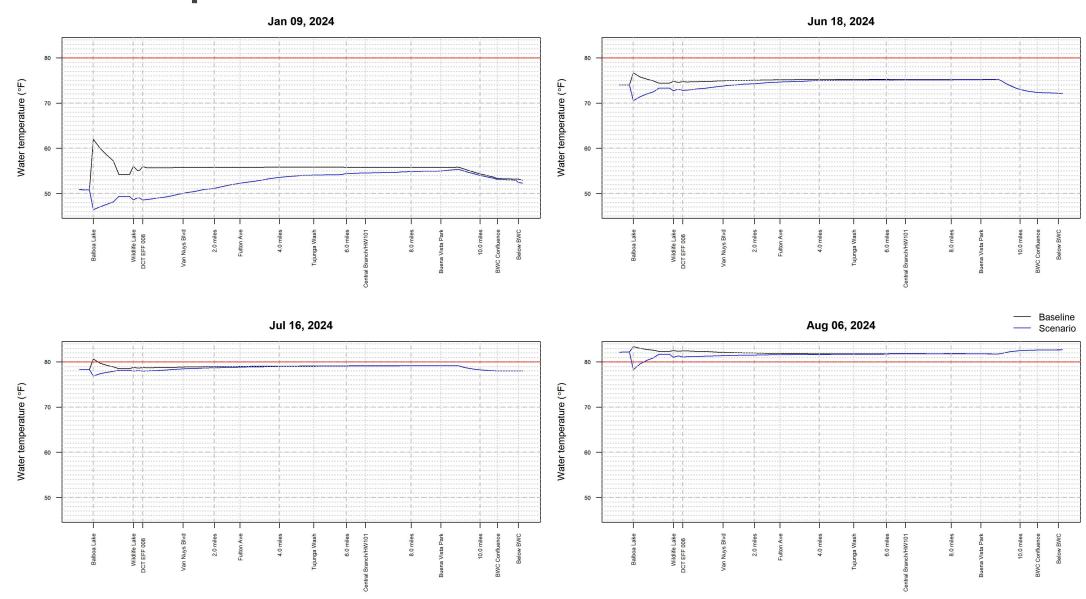
| Month | Temperature Reductions Needed to Attain WQOs (°F) | | | |
|-----------|---|-----------|-----------|--|
| Worth | DCT | LAG | BUR | |
| January | 29 | 29 | 33 | |
| February | 29 | 30 | <u>37</u> | |
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80°F drives reductions Δ 5°F drives reductions

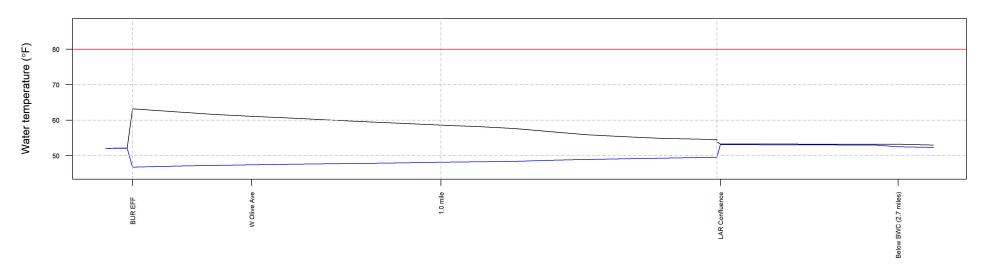
Effluent Temperature Reduction - DCT

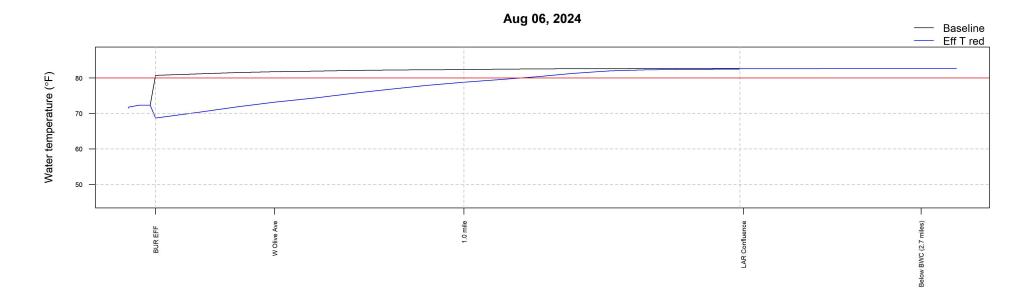


Effluent Temperature Reduction - DCT

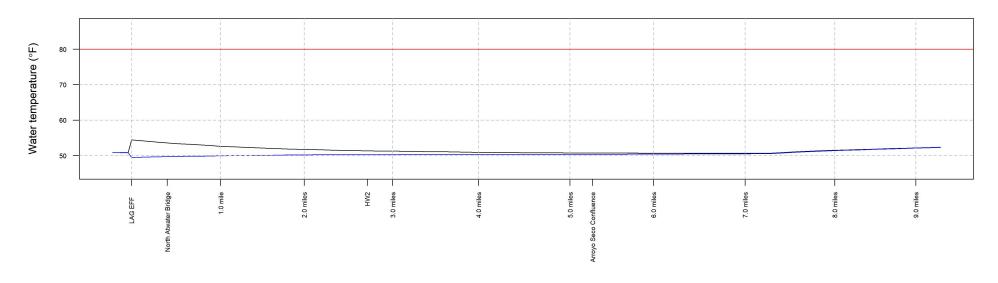


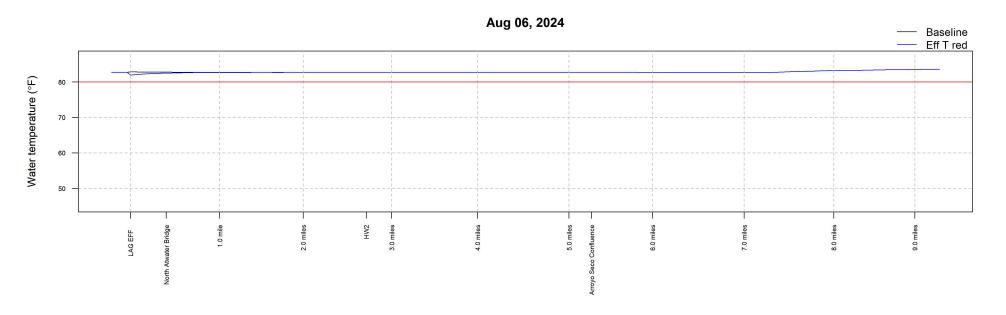
Effluent Temperature Reduction - BUR





Effluent Temperature Reduction - LAG





Effluent Flow Reduction

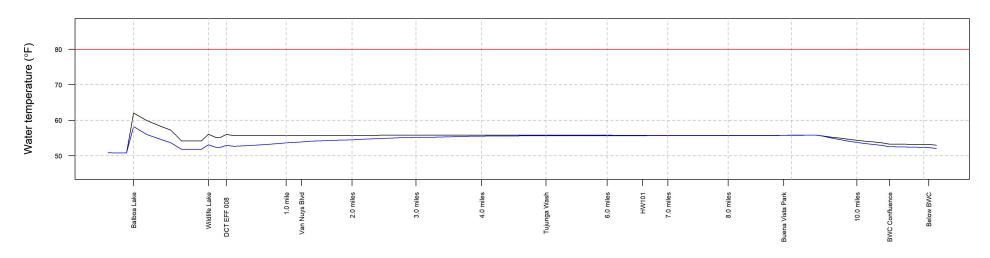
WRP discharge flowrate reduced to reflect increased recycle:

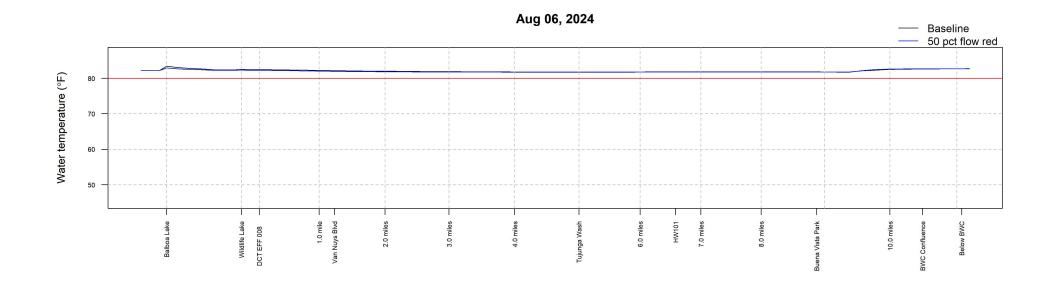
- Current flows 2017-2024 Annual Average Flowrate
- DCT Total Effluent

Bookend (50%) Reduced Discharge results displayed

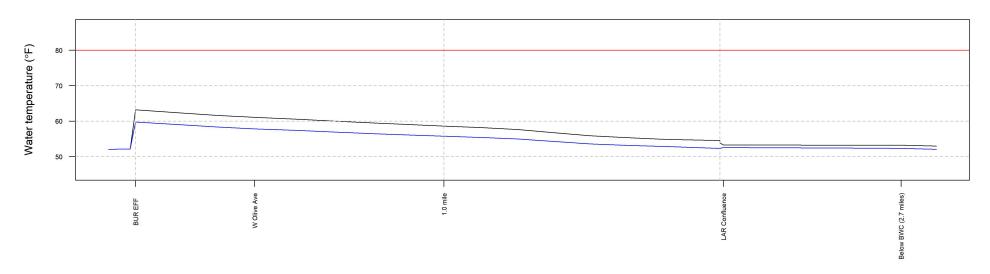
| | Effluent Flowrate (MGD) | | | | |
|-----|-------------------------|-----------|------|------|------|
| WRP | WRP | Reduction | | | |
| | | 5% | 10% | 25% | 50% |
| DCT | 21.6 | 20.5 | 19.4 | 16.2 | 10.8 |
| LAG | 8.5 | 8.1 | 7.7 | 6.4 | 4.3 |
| BUR | 3.0 | 2.9 | 2.7 | 2.3 | 1.5 |

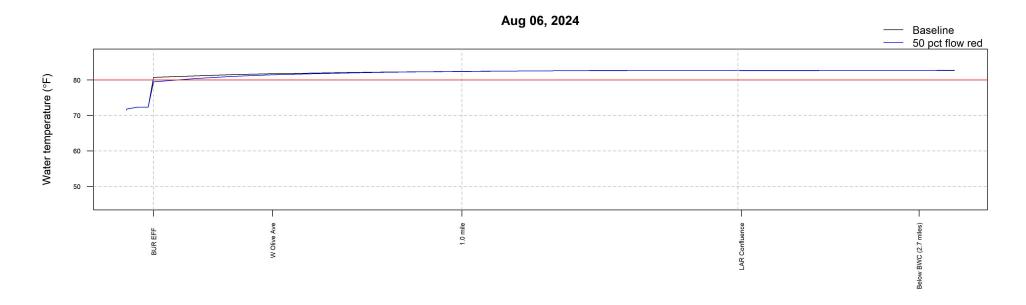
Effluent Flow 50% Reduction - DCT



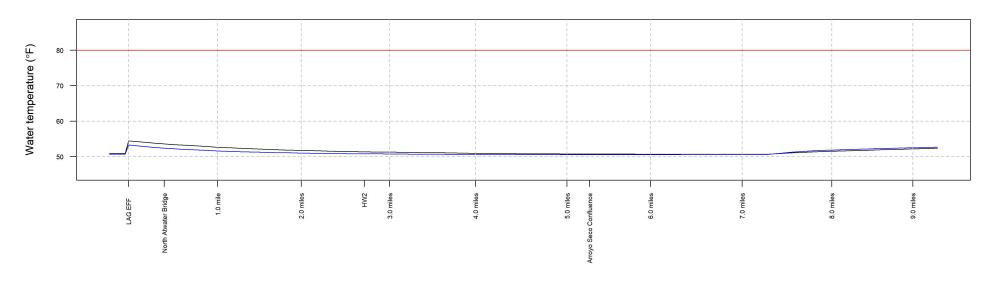


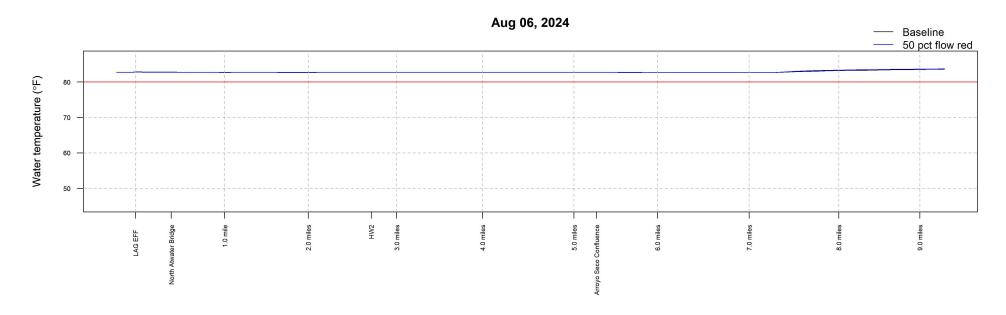
Effluent Flow 50% Reduction - BUR





Effluent Flow 50% Reduction - LAG





Shading

CQ088

North_Hollywood

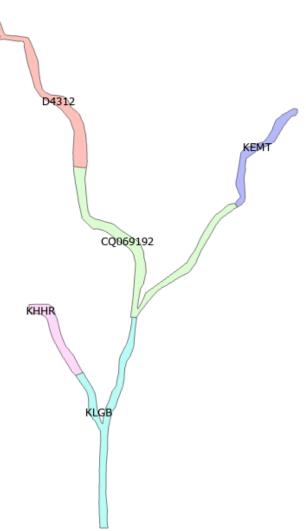
To represent 100% shading we assumed:

Simplifying assumption

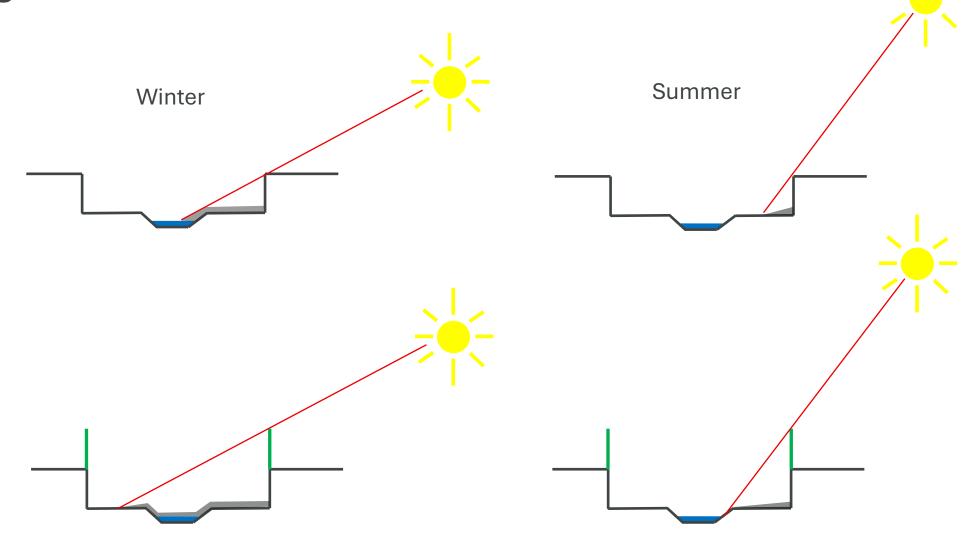
- Used 30-foot solid wall on top of channel walls
- Maximum shading
- If warranted, revise for tree type, spacing, etc.

GIS tools used to calculate shadows

- DEM for topography
- Digitized water in channel
- Sun position over day and time of year for shadow calculation
- Eight MET station coverages of river system



Shading



Shading

North_Hollywood

D4312

CQ069192

To represent 100% shading we assumed:

Simplifying assumption

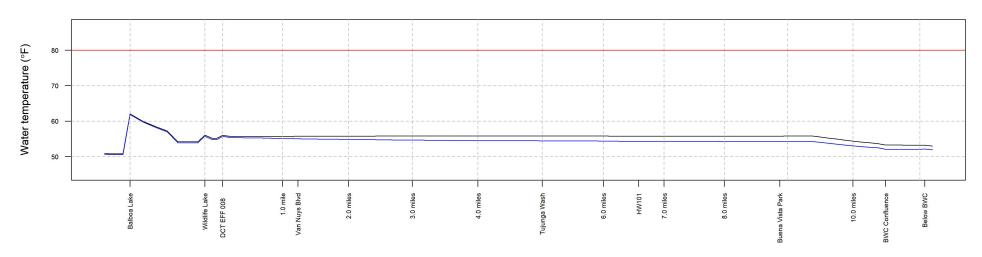
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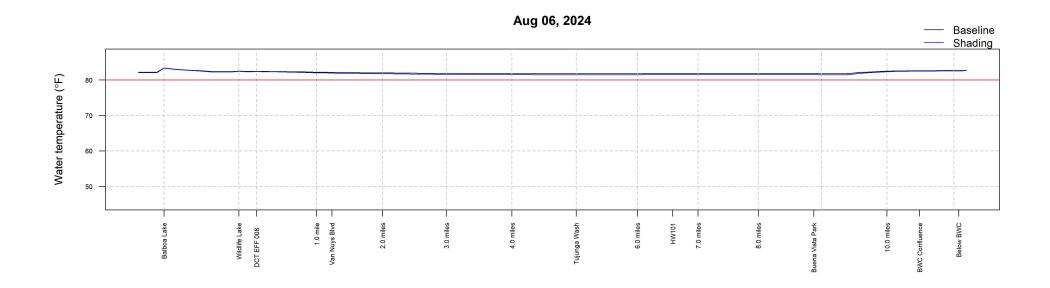
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100% Shading – DCT

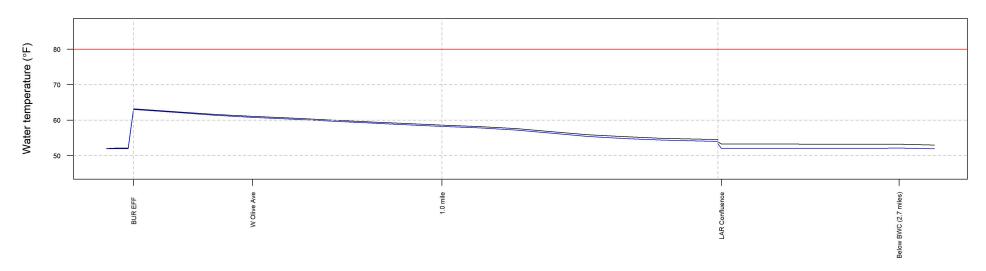


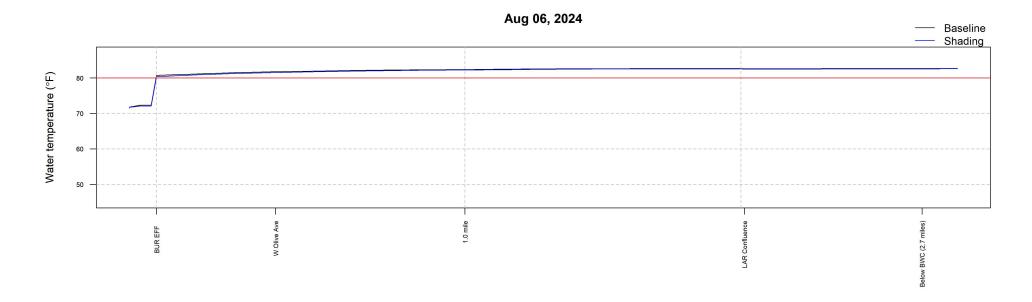




100% Shading - BUR

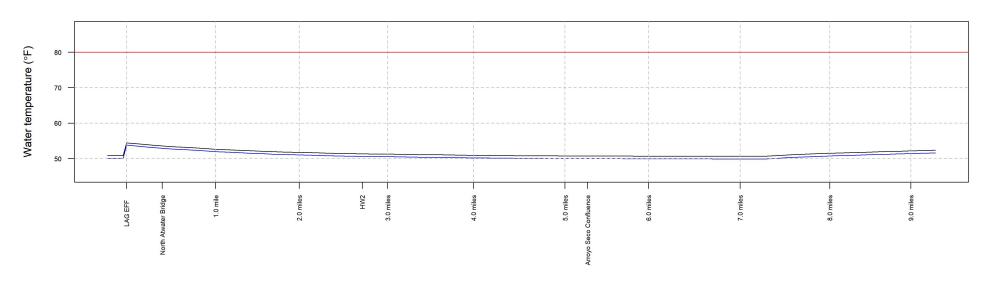


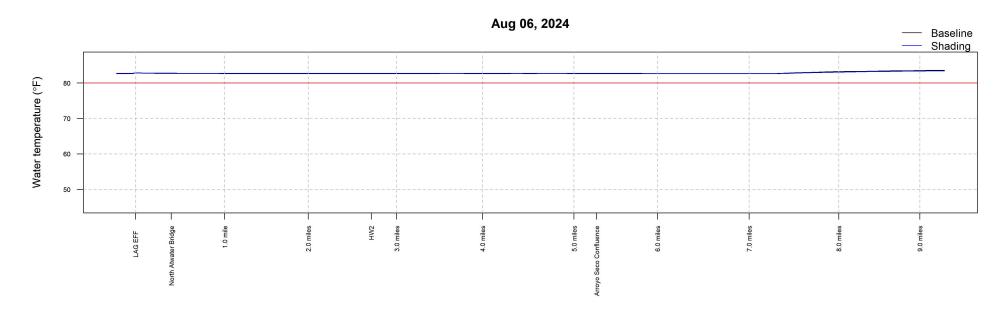




100% Shading - LAG







Scenarios



Scenario: Effluent Temperature and Flow Reduction

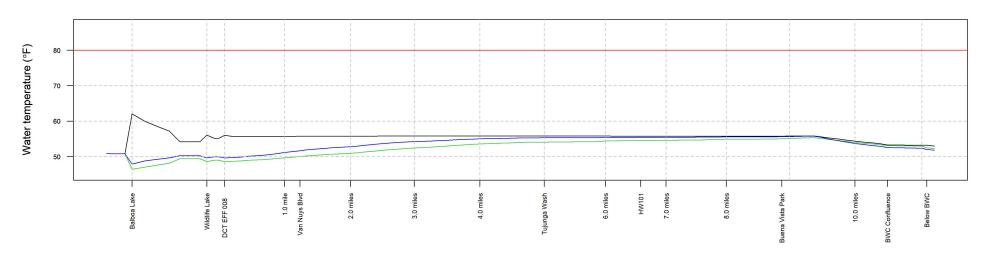
WRP effluent temperature reduced to ensure limits are met

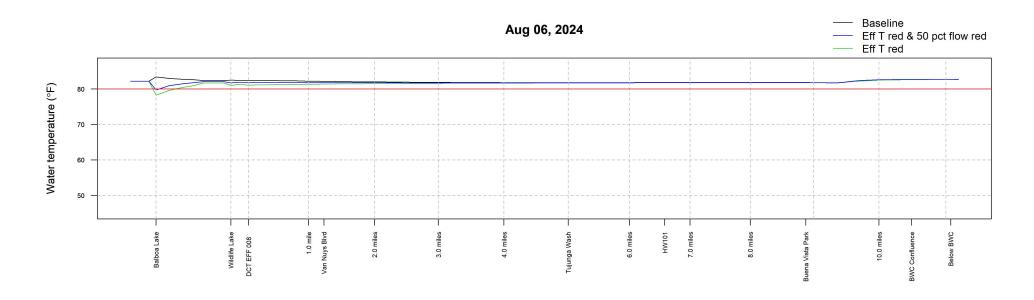
WRP effluent flows reduced (Bookend of 50% Reduced Discharge results displayed)

| Month | Temperature Reductions Needed to Attain WQOs (°F) | | | |
|-----------|---|-----------|-----------|--|
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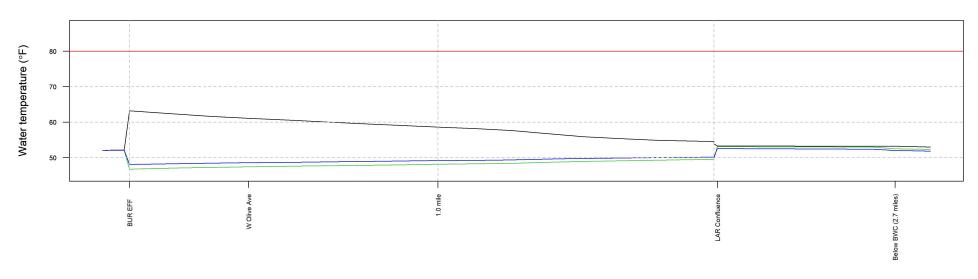
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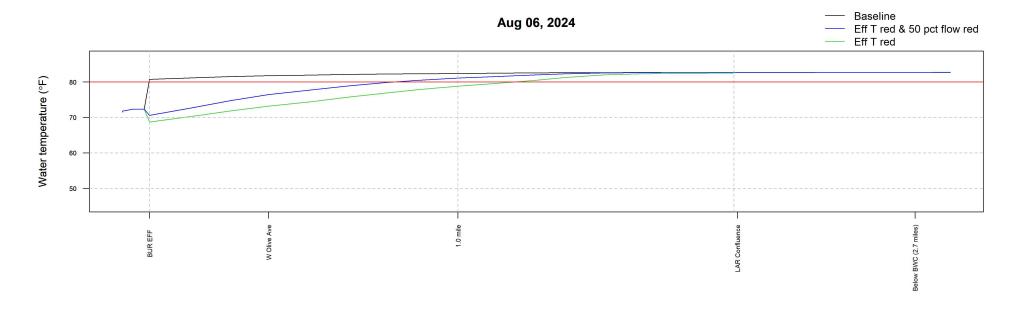
Scenario: Effluent Temperature + 50% Flow Reduction - DCT



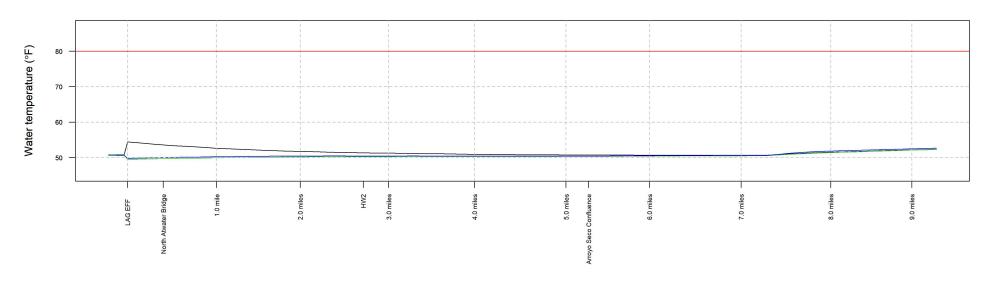


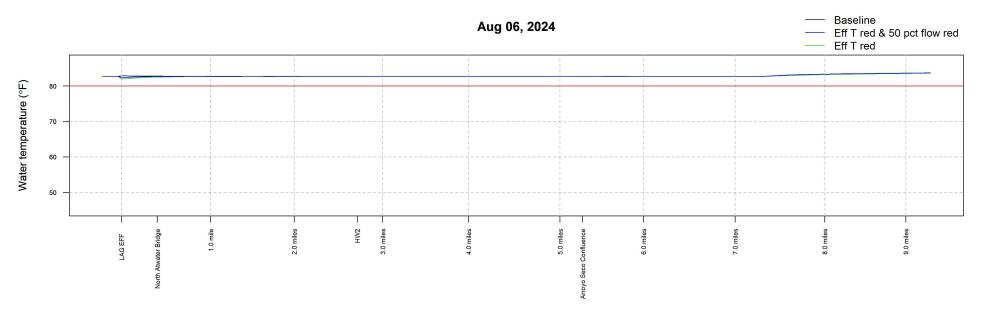
Scenario: Effluent Temperature + 50% Flow Reduction - BUR





Scenario: Effluent Temperature + 50% Flow Reduction - LAG





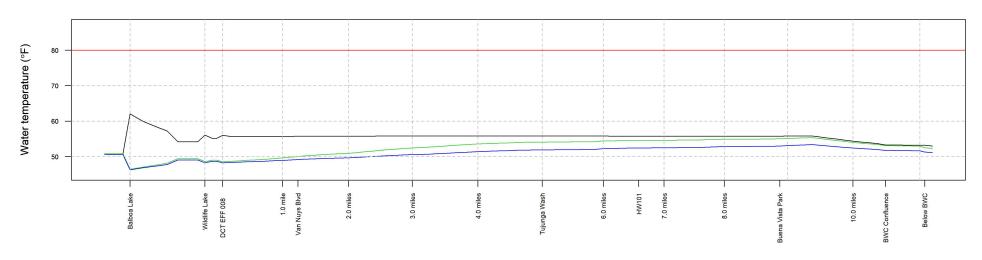
Scenario: Effluent Temperature + Shading

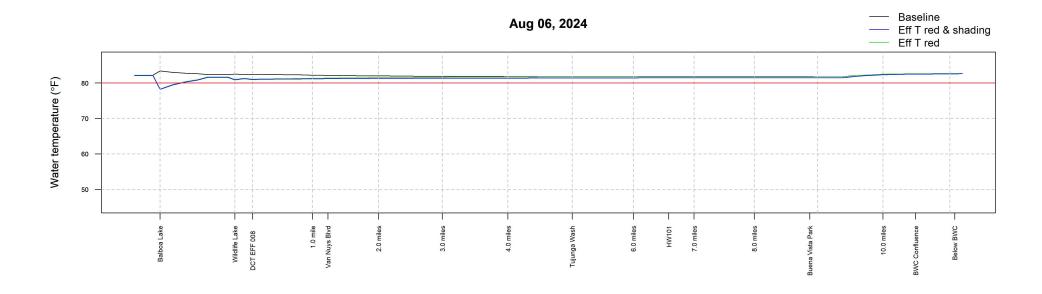
WRP effluent temperature reduced to ensure limits are met

Shading 100% riverbanks

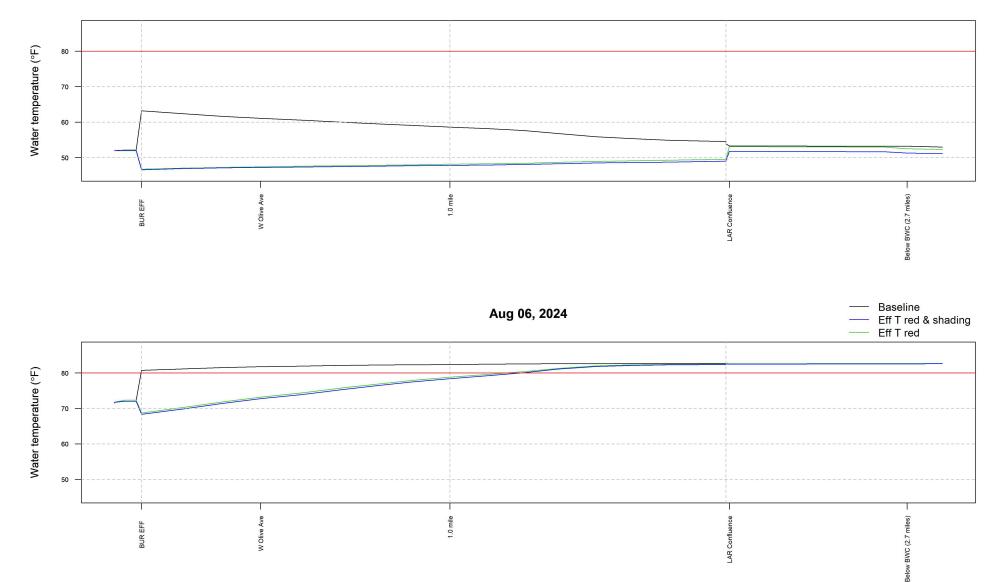
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Scenario: Effluent Temperature + 100% Shading - DCT

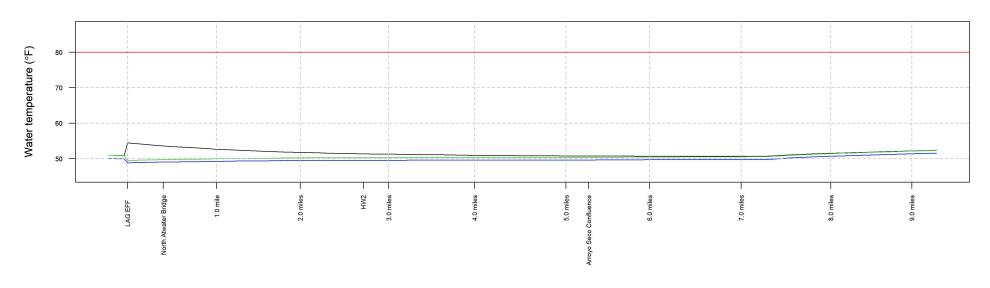


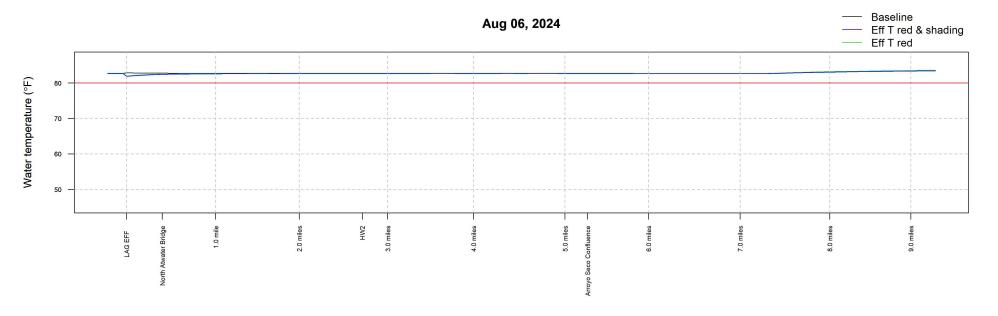


Scenario: Effluent Temperature + 100% Shading - BUR



Scenario: Effluent Temperature + 100% Shading - LAG





Scenario: Effluent Temperature + Flow Reduction + Shading

WRP effluent temperature reduced to ensure limits are met

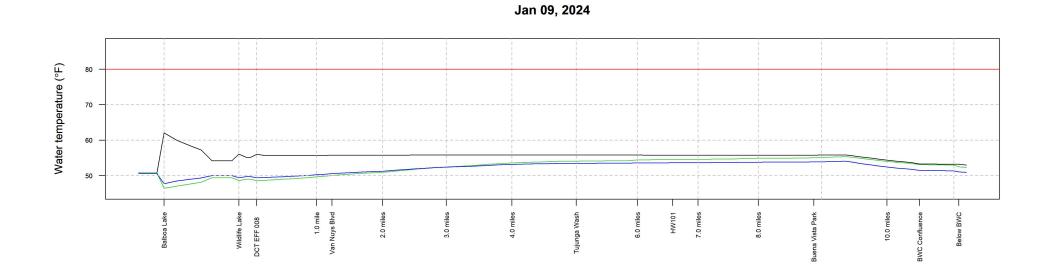
Bookend (50%) Reduced Discharge results displayed

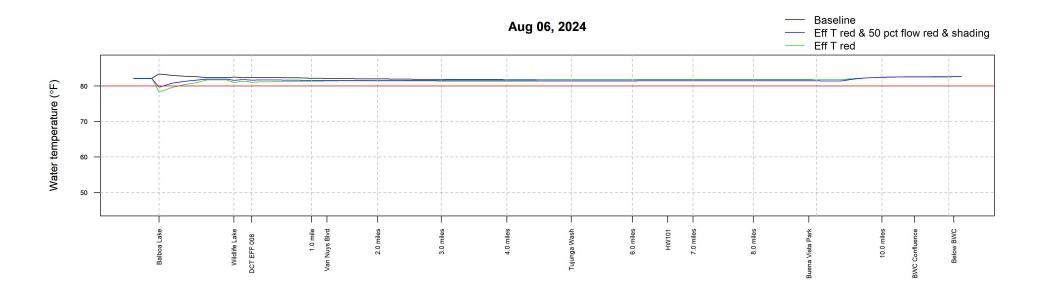
30-foot solid wall along channel

| Month | Temperature Reductions Needed to Attain WQOs (°F) | | | | |
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| | Effluent Flowrate (MGD) | | | | | | |
|-----|-------------------------|-----------|------|------|------|--|--|
| WRP | | Reduction | | | | | |
| | Current | 5% | 10% | 25% | 50% | | |
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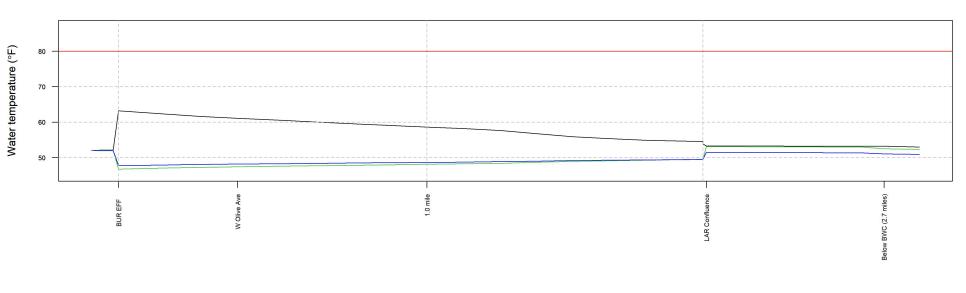
Scenario: Effluent Temperature + Flow Reduction + Shading - DCT

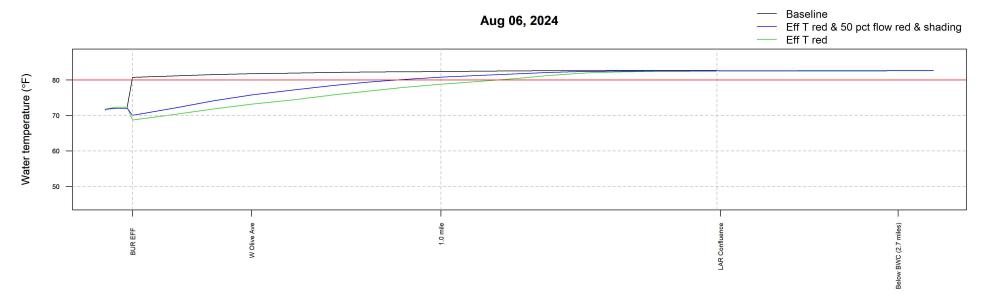




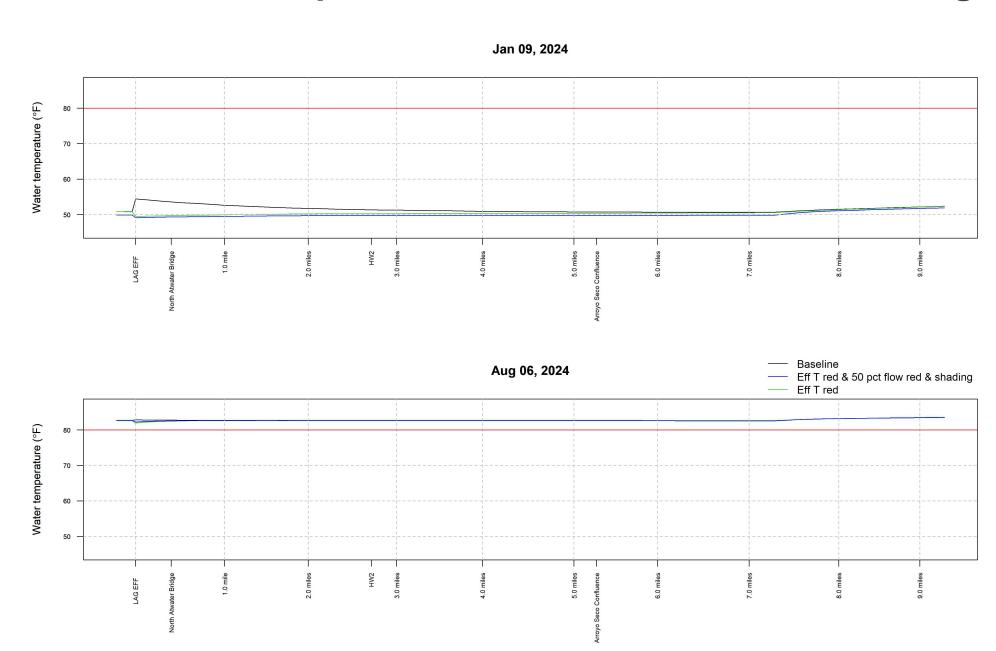
Scenario: Effluent Temperature + Flow Reduction + Shading - BUR







Scenario: Effluent Temperature + Flow Reduction + Shading - LAG



Climate Change



Future Baseline

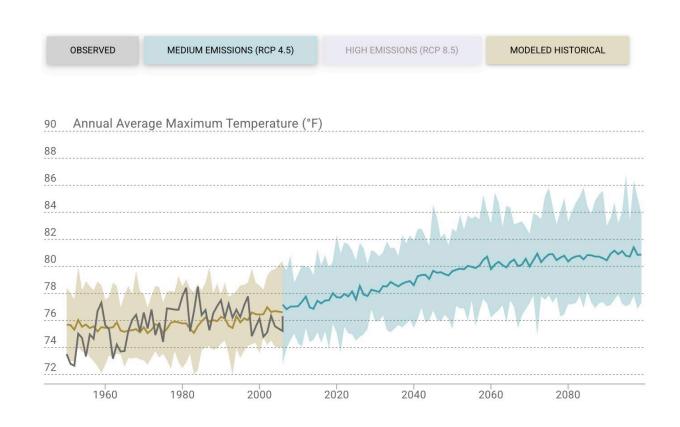
Representative Concentration Pathway (RCP) 4.5

- Most likely future emissions
- Emissions increase until mid-century, then decline rapidly.
- ~∆2 °C average annual increase

Downscaling to LA Basin

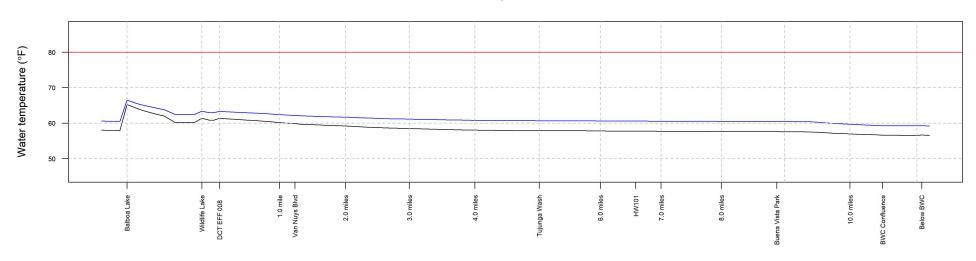
- Scripps Institute of Oceanography
- Localized constructed analogs (LOCA)
- Global Climate Models ~100 mile pixels
- LOCA -> 3.7 mile (6 km) pixels

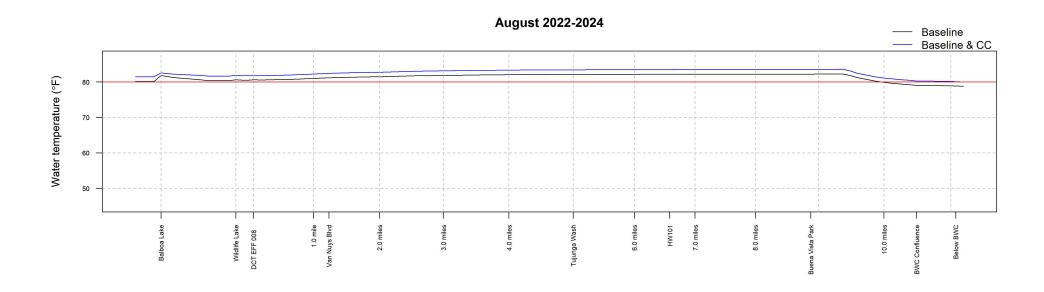
Monthly average climate change effect for plotting Results plotted for 30 years in the future



30 year Future Baseline - DCT

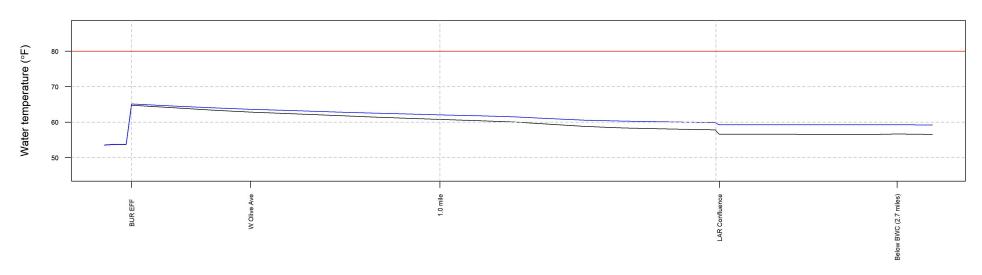
January 2022-2024

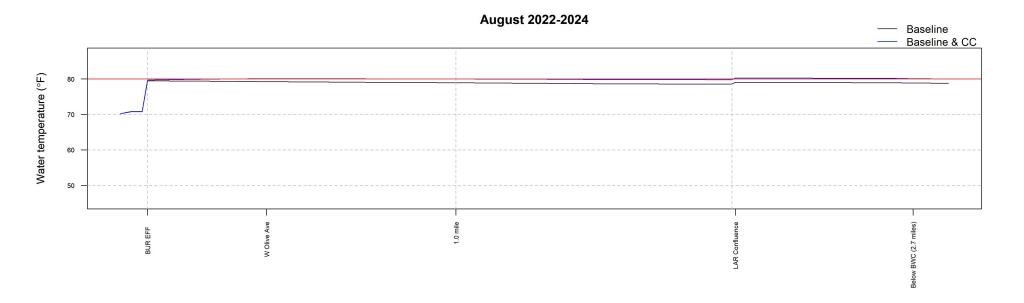




30 year Future Baseline - BUR

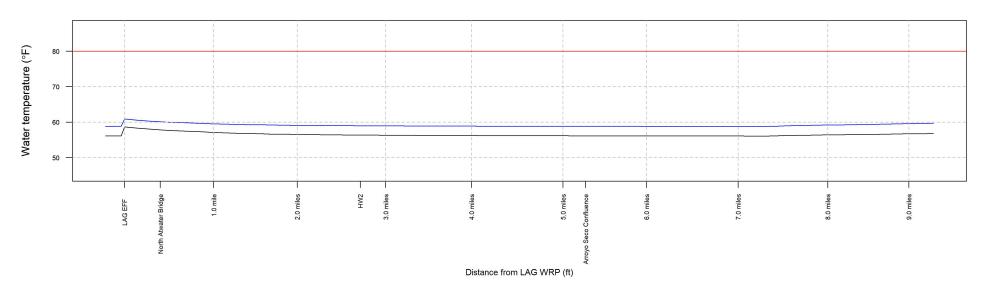
January 2022-2024

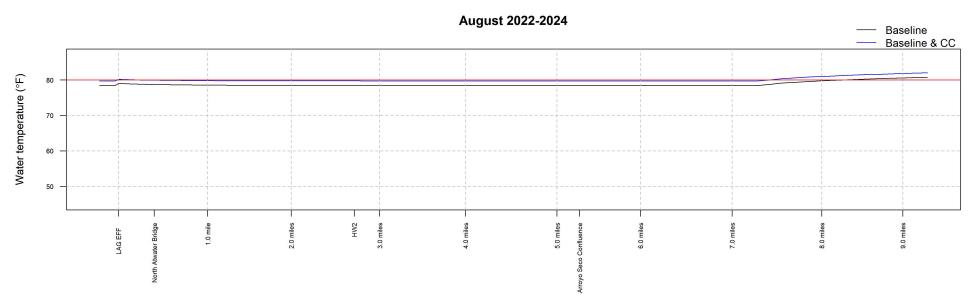




30 year Future Baseline - LAG

January 2022-2024





Future Baseline with Effluent Temperature Control

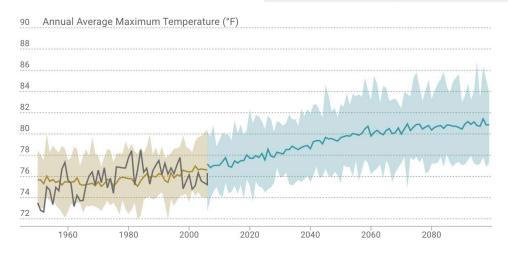
RCP 4.5

Scripps Institute of Oceanography Downscaling to LA Basin

Monthly average climate change effect

WRP effluent reduced to ensure to ensure limits are met

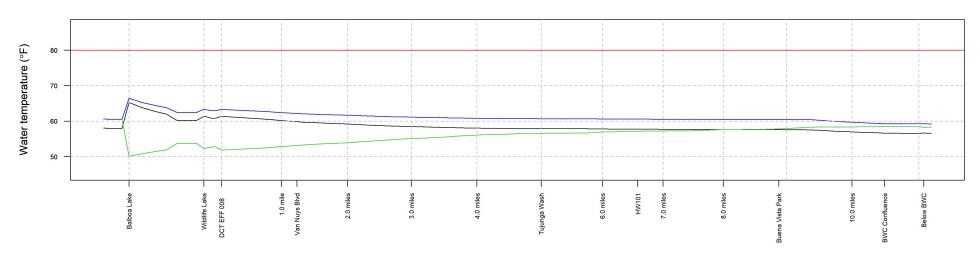
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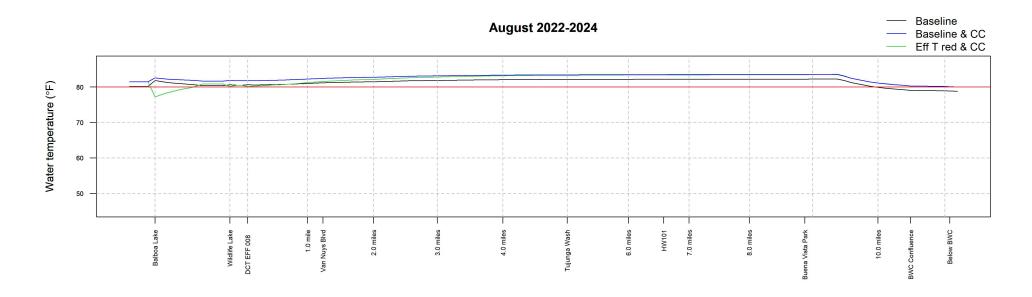


MEDIUM EMISSIONS (RCP 4.5)

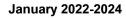
30 year Future Baseline with Effluent Temperature Control - DCT

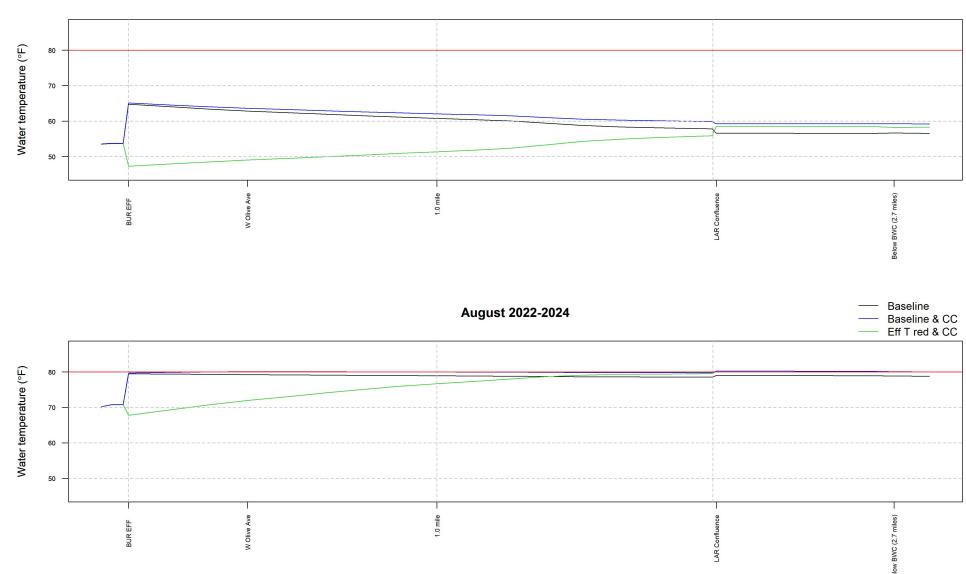




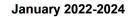


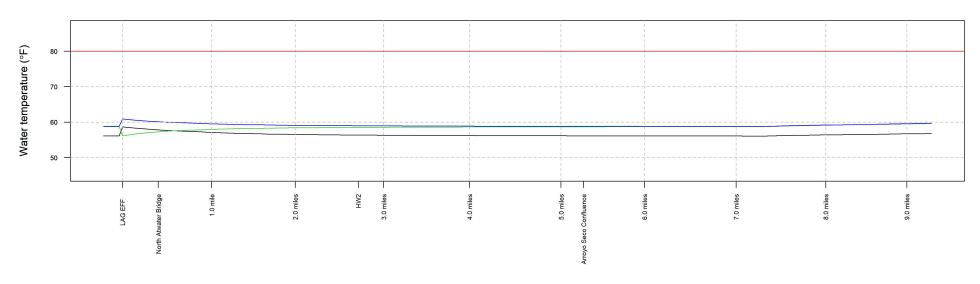
30 year Future Baseline with Effluent Temperature Control - BUR

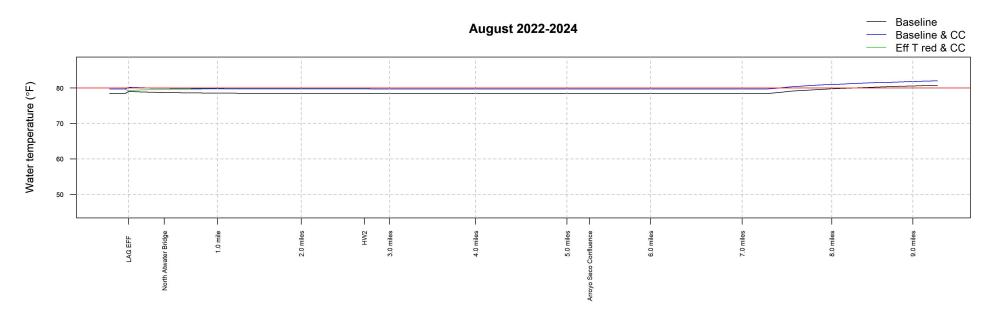




30 year Future Baseline with Effluent Temperature Control - LAG







Modeling Efforts

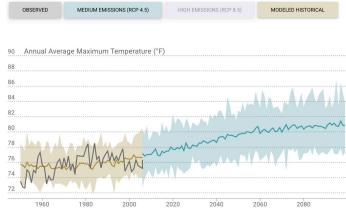
| | WRP Effluent Temperature | | Flowrate | | | Shading | Climate Change |
|---|--------------------------|--------------------------|----------|----------------|----------------|---------------------|----------------|
| Analysis | Current | Temperature Reduction | Current | Reduced 10% | Reduced 50% | Riparian Shading | RCP 4.5 |
| Baseline | Х | | Х | | | | |
| Effluent Temperature Reduction | | Х | X | | | | |
| Effluent Flow Reduction | Х | | | | Х | | |
| Shading | Х | | Х | | | Х | |
| Scenarios | | | | | | | |
| Effluent Temperature and Flow Reduction | | X | | Х | Х | | |
| Effluent Temperature Reduction and Shading | | X | Х | | | Х | |
| Effluent Temperature and Flow Reduction and Shading | | Х | | | Х | X | |
| Future Baseline | Х | | Х | | | | Х |
| Future Temperature Control | | Х | Х | | | | Х |

Modeling Summary

- Effluent Temperature Control
 - River temperatures reach equilibrium with atmospheric temperatures short distance downstream in summer
 - Winter river temperatures reach equilibrium generally further downstream
- Reducing effluent discharge, reduces heat addition to river
 - Reduces effectiveness of effluent cooling
 - Atmospheric equilibrium achieved in shorter distance
- Shading generally ineffective for LA River
 - Cannot place trees close enough to water
 - Microclimates control water temperature
- Future climate results in 1-2 °F warmer water in 30 years
- River temperature reaches equilibrium with atmosphere regardless of management action or scenario
 - Generally, within 2 4 miles downstream of discharge

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| BUR | 3.0 | 2.9 | 2.7 | 2.3 | 1.5 |



Modeling Efforts – Preliminary Findings

- Regardless of actions there is no meaningful difference in temperatures downstream of the WRPs
- Note that upstream temperatures often already exceed 80°F

| Analysis | Result 2 - 4 Miles Downstream of WRPs |
|---|--|
| Effluent Temperature Reduction | No Meaningful Change |
| Effluent Flow Reduction | No Meaningful Change |
| Shading | No Meaningful Change |
| Scenarios | |
| Effluent Temperature + Flow Reduction | No Meaningful Change |
| Effluent Temperature Reduction + Shading | No Meaningful Change |
| Effluent Temperature + Flow Reduction + Shading | No Meaningful Change |
| Future Baseline (Climate Change) | Increased Temperature |
| Future Temperature Control | No Meaningful Change from New Baseline |

Action Items/Next Steps



Schedule for Study Implementation

| Task | | FY 2024/25 | | |
|------------------------------|------------|------------|-----------|-----------|
| Idak | 10/1-12/31 | 1/1-3/30 | 4/1-6/30 | 7/1-12/31 |
| Workplan Development | Completed | | | |
| Secure Permits and Equipment | Completed | | | |
| Monitoring | Completed | | | |
| Data Compilation + QA/QC | Completed | | | |
| Modeling (Validation) | Completed | | | |
| Scenario Development | Ongoing | | | |
| Control Measure Evaluation | Ongoing | | ngoing | |
| Modeling (Scenario Analysis) | Ongoing | | | |
| Reporting | | | 12/1/2025 | |

TAC Meetings: Scenarios and Reporting

| TAC meeting date | Description of tasks |
|-------------------------|--|
| Q2 Dec 2024 | Meeting 1 – Discuss overall process with TAC and brainstorm preliminary management strategies, and specific bounds (bookends), and endpoints. Data collation for models. |
| Q3 Jan - Mar 2025 | Data compilation, QA/QC, model calibration, and preliminary analysis of effluent temperature bookend. |
| Q4 April - June 2025 | Meeting 2 – Present refined approach based on TAC input and discuss initial results and next steps. |
| Q1 | Meeting 3 - Review of bookend results and discuss scenarios analysis. Review of model development (if interested/time allows). Potentially discuss control measures. |
| July - Sept 2025 | Meeting 4 - Preliminary scenario run feedback, seek input and revise approach, if necessary. Potentially discuss additional/revised scenarios. |
| Q2 Oct - Dec 2025 | Meeting 5 - Review of results. |

Questions and Discussion

