

# Screening for Emerging Contaminants in Santa Ana Region

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Funding: State Water Board, SWAMP Region 8



# Background



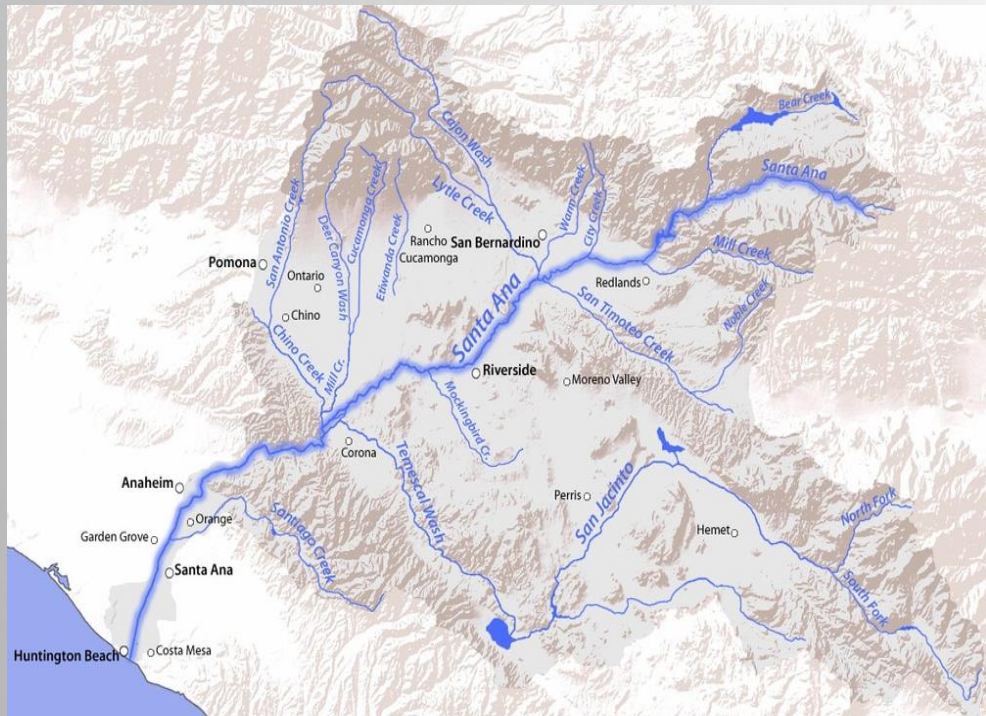
- Cell assays are increasingly used worldwide to screen for known and unknown chemicals in ambient waters
- The State Water Board has endorsed the use of cell assays
  - Included in the 2018 amended recycled water policy
  - Part of their conceptual CEC ambient monitoring framework
- Previous field studies in ca have shown the value of cell assays to:
  - Prioritize samples for which further chemical analyses are warranted
  - Predict adverse effects before severe population damage

# Application of Cell Assay Technology

Objective: Evaluate the occurrence of bioactive contaminants in ambient waters that could impact aquatic life

- Three-year study:
  - Collect water samples (20-25 sites) during wet and dry seasons
  - Analyze split samples using bioscreening tools and targeted chemistry methods
  - Investigate the relationship between bioscreening responses and concentrations of known chemicals

# Selection of Study Sites



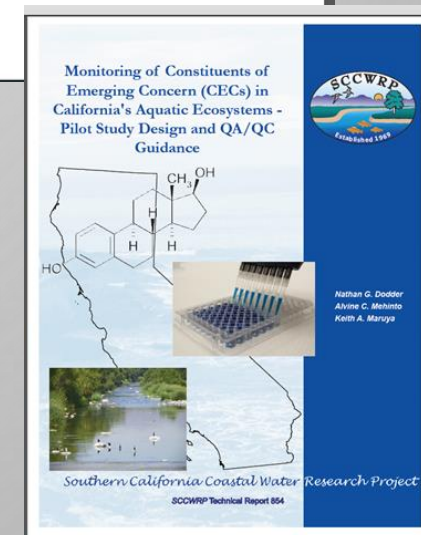
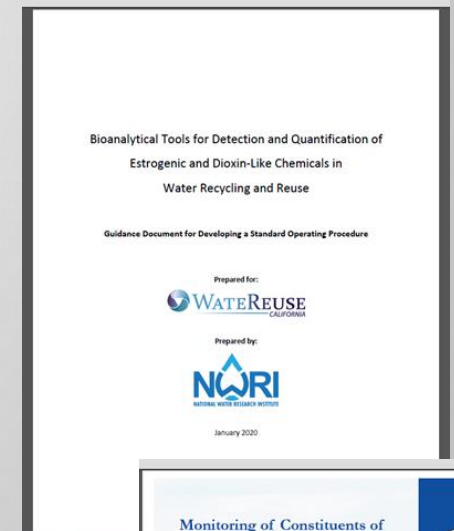
- Including sites monitored in other programs/studies, e.g.-
  - Bioassessment sites, SPoT sites
  - TMDL stations
  - Study sites for microplastics and/or HAB monitoring
- Sites reflecting varying water qualities:
  - Big Bear Lake and tributaries
  - Santa Ana River and tributaries
  - Upper Newport Bay

# Selection of Study Sites

#	Waterbody_Type	Waterbody_Name	Comments
1	Reservoir	Big Bear Lake (East end)	Where the future (if permitted) BBL Replenish discharge would occur-either use existing TMDL station #9 or sample from the Stanfield cutoff or one of the boat launches
2	Reservoir	Big Bear Lake (West end)	Forested area -some cabins on septic on USFS land -either sample at existing TMDL Station #1 or mouth of Grout Creek; North Shore landing; Pine Oak Lane North Beach/South Beach
3	Stream	Bear Creek	Downstream Big Bear Lake; Upstream of SAR; several existing Bioassessment sites
4	Stream	SAR -R6	Several existing bioassessment sites
5	Stream	SAR-R6; Barton Creek	Upper SAR watershed; existing bioassessment sites ; higher CSCI scores; headwaters
6	Stream	Mill Creek	Upper SAR watershed; existing bioassessment sites ; higher CSCI scores; headwaters
7	Stream	SAR-R6; USFS streams	Upper SAR watershed; existing bioassessment sites ; higher CSCI scores; headwaters
8	Stream	Plunge Creek	Tributary to SAR; existing bioassessment sites
9	Stream	Cajon Wash	Existing bioassessment sites
10	Depressional Wetland	Cajon Wash/Lost Lake DW	Existing bioassessment sites; Depressional wetland bioassessment site
11	Stream	Lytle Creek	Existing bioassessment sites; reference site
12	Stream	Icehouse Canyon	Upper watershed; Mt. Baldy; tributary to San Antonio Creek; Chino Creek; Prado Dam; SAR; existing bioassessment sites
13	Stream	Plunge Creek; Mill Creek R1	Existing bioassessment sites could sample concurrently
14	Stream	San Timoteo Creek	Existing bioassessment sites could sample concurrently
15	Stream	SAR-R3	Existing bioassessment sites could sample concurrently; site sampled in SAWPA CEC 2019 study
16	Stream	Temescal Creek	Existing bioassessment sites; PFAS interest (?)
17	Stream	Santiago/Silverado Creeks	Existing bioassessment sites; OC reference sites
18	Stream	San Diego Creek	Existing SPoT site; existing bioassessment sites; microplastics study site; TMDL; input to Newport Bay
19	Estuary	Upper Newport Bay	Microplastics study site; TMDL; existing OC monitoring sites
20	Wetland	Mystic Lake	HAB monitoring; receives recycled water; hunting and wildlife area
21	Stream	Strawberry Creek	Existing bioassessment sites; reports of WQ issues
22	Stream	NF SJ; Stone and Fuller Mill Creeks	San Jacinto area; existing bioassessment sites

# Sample Processing and Analyses

- Collection and extraction using previously established protocols
- Cell assay screening using:
  - ER $\alpha$  and AhR, currently in recycled water policy
  - GR to screen for anti-inflammatory medicines (e.g. fluonase, hydrocortisone)
  - 4<sup>th</sup> bioassay to be determined
- Targeted chemistry on a subset of samples
  - Subcontracted to Eurofins
  - List of analytes will be informed based on cell assay response patterns



# Schedule

- Site selection and development of detailed study workplan (by Feb 2021)
- Dry season sampling and CEC screening (Summer 2021)
- Wet season sampling and CEC screening (Fall 2021/Winter 2022)
- Data analyses and final report (by early 2023)

# Communication Plan

- Field measurement, bioscreening and chemistry data will be submitted to SWAMP database
- Workplan and draft report will be available for review by SAWPA
  - All documents also available to SCCWRP member agencies
- Periodic study updates in SCCWRP Director's Report
- Oral report of interim deliverables can be provided to SAWPA on request



# QUESTIONS?

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