Science Advisory Panel for Constituents of Emerging Concern (CECs) in California's Aquatic Ecosystems

Briefing on Panel and its major findings for SAWPA

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Background

- State formed an emerging contaminants scientific advisory panel for ambient waters about 10 years ago
  - Panel produced a 2012 report

- 2012 Panel provided several major advances
  - Offered risk assessment framework to prioritize which chemicals should be monitored
  - Applied framework to identify specific chemicals for monitoring, although sparse data on CEC occurrence hampered this effort
  - Presented approach beyond monitoring individual chemicals leveraging recent advances in cell-line assays and non-targeted chemical analysis

- Field has expanded greatly over last decade
  - Much more data on prevalence, fate, effects for ambient CECs now, especially in State
  - Considerable technological advances e.g., cell-line assays and non-targeted analysis

Current Panel

- New Panel formed to address two major goals:
  - Re-evaluate CEC strategy based on this information and update recommendations
  - Provide recommendations for monitoring program development for State

- Launched October 2020 by webinar
  - Met numerous times by videoconference working meetings and offline work
  - Met twice in person (Feb. and May 2022)
  - Final report-out (and draft final report) by webinar December 12, 2022
  - Final report to be submitted March 2023

Panelists

- Dr. Jörg Drewes (Chair)
  - Civil Engineer, Technical University of Munich, Germany

- Dr. Paul Anderson
  - Independent Consultant

- Dr. Daniel Schlenk
  - Ecotoxicologist, UC Riverside

- Dr. Adam Olivieri
  - Risk Assessor, EOA Incorporated

- Dr. Nancy Denslow
  - Biochemist, University of Florida

- Dr. Shane Snyder
  - Analytical Chemist, Nanyang Technological University, Singapore

- Dr. Derek Muir
  - Environmental Chemist, Environment and Climate Change Canada

Products from current Panel

1. Guidance for structure, quality assurance, and visualization of CECs covered by existing State Water Board CEC dataset

2. Guidance to use other sources to inform CEC monitoring program

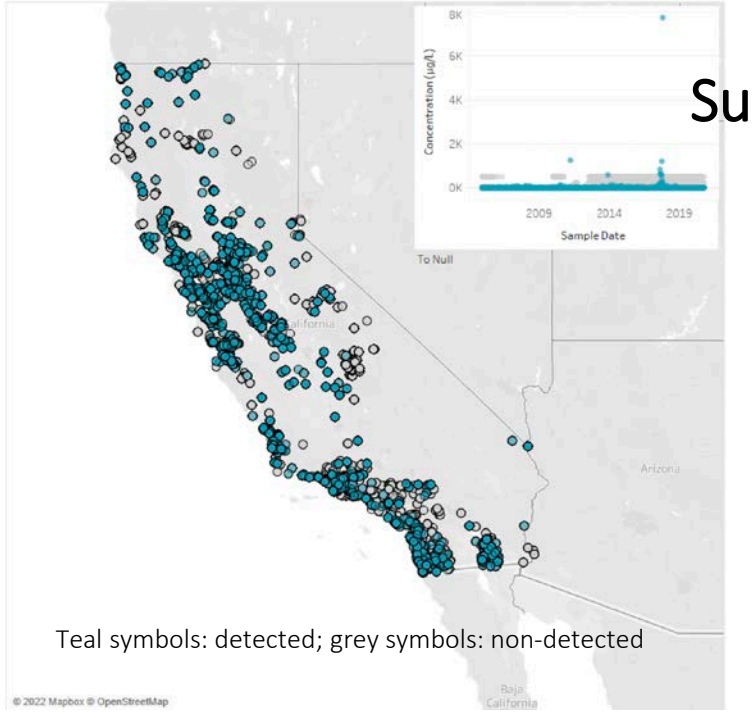
3. Updated risk-based approach to assess and identify CECs for monitoring

4. Establishment of sound foundation for state-wide and regional CEC monitoring programs

Product #1: Guidance for structure, quality assurance, and visualization of CECs covered by existing State Water Board CEC dataset

- Previous Panel suggested CECs for monitoring based primarily on literature data
- Current Panel has state dataset since 2005, as recommended by previous Panel
  - State Water Board has CEC program with dedicated staff
  - Dataset retrospective: known compounds (by class) with established analytical methods
  - Dataset continually updated, with dashboard application to evaluate geographical occurrence
  - Panel's recommendations include how to improve QA/QC on data, and use existing data given limitations in coverage and data quality

Media	Total measurements	Above detection limit
Surface waters (total)	427,111	54,328 (13%)
Surface waters (freshwater)	280,653	33,561 (12%)
Surface waters (estuarine)	8,880	1,550 (17%)
Marine water	21,385	6,399 (30%)
Sediment	130,652	27,812 (21%)
Biota	30,481	10,217 (34%)

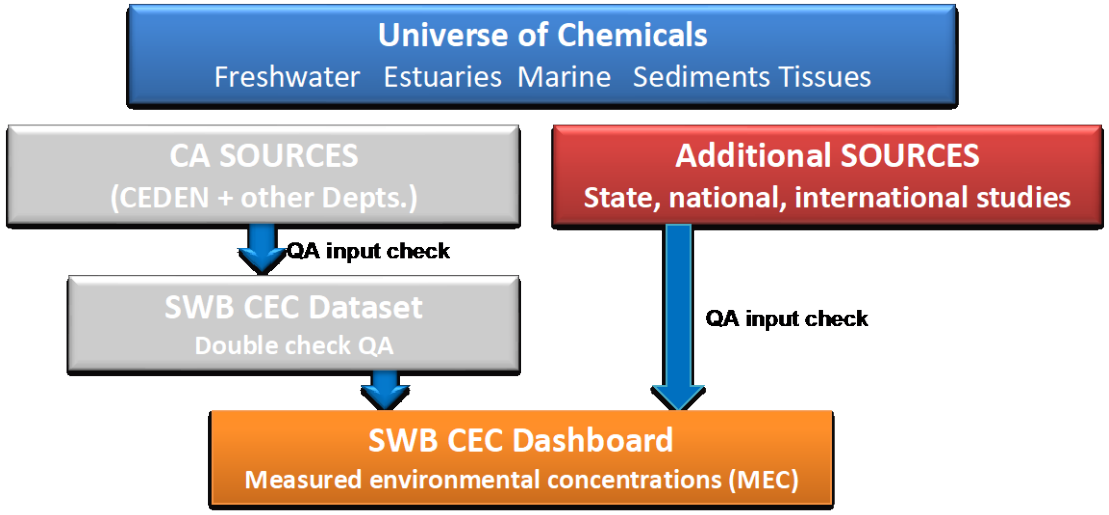


Surface waters

Teal symbols: detected; grey symbols: non-detected

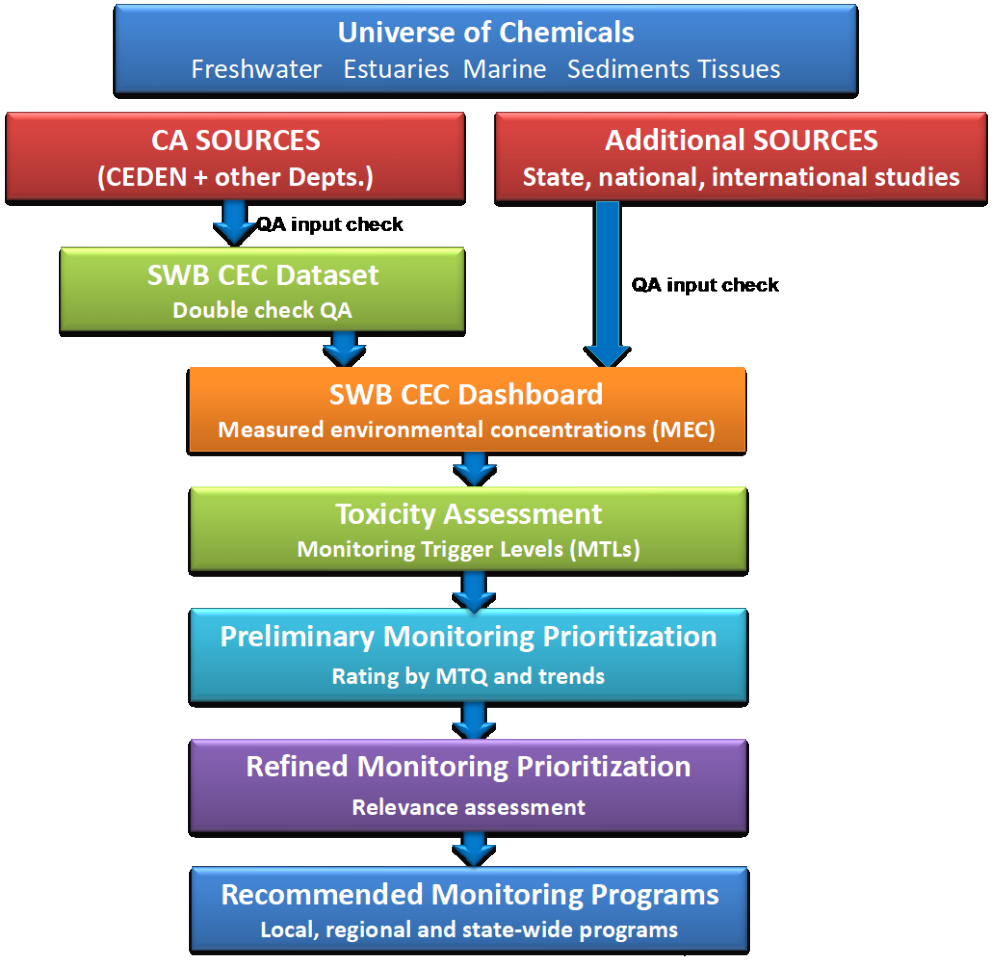
Product #2: Guidance to use other sources to inform CEC monitoring program

- Additional occurrence sources should be considered, in and outside state
  - Need prospective approach to complement retrospective dataset
  - Other monitoring programs
  - Literature reviews
  - Non-targeted analysis to assess known and unknown biological effects of CECs
  - USEPA CompTox and other ecotoxicology database screening of potentially relevant CECs



- 133 compounds included in “new CECs” list
  - On top of 423 compounds from retrospective analysis (Product #1)
  - 21 of “new CECs” selected for prioritization evaluation (Product #3) including 6PPD-quinone (tire wear compound toxic to fish)

Product #3: Updated risk-based approach to assess and identify CECs for monitoring



- Panel expanded previously developed risk-based screening framework
- Updated framework has 4 primary steps
  - Toxicity assessment: developing monitoring trigger levels (MTLs) based on published effects concentrations
  - Preliminary monitoring prioritization: rating short-lists of CECs based on measured environmental concentrations and trends when MTLs can be estimated
    - High, Moderate, Low, No Concern
  - Refined monitoring prioritization: Priority ranking of CECs based on sample size, verifying spatial and temporal trends, and monitoring trigger quotient (MTQ)
  - Recommended monitoring program: specifying nature of local, regional, statewide monitoring efforts

Product #4: Establishment of sound foundation for state-wide and regional CEC monitoring programs

- Complement continuing risk-based monitoring approach with temporal and spatial evaluations
- Improve data quality reported to State Water Board
- Regularly update monitoring trigger levels (MTLs) as new CEC monitoring/tox info available
- Develop pilot biomonitoring program focused on early ID of effects in ambient waters
- Work with future Ambient Ecosystems CEC Advisory Panel or equivalent process for expert review
- Update existing policy and monitoring requirement and approach, to manage CECs
- Guide state-wide CEC monitoring program for receiving waters by State Water Board staff

For more information

- https://www.sccwrp.org/about/research-areas/emerging-contaminants/cec-ecosystems-panel/