Constituents of emerging concern in California's aquatic ecosystems
Science Advisory Panel

Interim progress report meeting
2/10/22

- Meeting will start at 3pm
- Please contact Dan Ortiz (dano@sccwrp.org) if you've connection difficulties
- Please use the Q&A box if you have questions for the public comment period
- Presentation will be recorded and posted on SCCWRP website

Background

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

- 2012 Panel provided a number of advances
  - Offered risk assessment framework to prioritize which chemicals that should be monitored
  - Applied framework to identify specific chemicals that should be monitored, 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 and fate for ambient CECs now
  - Cell-line assays and non-targeted analysis have advanced considerably

Panelists

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

- Dr. Paul Anderson
  - Toxicologist, Arcadis

- 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

Panel Schedule

- Meeting series #1: October 12-15, 2020 (by webinar)
  - Hear perspectives from variety of interested parties
  - Review charge questions
  - Working sessions to develop approach to address questions

- Periodic videoconference working meetings and offline work

- Meeting series #2: February 7-10, 2022
  - Working meetings to address charge questions
  - Present current status

- Meeting series #3: May 2022
  - Working meetings to refine charge questions
  - Public status report meeting in late May

- Panel draft report anticipated this fall

Today's schedule

- Introduction (Charles Wong, SCCWRP)

- State of California perspective on CECs and Panel recommendations
  - Claire Waggoner (State Water Board)
  - Kaitlyn Kalua (Ocean Protection Council)

- Current status of Panel
  - Dr. Jörg Drewes, Panel Chair

- Comment period
  - Please use the Q&A box to ask questions
  - Moderator will introduce questions to Panel
  - Further questions? Please contact Charles at charlesw@sccwrp.org

Charge questions

1. Which classes of CECs, including those with data gaps, have the potential to adversely impact marine, estuarine and freshwater wildlife, ecosystems, and beneficial uses in marine, estuarine and freshwater environments?
   a. Who are the leaders in the academic field for each of these classes of CECs?
   b. What are the applicable monitoring methods and reporting limits for these classes of CECs?

2. Update the risk prioritization framework developed in the 2012 report to address classes of chemicals, structurally-related chemicals (that may not be within the same class), and data-poor chemical classes (e.g., where there is either no monitoring trigger level or environmental concentration or predicted no-effect concentration)

3. What are the sources, pathways, and rate of inputs leading to the presence of classes of CECs in the marine, estuarine and freshwater ecosystems?

Charge questions

4. Considering the physical, chemical, and biological processes that affect the transport and fate of classes of CECs, what matrices (i.e., tissue, sediment, ambient water, and wastewater) should be screened in each of the three following ecosystems: marine, estuarine and freshwater?

5. What are the most important known and unknown biological effects for specific or classes of CECs and what approaches should be used to assess biological effects of classes of CECs to sentinel species in marine, estuarine and freshwater ecosystems?

6. How can state management agencies better address classes of CECs in the environment through implementation of the risk prioritization framework? Specifically, how can the State Water Board better address CECs?

Water Boards' Constituents of Emerging Concern (CECs) Program

2020-2022 Science Advisory Panel for CECs in Aquatic Ecosystems

Claire Waggoner

Sustainable Water Plans and Policies

Division of Water Quality

CALIFORNIA Water Boards

CALIFORNIA OCEAN PROTECTION COUNCIL

February 10, 2022

Panel Recommendations Inform the Statewide CEC Program and Management Strategy

- Source ID/ Control
- Interagency Coordination
- Surveillance
- Public Outreach
- **CEC Program**
- Information Collection
- Synthesis and Prioritization
- Fate and Transport

Program Development and Implementation

CEC Program Implementation

- CEC Management
- Program Development
- Adaptive Management
- Research
- Voluntary Monitoring
- Investigative Orders
- Permit Requirements

Thank You

Sustainable Water Plans and Policies Section

Claire.Waggoner@waterboards.ca.gov

Pretreatment and CEC Unit

Erica.Kalve@waterboards.ca.gov

Sarabeth.George@waterboards.ca.gov

February 9, 2022

Update of Expert Panel CECs in Ambient Waters

Where did we come from?

- Risk-based tiered CEC selection framework (Panel 2012, Panel 2022)
- Panel 2012 list of suggested CECs for monitoring primarily based on literature data
- Panel 2022: SWB CEC dataset with CA occurrence data since 2005
- SWB is building CEC program with dedicated staff in charge
- SWB CEC dataset is retrospective using knowledge about known compounds using established analytical methods
- Need to expand view to include ‘new’ emerging CECs

Evaluation of the current SWB CEC dataset

- Available as comprehensive, constantly updated dataset and as dashboard application to evaluate geographical spread in occurrence

CEC dataset (2005-2020) characteristics

Media	Total measurements
Surface waters (freshwater, estuarine & marine)	429,200
Sediment	136,160
Biota	30,480

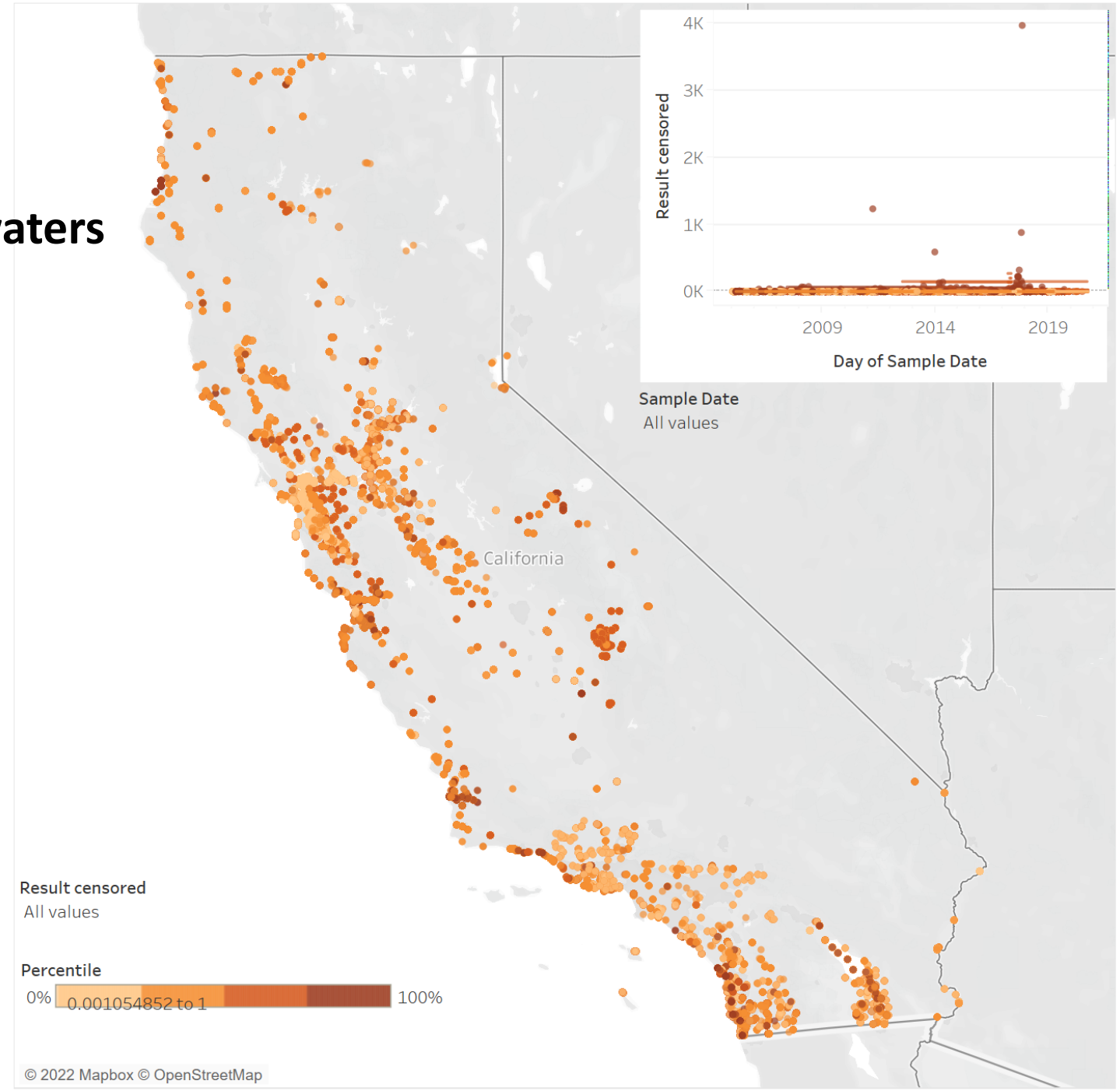
CEC analytical results

Surface waters	Total Number of chemicals analysed	Detected (1 or more samples)
Freshwater	343	257
Estuarine	334	200
Marine	147	99
Biota	85	47

Evaluation of the current SWB CEC dataset

- Available data confirm the Panel 2012 selection of relevant CECs
- Dataset requires refined quality assurance
  - starting with inputs
  - how data are sorted and extracted
- Opportunities
  - Addressing the occurrence of classes of compounds
  - Evaluating time series
  - Assessing geographical spread

Surface waters



Result Reported or ND?
- [x] Result Not Reported / nan
- [x] Result Reported

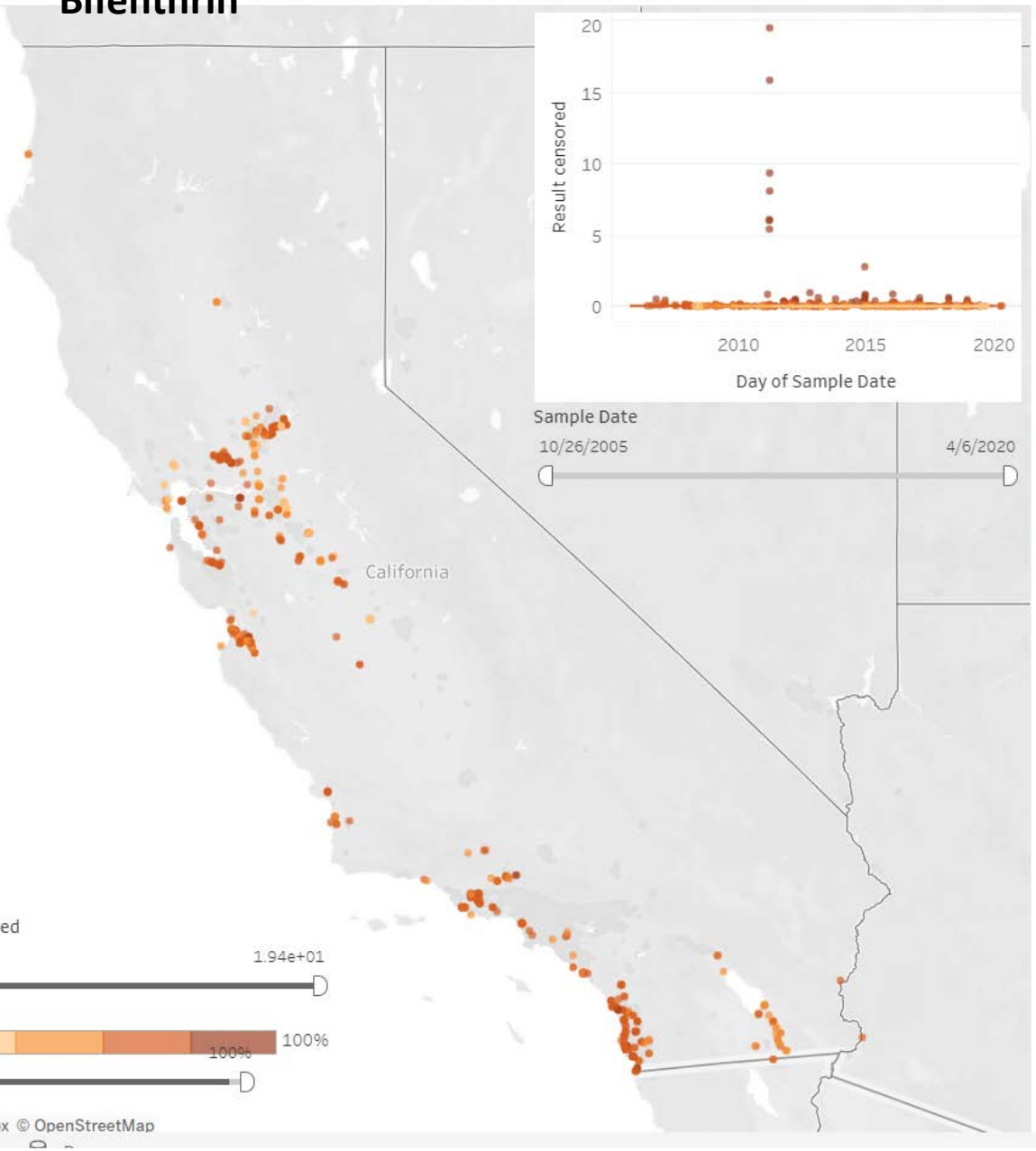
Site Type
- [x] Estuarine
- [x] Freshwater
- [x] Marine

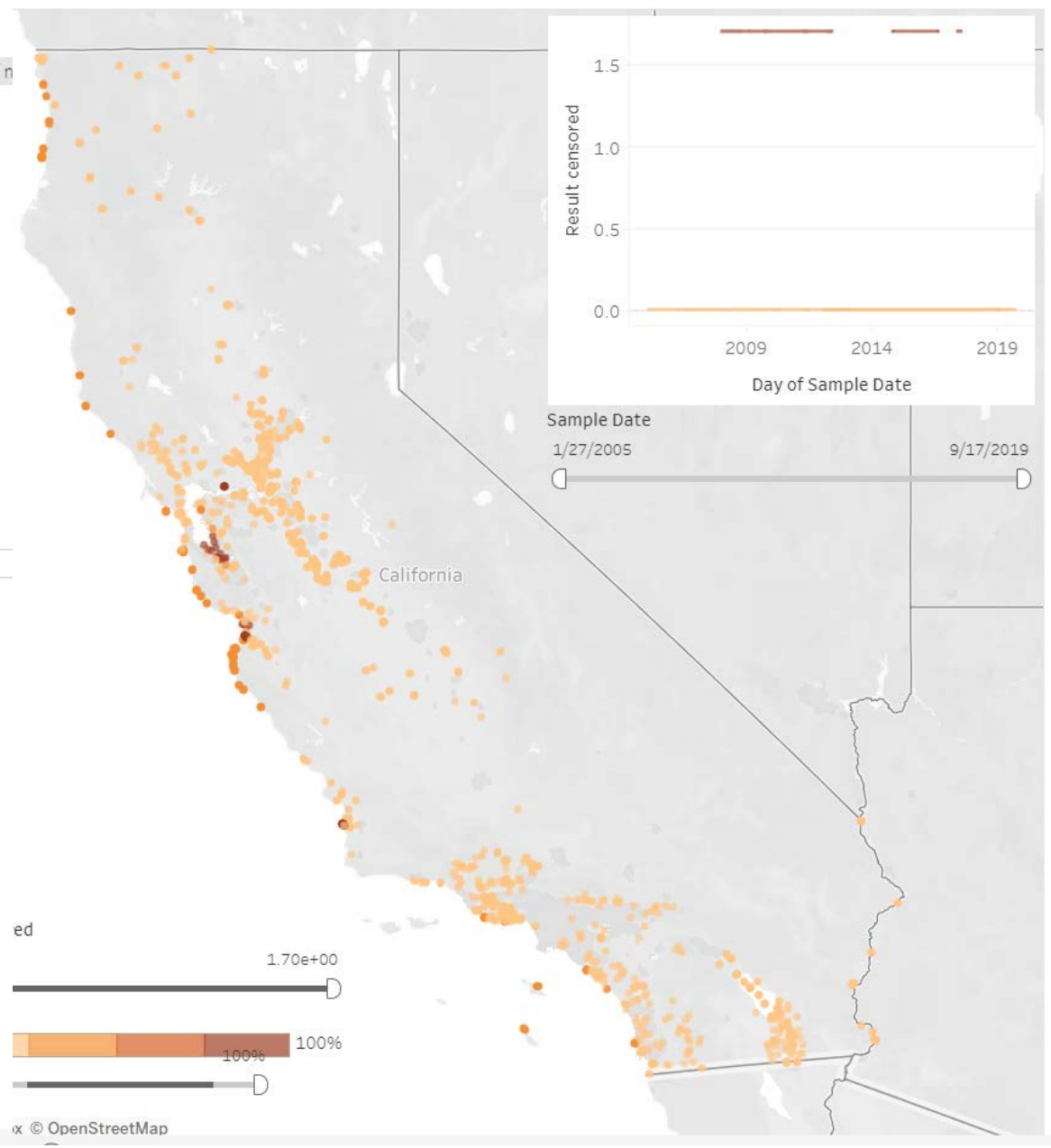
Sample Matrix
- [ ] Benthic
- [ ] Biota
- [ ] Bird
- [ ] Mammal
- [ ] Sediment
- [x] Water

Analyte Class
- [x] AP/APEs
- [x] BFR
- [x] Bisphenols
- [x] HABs
- [x] OPEs
- [x] PBB
- [x] PBDE
- [x] Personal Care Product
- [x] Pesticide
- [x] PFAS
- [x] Pharmaceutical

Analyte
- [x] 1,2-bis(2,4,6-tribromophen..
- [x] 2-(4-nonylphenoxy)ethanol
- [x] 2-[2-(4-nonylphenoxy)etho..
- [x] 2-Aminobenzimidazole
- [x] 2-Chloro-N-(2-ethyl-6-meth..
- [x] 2-ethyl-1-hexyl-2,3,4,5-tetr..
- [x] 2-Ethylhexyl diphenyl phos..
- [x] 2-nonylphenol
- [x] 2,4-dichlorophenoxyacetic ..
- [x] 2,4,6-tribromophenyl allyl ..
- [x] 3,4-Dichloroaniline

Bifenthrin

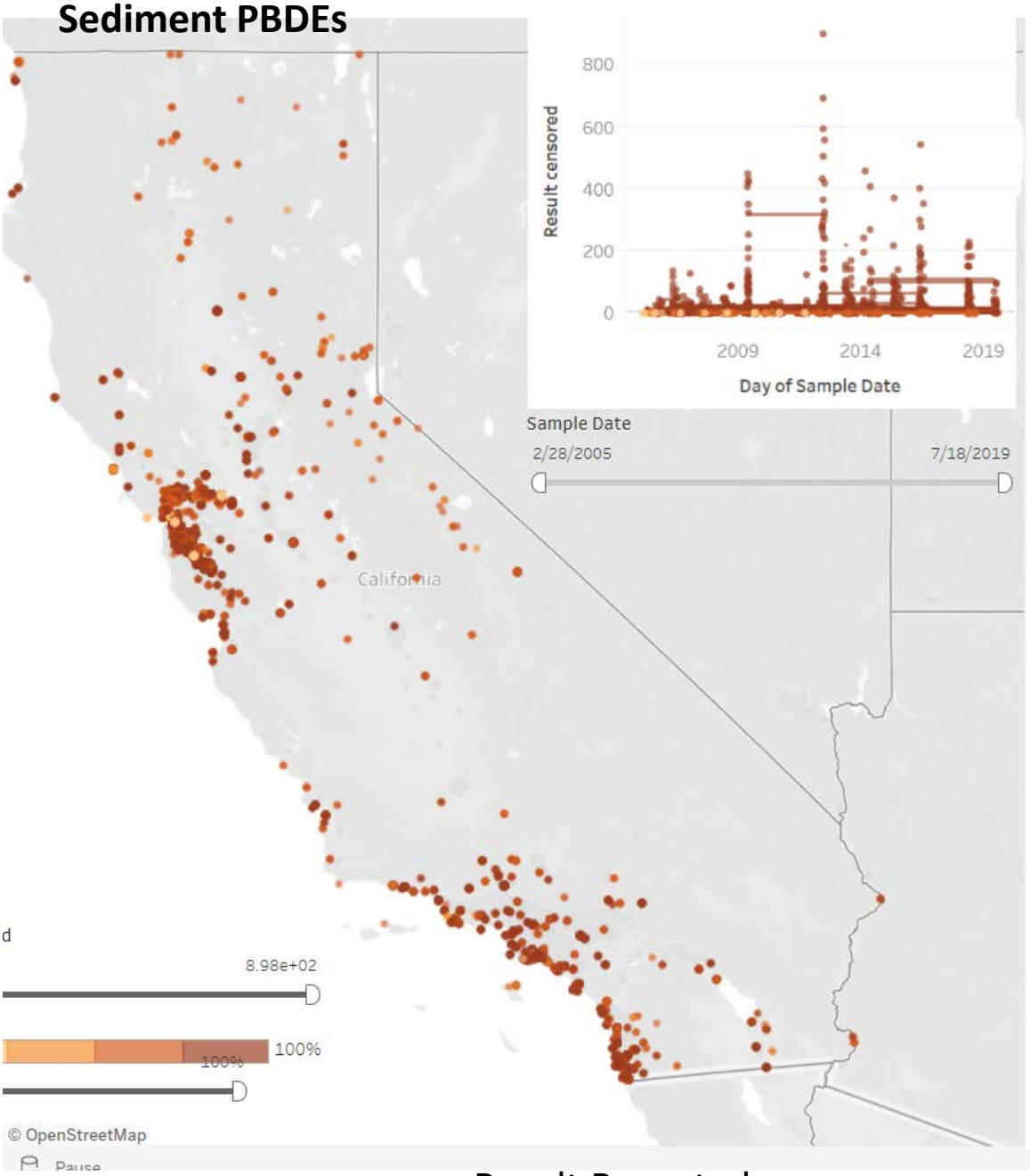


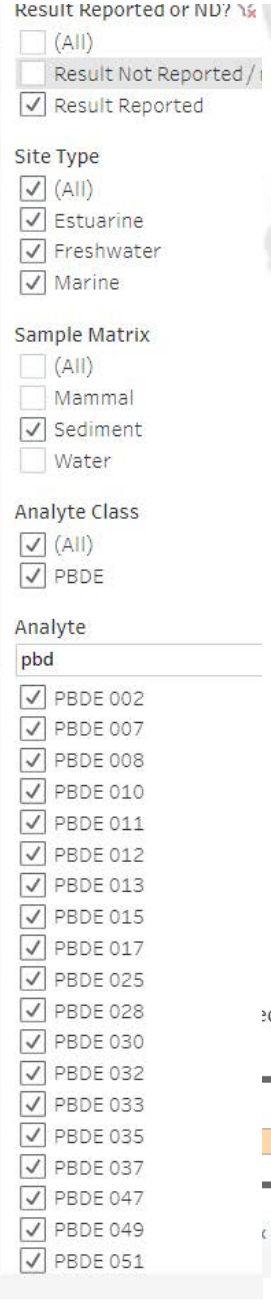


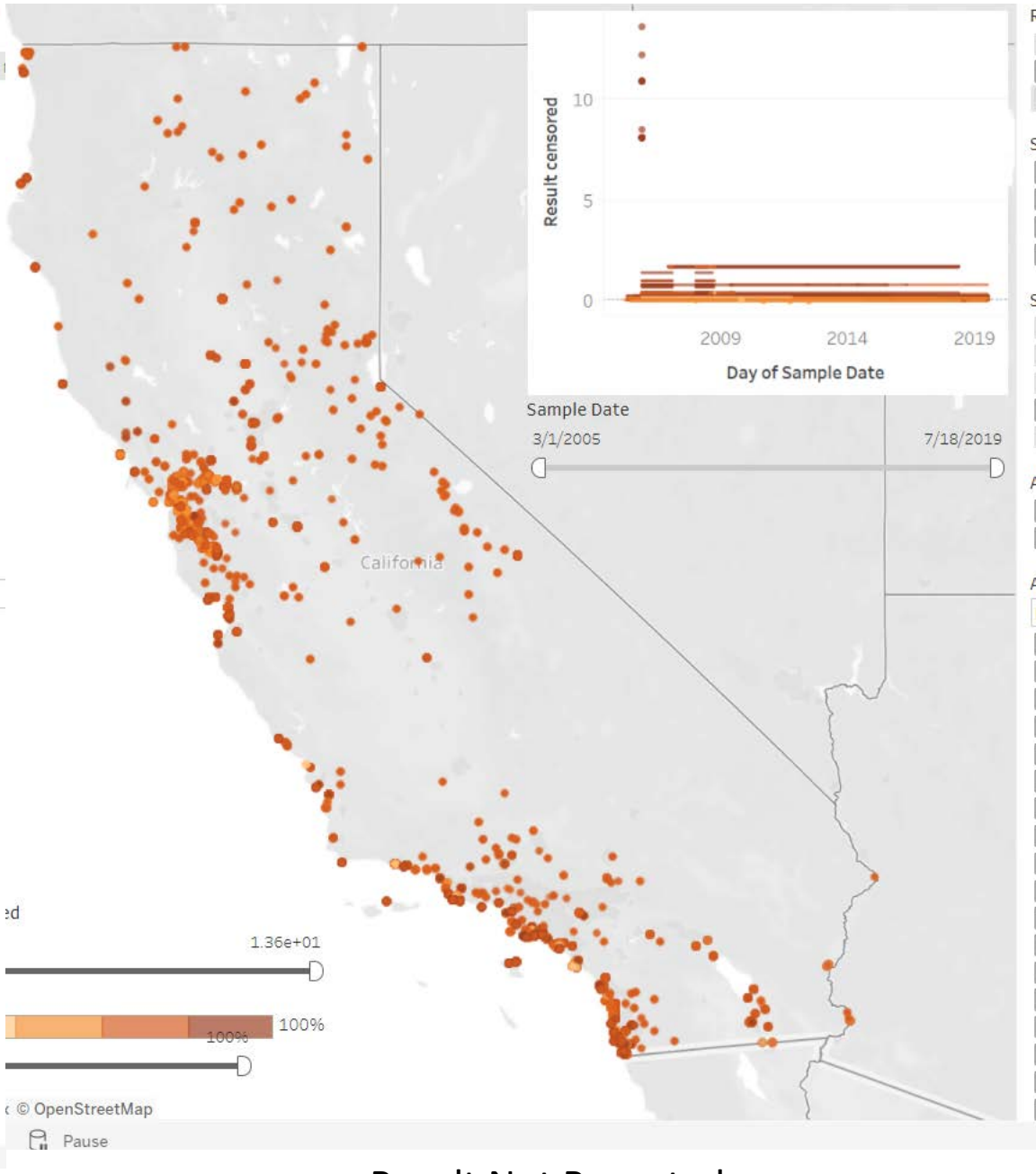
Result Reported

Result Not Reported

Sediment PBDEs







Result Reported

Result Not Reported

Evaluation of the other sources to inform the selection of possibly relevant CECs

- Possible sources of additional information with strong evidence of relevance (f(x) = (occurrence, toxicity thresholds))
- Monitoring program and database under the responsibility of other state and federal programs (CA DPR, DWR, DTSC, etc.; USGS; NOAA)
- Literature reviews targeting studies regarding occurrence of ‘new’ CECs in ambient waters (within CA, within the US, internationally)
- Effect-based analysis and NTA screening studies
- Regular USEPA CompTox screening on potentially relevant CECs

Next steps

- Goal: Informed tailored monitoring program
- Selection framework for SWB CEC database
- Selection framework using other sources (federal, state, literature)
- Binning approach for statewide or regional approach
  - state-wide vs. local occurrence
  - necessary monitoring frequency
  - linked to risk assessment taking local conditions and frequency of occurrence into consideration
- On-ramp process and off-ramp requirements