



Emerging Contaminants in California: Observations with Targeted Analytical Techniques

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What is Targeted Chemistry?

Analytical methods designed to quantify specific “target” chemical contaminants in an environmental matrix

I will touch on:

- Availability of targeted chemistry data in California
- Practical considerations for future study design

State CEC Synthesis: Targeted Chemistry

- Synthesize CECs data in California waters
 - Ambient: Water, sediment, tissue
 - Pathways: Stormwater, wastewater, recycled water
- Screen for potential ecotoxicity concerns
 - Tiered risk-based framework
- Suggest initial monitoring, management priorities
 - Informed by risk screening, use trends, persistence, other factors
- Identify data gaps

Classes of CECs: Urban Sources

2012 EcoPanel Recommendations

Poly- and perfluoroalkyl substances (PFAS)	.....	PFOS
PBDEs, other brominated flame retardants	.....	PBDE 47, 99
Organophosphate esters		
Bisphenols	.....	BPA
Phthalates	.....	DEHP, BBzP
Alkylphenols, alkylphenol ethoxylates	.....	4-NP
Pharmaceuticals, hormones	Diclofenac, Ibuprofen, Estrone, 17- β estradiol	
Personal care, cleaning products	.....	Galaxolide, Triclosan
Urban current-use pesticides, degradates	.....	Bifenthrin, Fipronil, Permethrin

Data Richness Varies

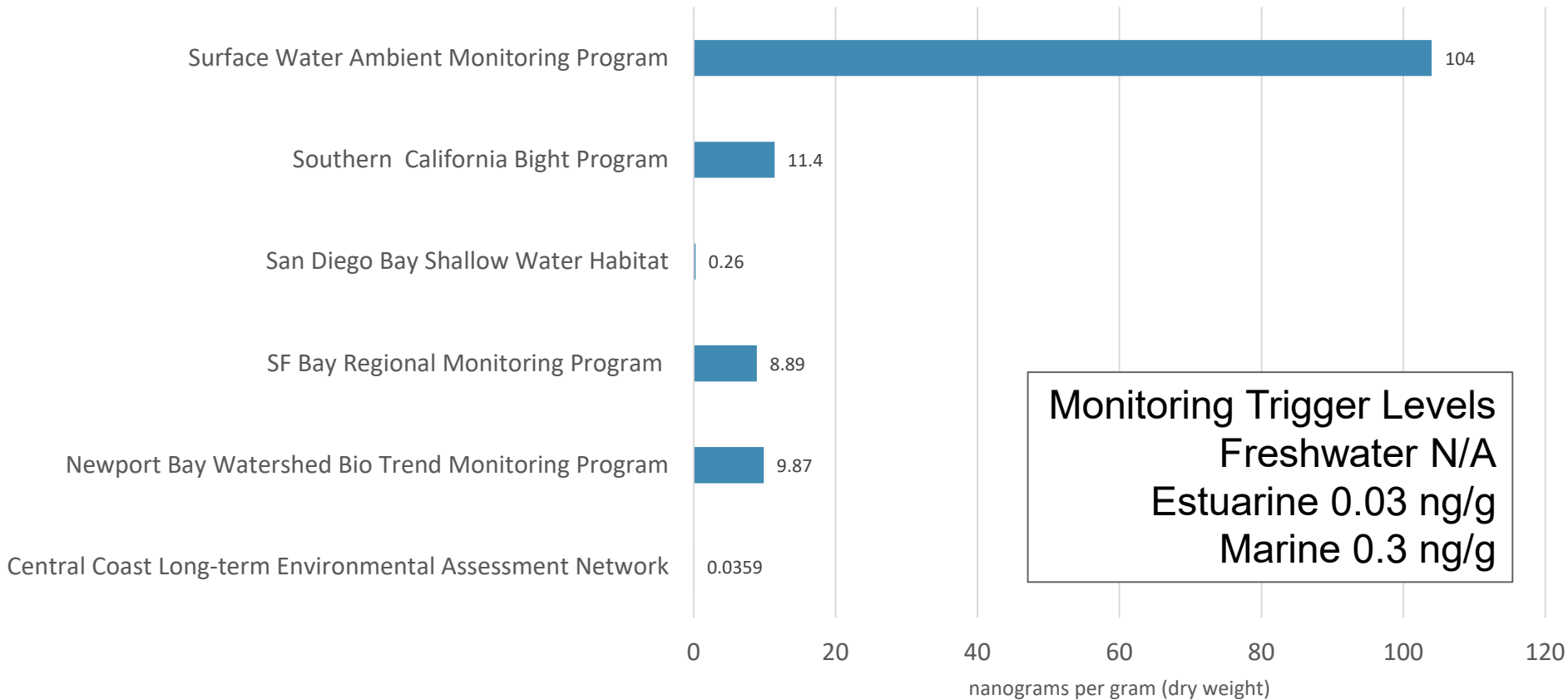
Work in Progress!

Data-base	PFAS	BrFRs	OPEs	Bis-phenols	Phthal-ates	APs APEs	Pharm	Personal Care	Pesti-cides
CEDEN (state)	W 400 S 588 E 110	W 12k S 19k E 18	W 327 S 225	W 1 S 14	W 5k S 332	W 13 S 39	W 3k S 87 E 110	W 54 S 171 E 5	W 152k S 17k E 18
CIWQS (state)		W 5k	W 9		W 47k		W 7k	W 3	W 13k
Water Quality Portal (USGS)		W 32 S 148	W 608 S 1	W 116 S 1	W 419	W 302 S 1	W 15k S 6	W 3k S 26	W 165k S 28k

W water (freshwater, estuarine, marine), including streams and stormwater
 S sediment
 E wastewater effluent

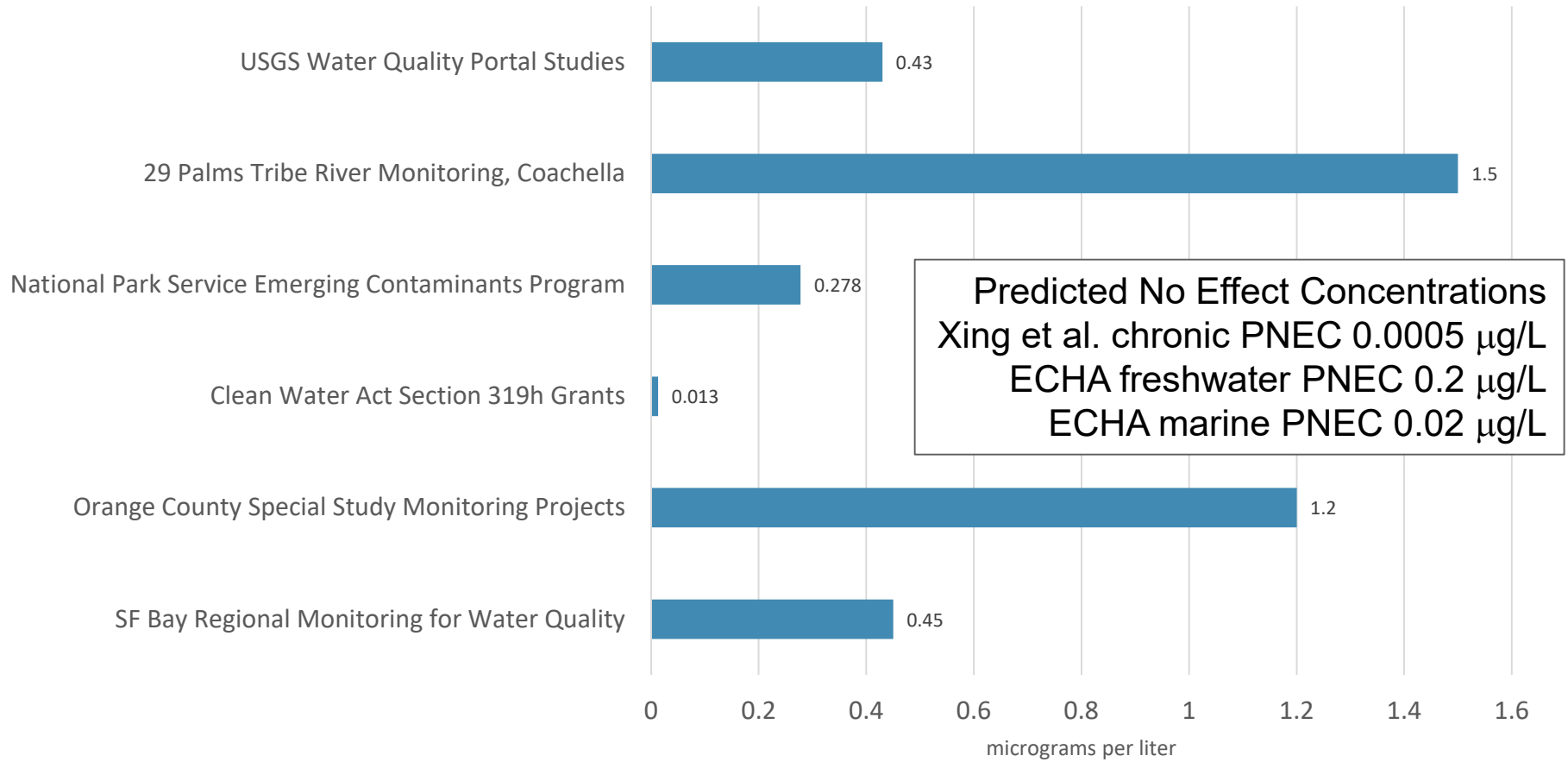


PBDE-47 in Sediment (maximums, 2005+)



TDCPP in Water

(maximums, tris(1,3-dichloro-2-propyl) phosphate)



Practical Considerations: Class-based Methods

A single targeted analytical method can detect dozens of chemically similar contaminants

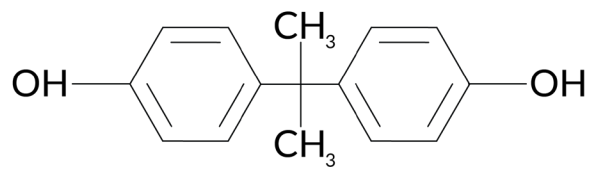
However, a short list of diverse CECs can mean the need for many methods, more resources

If a method provides data beyond an analyte of interest, acquire and review data for all contaminants

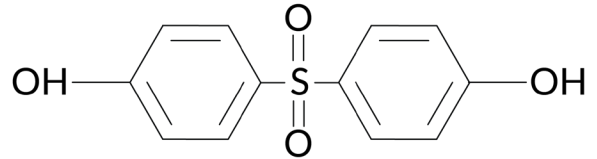
Practical Considerations: Standard Methods, New CECs

By the time a CEC is part of a standard method widely available in commercial labs, it may already be going through regrettable substitution

Bisphenol A



Bisphenol S



Practical Considerations: Method Selection

Standard Methods

- Commercial lab
- Discrete analyte list
 - Available standards
- Prompt turnaround
- Standardized QA, data management
- Readily comparable across studies

Exploratory Methods

- Academic lab
- Adaptable analyte list
 - New CECs
- Academic timetable
- Training needed for QA, reporting
- Uncertainty regarding comparability

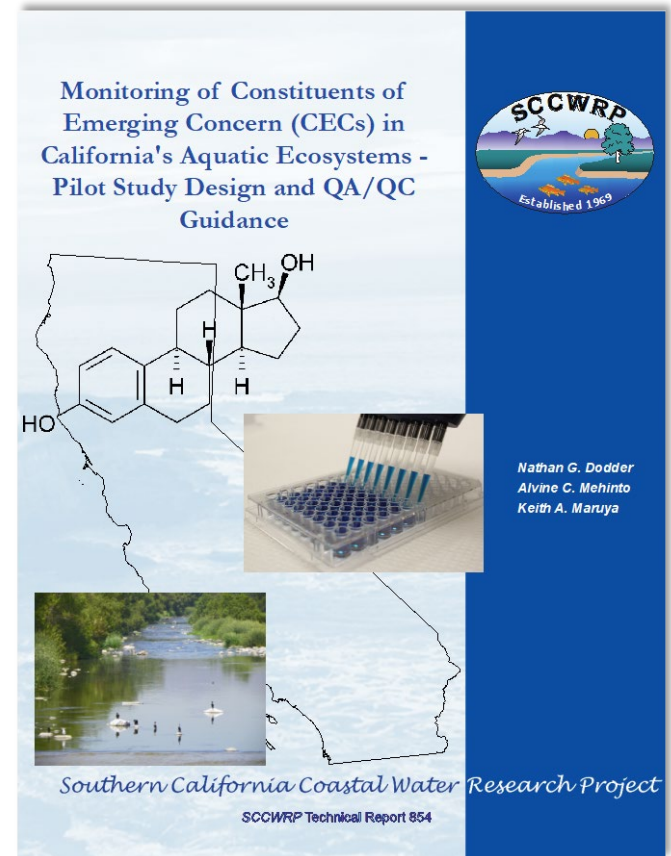
Practical Considerations: Study Design, Site Selection

Ambient environment vs. pathways

- SF Bay RMP phased approach

Representative vs. comprehensive sites

- PFAS Investigation Order
 - SF Bay Area wastewater response uses a regional, representative study design



Practical Considerations: Informing Management

Key questions

- What management actions are possible?
- What data gaps must be filled to inform management decisions?
- What is the minimum science needed?

Final Thoughts

- Growing body of targeted CECs data in California
- EcoPanel strategy can guide use of limited resources for monitoring and management
- Regions vary with respect to:
 - Data richness, CECs expertise, industries, resources, local management opportunities
 - Prioritization can help regions to adapt recommendations for maximum impact

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Thank you