RMP
REGIONAL MONITORING PROGRAM FOR WATER QUALITY IN SAN FRANCISCO BAY

sfei.org/rmp

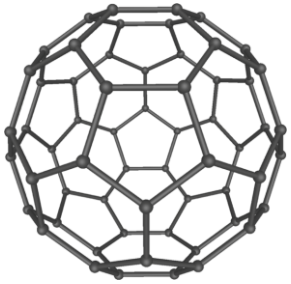
BACWA Hot Topics: Contaminants of Emerging Concern

Rebecca Sutton, Ph.D.

Contaminants of Emerging Concern

Pesticides

PFOS
PFAS



PBDEs &
Flame
Retardants

William Duke, NYTimes

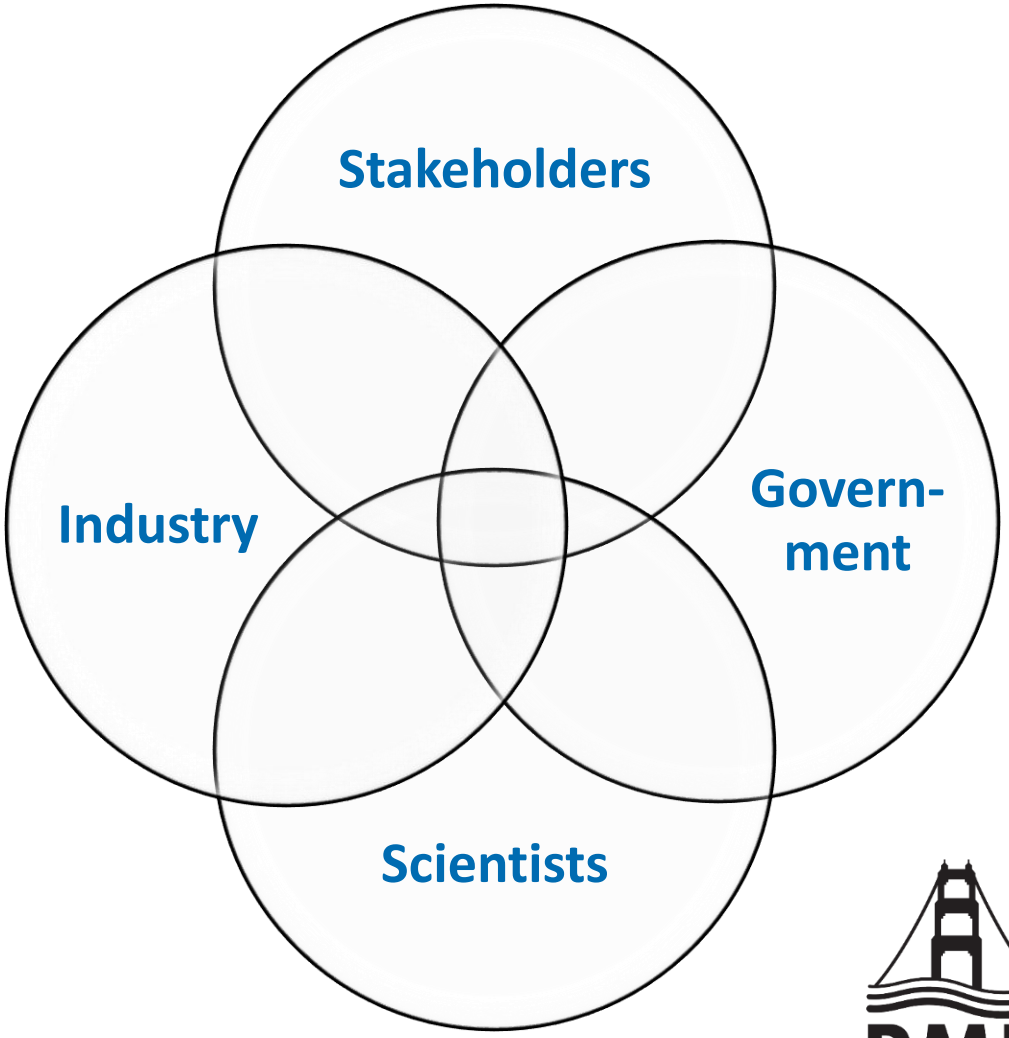
Regional Monitoring Program

Partnership to understand the **health** of San Francisco Bay

Implemented by

SFEI | AQUATIC SCIENCE CENTER

SAN FRANCISCO ESTUARY INSTITUTE & THE AQUATIC SCIENCE CENTER



RMP

RMP Focus on CECs

- 10+ years of monitoring and studies
  - Bay water, sediment, biota
  - Some wastewater and stormwater
- 2013 CEC Synthesis and Strategy
- 2017 Strategy Revision
- 2018 Pathways Monitoring Strategy

High Concern moderate or high impact	Bay levels above observed effects
Moderate Concern low impact	Bay levels above protective thresholds
Low Concern limited impact	Bay levels below protective thresholds
Possible Concern uncertainty as to impact	Uncertainty Insufficient data

RMP

High Concern moderate or high impact	None currently
Moderate Concern low impact	PFOS PFOA, Long-Chain Carboxylates Fipronil Alkylphenol Ethoxylates
Low Concern minimal impact	PBDEs and HBCD Pyrethroids* Pharmaceuticals Personal Care & Cleaning PBDDs / PBDFs
Possible Concern uncertainty as to impact	Alternative Flame Retardants Other PFASs (Fluorinated Chemicals) Pesticides, Plasticizers, Microplastic Siloxanes, SDPAs, UV-BZTs Rare Earth Elements, others

RMP

Current & Future Studies: Focus on Wastewater

- Pharmaceuticals (2018, proposed)
- Microplastics (ongoing)
- Ethoxylated Surfactants (2019)
- Sunscreens (proposed)

RMP

Pharmaceuticals

2016-2017 WWTP analysis:

- **7** BACWA facilities participated
- **104** pharmaceutical analytes
- BACWA & RMP coordination

2018 RMP Report:

- QA/QC review
- Synthesize data (anonymous)
- Comparison to thresholds of concern

RMP

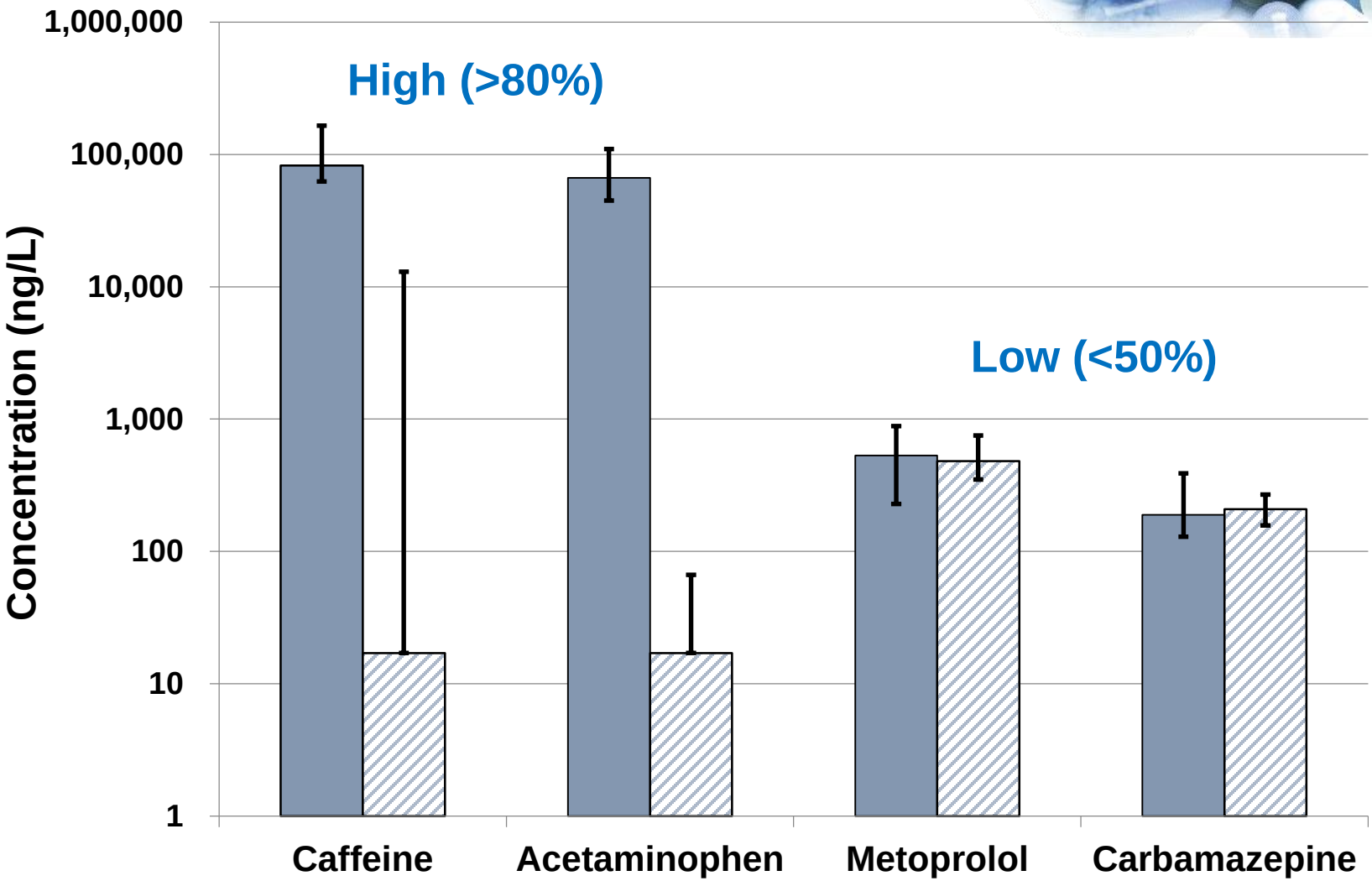
Pharmaceuticals: Major Findings

Across facilities:

- Influent loads similar
  - Top 5: metformin, caffeine, acetaminophen, ibuprofen, naproxen
- Effluent levels mostly similar
  - Top 5: metformin, valsartan, furosemide, hydrochlorothiazide, sulfamethoxazole

RMP

Pharmaceuticals: Major Findings



RMP

17 Priorities for Bay Study (proposed)

- **Antibiotics** – azithromycin, ciprofloxacin, clarithromycin, erythromycin, ofloxacin, sulfamethoxazole
- **Antidepressants** – amitriptyline, fluoxetine, sertraline
- **Anti-convulsant** – carbamazepine
- **Painkillers** – codeine, ibuprofen, oxycodone
- **Antihistamine** – diphenhydramine
- **Anti-diabetic** – metformin
- **Blood pressure** – metoprolol, propranolol

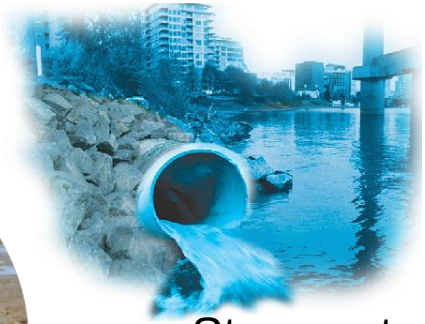
RMP

Microplastics

5 GYRES
SCIENCE TO SOLUTIONS

Pollution Pathways

Wastewater
(BACWA)



Stormwater

Bay Monitoring

Fish

Mussels

Marine Monitoring & Science

Sanctuary Samples

Transport Model

RMP

Microplastics & Microfibers in Wastewater

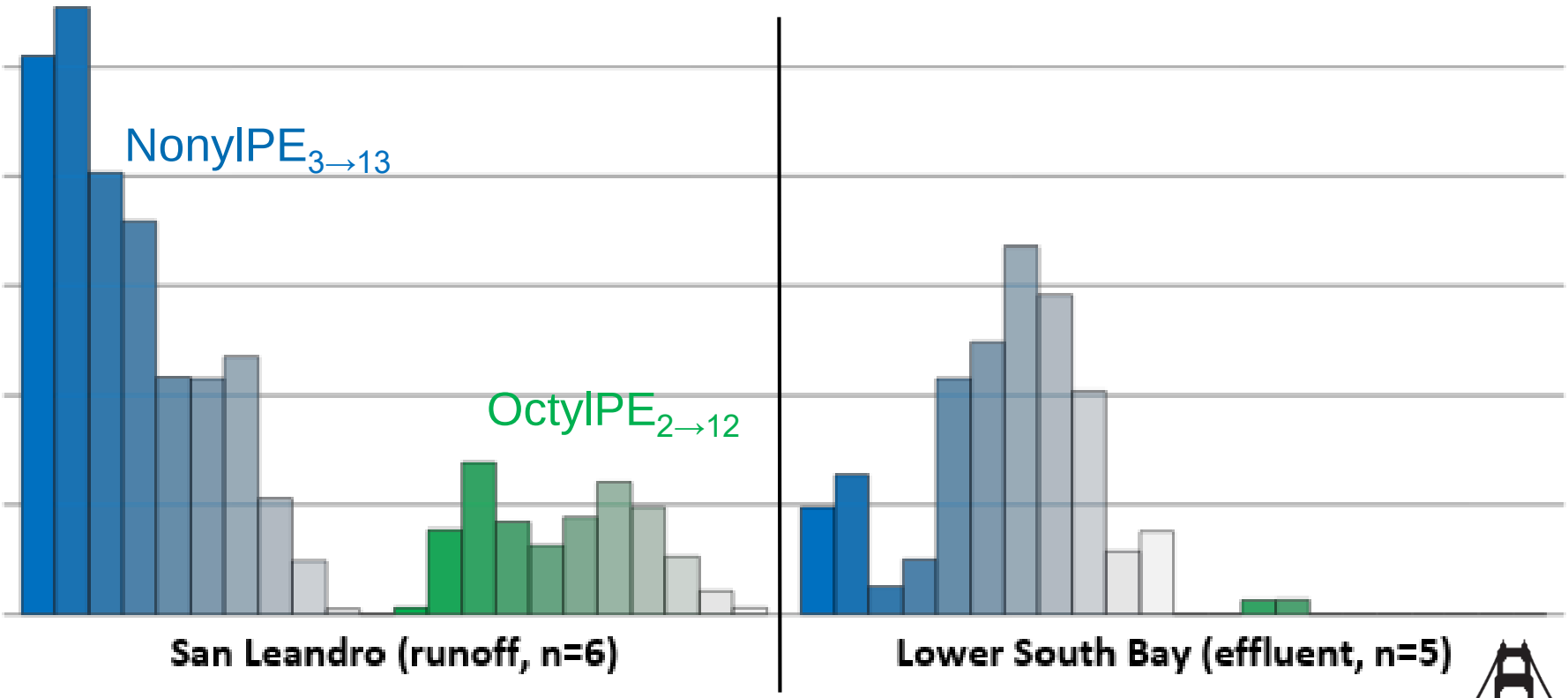
- **8 facilities:** Central San, EBDA, EBMUD, Fairfield Suisun, Palo Alto, SFPUC, San Jose Santa Clara, Sunnyvale
- **2 samples** per site
- **24 hour** composites
- Exploring effects of treatment, location, flow

RMP

Ethoxylated Surfactants

NEW!

Bay study suggests both urban runoff and effluent inputs



Uses: Detergent, cleaners, plastics, etc.

RMP

Sunscreens in Effluent (proposed)

NEW!

- Widely used in sunscreens, plastics, etc.
- Pathways to Bay
- Ecotoxicity concerns
- Endocrine disruption in fish

Opportunities for Engagement

- RMP Emerging Contaminants Workgroup Meeting: April 11-12
- BAPPG Meeting on CECs and PFAS: June 5

- BAPPG Meeting on Microplastics: April 3
- RMP Microplastic Workgroup Meeting: May 22
- Microplastic Symposium: October 2

- Volunteer to participate in studies!

RMP

Thank you

www.sfei.org/CECs

RebeccaS@sfei.org

Management Questions

- Which CECs have the potential to adversely impact beneficial uses in San Francisco Bay?
- What are the sources, pathways and loadings?
- What are the physical, chemical, and biological processes that may affect transport and fate?
- Have Bay concentrations increased or decreased?
- Are CECs predicted to increase or decrease in the future?
- What are the effects of management actions?

RMP

	Monitoring	Management
High Concern moderate or high impact	• Studies to support cleanup plan	• 303(d) listing • Cleanup plan (e.g., TMDL) • Aggressive control
Moderate Concern low impact	• Status & trends • Studies of fate, effects, sources, **pathways, loadings**	• Action plan • Aggressive pollution prevention • Low-cost control
Low Concern no impact	• Reduced screening in Bay; maintain S&T for two cycles • **Periodic screening in pathways, track trends**	• Low-cost source ID and control • Low-level pollution prevention • Track use trends
Possible Concern uncertainty as to impact	• Screening in water, sediment, biota, **wastewater, stormwater**	• Prioritize contaminants of potential concern, track other efforts • Develop analytical methods

High Concern moderate or high impact	None currently
Moderate Concern low impact	PFOS PFOA, Long-Chain Carboxylates Fipronil Nonylphenol
Low Concern no impact	PBDEs and HBCD Pyrethroids* Pharmaceuticals Personal Care & Cleaning PBDDs / PBDFs
Possible Concern uncertainty as to impact	Alternative Flame Retardants Other PFASs (Fluorinated Chemicals) Pesticides, Plasticizers, Microplastic Siloxanes, SDPAs, UV-BZTs Rare Earth Elements, others