

**State of California
Constituents of Emerging Concern
Coastal and Marine Ecosystems
Science Advisory Panel**

Panel Report Out

Meeting #3

**January 31 – February 1, 2011
Charleston, SC**

QUESTIONS TO BE ADDRESSED

- What are the relative contributions of contaminants of emerging concern (CECs) discharged into coastal aquatic ecosystems from wastewater and stormwater?
- What specific CECs, if any, are most appropriate for monitoring in discharges to coastal aquatic systems and what are the applicable monitoring methods and detection limits?
- How are these priority constituents affected by the chemistry, biology, and physics of treatment in wastewater systems, by discharge into and transport by coastal streams, rivers and estuaries, and as a result of mixing and dilution with receiving coastal and ocean waters?
- What approaches should be used to assess biological effects of CECs to sentinel species in coastal aquatic systems?
- What is the appropriate design (e.g. media, frequency, locations) for a CEC monitoring and biological effects assessment program, given the current state of the art?
 - What level of effects will be detectable with such a monitoring program and how will its sensitivity vary with investment?
- What concentrations of CECs or levels of biological effects should trigger further actions and what options should be considered for further actions?

PANEL OBSERVATIONS & OBJECTIVES

- **Charge questions are broad, complex and require a wealth of data to address definitively**
- **Schedule is very aggressive; allocated resources are finite and time available of panel members is limited**
- **Focus on CECs in wastewater and stormwater**
- **Panel will strive to**
 - Define a framework/process to address all charge questions
 - Apply the framework using existing, up to date information
 - Make recommendations to improve framework and fill data gaps

CONCEPTUAL APPROACH

- **Adopt risk-based framework developed by panel for recycled water applications**
 - MEC/MTL
- **Utilize existing wastewater effluent database(s)**
- **Build upon existing stormwater information**
 - supplement with second round of data collection
- **Distinguish between direct (dissolved) & indirect (particle reactive) exposure in fate and risk scenarios**
- **Identify appropriate (coastal/marine) eco-receptors, endpoints & tools**

Oceanic Sites

Exposure

Fate/Bioavailability

Toxicity

Q4

Q3

Sources

Q1

Q2

Point

POTW Discharge

- Domestic
- Industrial
- Brine
- DBPs

Nonpoint

Air Deposition

GW seepage

Stormwater*

FW-riverine-ocean*

•Log Kow >3

•“Pseudo-persistent ionics”

•Degradates

•Half-life

•BCF/BAF (trophic transfer)

•Population > Individual

•Chronic vs. Acute

•Repro > growth > survival

•Neuro-endocrine

•Immune

•Direct vs. Indirect

•Antibiotic Resistance

•Mixtures

•Predictive

Framework

Prioritize compounds using:

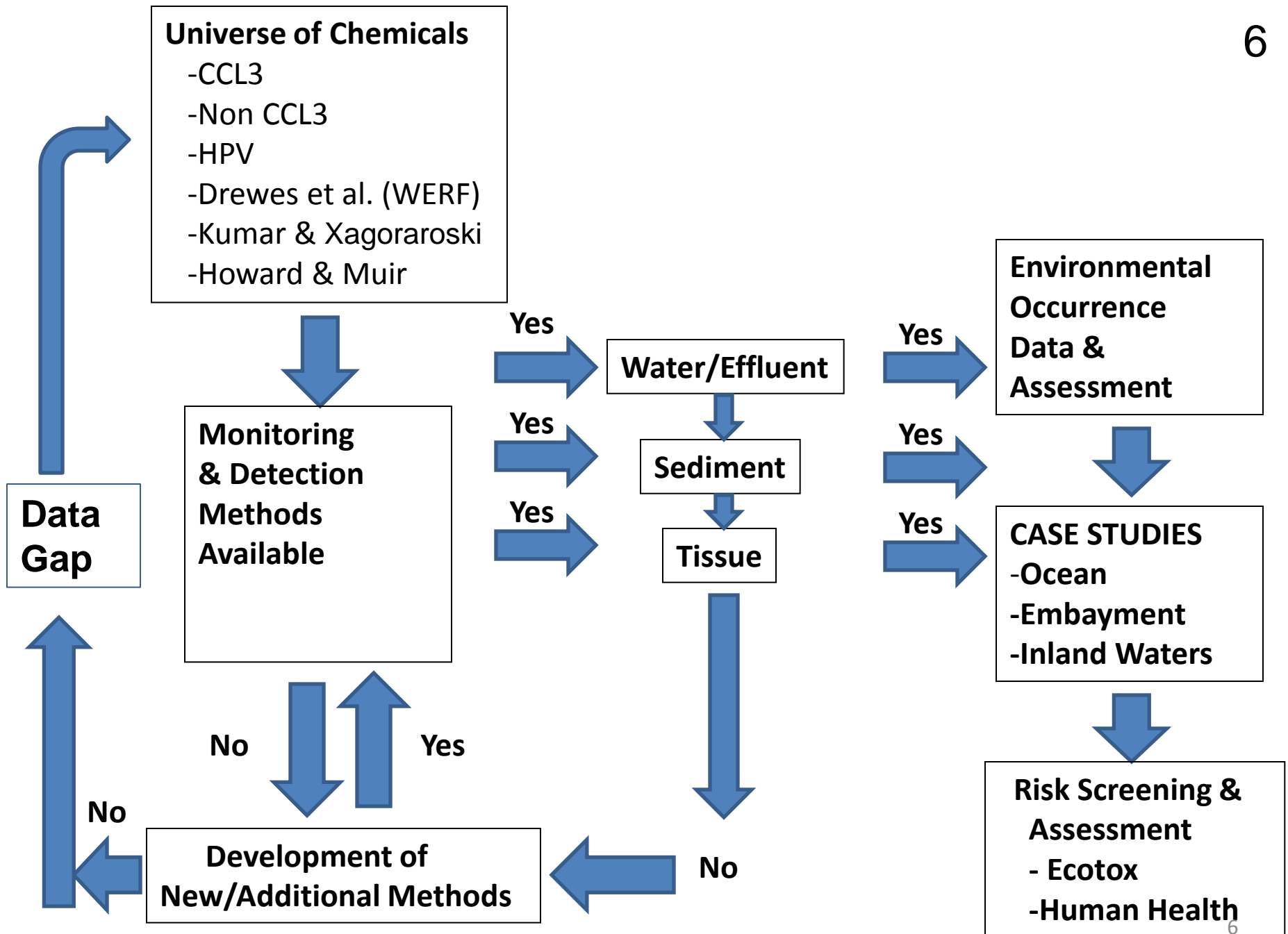
- each category for initial screening (CCl3)?
 - Subjective Ranking (1-5)
- WERF model/list?

Q5

Case Studies for confirmation?

- SAR
- OCSD/LACSD
- Bight studies

Q6



CASE STUDIES

- **Coastal ocean discharge**
 - Larger POTW discharging to mid-shelf (> 50 m)
 - Smaller POTW discharging nearshore (< 50 m)
- **Embayment receiving water**
 - stormwater input
 - variable freshwater input & oceanic connectivity
- **Inland receiving water (coastal river)**
 - wastewater effluent dominated system

DATA GAPS

- **Unknown knowns**
 - high potential for toxicity, little/no occurrence data
 - e.g. disinfection by-products
- **Unknown unknowns**
 - Little/no occurrence and tox info
 - technology development issue (bioscreening?)
- **Dissolved (operational) vs. particulate**
 - Inconsistent use of filtering for available data

PANEL TASKS

- **Populate occurrence database**
 - aqueous vs. particle/tissue
 - effluent vs. stormwater
- **Refine case study (exposure) scenarios**
- **Compile available toxicological (MTLs)**
- **Run the framework**
- **Consider data & technology gaps**

SCHEDULE

- **Two-year project to be completed Summer 2011**
- **Meeting #1: Jan 2010**
 - Defining/refining the charge
 - Stakeholder perspectives & identify short term data gaps
- **Meeting #2: Summer 2010**
 - Working meeting to address charge questions
- **Meeting #3: Winter 2011**
 - Working meeting to address charge questions
 - Submit draft report for public comment : June 2011
- **Meeting #4: ~~Spring~~ Summer 2011**
 - Consider public comments and revise draft report
- **Final report to SWB: September 2011**