

WELCOME TO THE CALIFORNIA MICROPLASTICS HEALTH EFFECTS WORKSHOP REPORT-OUT

- **The meeting will begin at 8:00**
- **Please contact Paul Smith (pauls@sccwrp.org) if you are having connection difficulties**
- **Attendees will be muted until the public question period**
 - Please use the Q&A box to communicate with the host if you have questions
- **This meeting will be recorded and placed on the SCCWRP web site**

BACKGROUND

- **California has legislative mandates for microplastics management**
 - SB 1422 requires implementation of routine drinking water microplastics monitoring by 2021
 - SB 1263 requires development of a Microplastics Management Strategy for the California ocean by 2022
- **These mandates require addressing several scientific holes**
 - Agreeing to a definition of microplastics (done)
 - Adopting standard methods for measuring microplastics, including accreditation (in process)
 - Developing a health effects construct for interpreting the data that will be collected
- **We held a virtual workshop over the last year to address that third need**
 - 20 top people in the field convened to develop scientific consensus
 - Started with online webinars last fall that 715 of you attended
 - Concludes today with a verbal report out of the workshop findings

WORKSHOP APPROACH

- **Workshop focused on three core questions**
 - What are the most important microplastic characteristics affecting biological response?
 - What are critical abundance thresholds at which ambient aquatic biota are affected?
 - What are critical thresholds at which humans are affected by microplastics in drinking water?
- **First developed a management construct**
 - What are the key management decisions and how many different thresholds are needed?
 - What is the appropriate philosophy surrounding each threshold?
- **Threshold values were then developed through meta-analysis**
 - Extract and combine response data from published studies into an integrated data analysis
 - Our last talk today will be about how you can access that data base

PARTICLE EFFECTS

- **There are several mechanisms for microplastics effects**
 - Food dilution, in which the animal feels a false sense of satiation
 - Translocation, where particles cross the digestive tract boundary and disrupt internal tissues
 - Entanglement, particularly by fibers with small planktonic organisms
 - Chemical/pathogen exposure from plastics/additives or contaminants that sorb to plastics
- **Workshop focused on the first two mechanisms**
 - Those are the mechanisms for which the most data are available
 - Assessing chemical hazards is challenging because of the diversity of chemicals and the high number of plastics with undisclosed chemical identities

LOTS OF DATA AVAILABLE

- **Ambient aquatic species**

- 165 *in vivo* studies and 2 *in vitro* studies
- 6,051 biological “measurements” involving 117 species
- 3 shapes and 14 polymers, ranging in size from 20nm to 5mm

- **Human health**

- 27 *in vivo* studies and 36 *in vitro* studies
- 3,904 “measurements”, with *in vivo* studies mostly performed with rodents
- 2 shapes and 8 polymers, ranging in size from 4nm to 447µm

- **However, there were considerable data quality concerns**

- The initial part of the workshop focused on developing quality screening criteria
- Led to elimination of about $\frac{3}{4}$ of the studies

TODAY'S SPEAKERS

- **Relative importance of different microplastic features on toxicological response (Chelsea Rochman)**
- **Management thresholds for ambient water (Alvina Mehinto)**
- **Management thresholds for drinking water (Scott Coffin)**
- **The TOMEX data base, now and into the future (Leah Hampton)**

QUESTIONS FOR OUR SPEAKERS

- **Ten minutes has been allocated after each talk for audience questions**
- **Please type your questions into the Q&A box**
- **If we have more questions than time, the speakers will try to answer your questions via written response in the Q&A box**

WORKSHOP PARTICIPANTS

Government

Elaine Khan – California Office of Environmental Health Hazard Assessment

Scott Coffin – California Water Resources Control Board

Holly Wyer – California Ocean Protection Council*

Anna-Marie Cook – US Environmental Protection Agency*

Sherry Lippiatt - NOAA*

Christine Lemieux – Health Canada

Leah Hampton – SCCWRP

Alvina Mehinto – SCCWRP

* Has subsequently retired or changed affiliation

Academia/other

Martin Wagner - Norwegian Univ of Science & Technology

Matt Cole - Plymouth Marine Laboratory

Ludovic Hermabessiere – University of Toronto

Allen Burton - University of Michigan

Ezra Miller – San Francisco Estuary Institute

Stephanie Wright - Imperial College London

Chelsea Rochman – University of Toronto

Bart Koelmans - Wageningen University

Susanne Brander – Oregon State University

Todd Gouin - TG Environmental

Hans Bouwmeester - Wageningen University