IDENTIFYING AND ADDRESSING CONTAMINANT SOURCES IMPACTING AN URBAN ESTUARY

ABSTRACT

Urban estuaries often harbor groundwater contamination with anthropogenic compounds in elevated exposures and impacts to wildlife. Proprietors, collaborators, and allied monitored monitoring of anthropogenic contaminants sources to inform effective, evidence-based control actions. The Regional Monitoring Program for Water Quality in San Francisco Bay (RMP) identifies and documents trends in contaminants of concern across a broad range of North America's estuaries. Its data on PBDEs, for example, reveals a strong collaboration among regulators, regulated entities, and independent scientists, with localized detection of contamination derived from consumer and industrial products before it causes major impacts to wildlife. This RMP develops and disseminates scientific information specifically related to sources identification and potential control actions on contaminants such as flame suppressants, plastic, and personal care products. Long-term monitoring that has allowed the RMP to track the recovery of the Bay following management actions, including chemical phase-outs and bans.

This presentation will summarize major challenges in pollution source identification and potential control actions on contaminants such as flame suppressants, plastic, and personal care products. Long-term monitoring that has allowed the RMP to track the recovery of the Bay following management actions, including chemical phase-outs and bans.

THE REGIONAL MONITORING PROGRAM FOR WATER QUALITY IN SAN FRANCISCO BAY (RMP) is a novel partnership between regulatory agencies and the regulated community (Trowbridge et al. 2016). This independent, long-term monitoring program provides the scientific foundation to manage the water quality of this vital urban ecosystem. For nearly 25 years, high quality scientific and special studies from the RMP has guided dozens of important decision about pollution prevention and control. The RMP regularly monitors water, sediment, biota, fish, and birds for a variety of legacy and emerging contaminants. To assist water quality managers in interpreting data and identifying the sources of contaminants, the RMP also funds special studies.

THREE EXAMPLES HIGHLIGHT RECENT RMP FINDINGS RELATING TO:

1. EARLY DETECTION

2. INFORMING SOURCE IDENTIFICATION

3. DEMONSTRATE IMPACTS OF CONTROLS

WHAT IS THE RMP?

The RMP is a collaborative partnership between regulatory agencies and the regulated community to develop and disseminate independent, long-term monitoring of anthropogenic contaminants. To address the need for improved information on sources, the RMP identifies and documents trends in contaminants of concern across a broad range of North America’s estuaries. Its data on PBDEs, for example, reveals a strong collaboration among regulators, regulated entities, and independent scientists, with localized detection of contamination derived from consumer and industrial products before it causes major impacts to wildlife. The RMP develops and disseminates scientific information specifically related to sources identification and potential control actions on contaminants such as flame suppressants, plastic, and personal care products. Long-term monitoring that has allowed the RMP to track the recovery of the Bay following management actions, including chemical phase-outs and bans.

EARLY DETECTION

PBDEs are flame retardant additives in a variety of consumer goods, including furniture, electronics, and personal care products (e.g., the pellet in FIGURE 1). For another example of RMP early detection, see Poster WP088, Stow et al. 2016). Clearly defined PBDE sources were identified in San Francisco Bay during 2015 (FIGURE 2), and the phase-out of these products in 2018.

INFORMING SOURCE IDENTIFICATION

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DEMONSTRATE IMPACTS OF CONTROLS

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Polybrominated diphenyl ethers (PBDEs) are flame retardant additives in a variety of consumer goods, including furniture, electronics, and personal care products (e.g., the pellet in FIGURE 1). For another example of RMP early detection, see Poster WP088, Stow et al. 2016). Clearly defined PBDE sources were identified in San Francisco Bay during 2015 (FIGURE 2), and the phase-out of these products in 2018.

INDEPENDENT SCIENCE NEEDS

What are the key pollution sources for emerging contaminants? Are these sources increasing or decreasing over time? How do we identify and quantify these sources? How do we inform key management decisions to reduce environmental contamination?

Microplastic, Including Microbeads

Microplastics are defined as tiny particles of plastic five micrometers or smaller, which enter the environment through human use. Personal care products with microbeads, synthetic clothing, plastic bags, polystyrene foam packaging, and diverse microplastic particles which enter the environment through human use. Personal care products with microbeads, synthetic clothing, plastic bags, polystyrene foam packaging, and diverse microplastic particles which enter the environment through human use. Personal care products with microbeads, synthetic clothing, plastic bags, polystyrene foam packaging, and diverse microplastic particles which enter the environment through human use.

Fate in the Bay

Fate of microplastic and PBDEs in the San Francisco Bay was characterized for PBDEs since 2002 (Sutton et al. 2015). Clearly defined PBDE sources were identified in San Francisco Bay during 2015 (FIGURE 2), and the phase-out of these products in 2018.

1. EARLY DETECTION

2. INFORMING SOURCE IDENTIFICATION

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