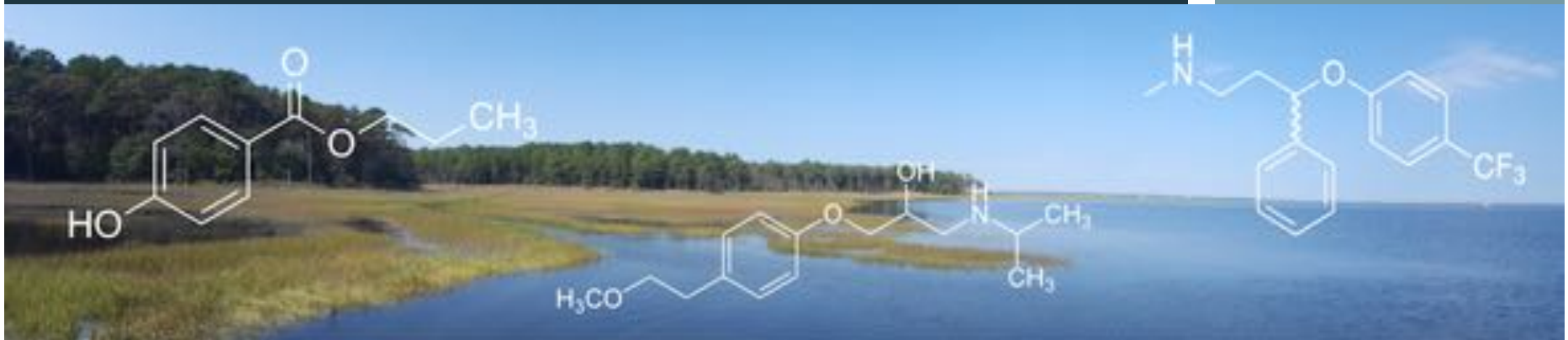


Emerging: Contaminants of Environmental Concern

March 13, 2017, 8:00 AM – 3:00 PM

Del Tech, Terry Campus (Dover, DE), Conference Center,
Education and Technology Building 727



ATTENDANCE

- **94 attendees (73 evaluation responses)**
 - **Government Agencies (33)**
 - USGS, Army Public Health Center
 - DNREC, DDA, DGS
 - Counties, Municipalities
 - **Academia – researchers and students (20)**
 - **Environmental Groups (9)**
 - **Industry (4)**
 - **Other (7)**
 - News Journal, Cape Gazette

AGENDA

- **Welcome by Emily Seldomridge and Secretary Small**
- **“Keynote” by Pat Phillips, USGS**
- **Monitoring (Ron MacGillivray, DRBC)**
- **Environmental thresholds (Kelly Smalling, USGS)**
- **Regulation of contaminants (Keith Harrison, DE ODW)**
- **Treatment technologies (Tom Schueler, CSN)**
- **Effects of contaminants on horseshoe crabs (Danielle Dixon, UD)**
- **Microplastics (Jonathan Cohen, UD)**
- **Estuarine acidification (Bill Ullman, UD)**
- **Exposure to legacy and EC of ospreys (Barnett Rattner, USGS and Thomas Bean, UMD)**

CONTAMINANTS OF CONCERN

- Pharmaceuticals
- Personal care products
- Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)
- Polybrominated Diphenyl Ethers (PBDE) [flame retardants]
- Phytoestrogens
 - Occur naturally, released by plants (ex: red clover)
 - We have changed the landscape and concentrated certain plants
- Sun screen (oxybenzone)
- Microplastics (< 5mm)
 - Primary – manufactured small
 - Secondary – fragments of larger plastic debris
- Protons (coastal and estuarine acidification)
- *Many of the above detected in/around Delaware*

MONITORING AND REGULATION

- The DE Office of Drinking Water oversees public systems
 - ≥ 15 service connections or serves > 25 people 60+ days/year
- Standard parameters routinely collected (coliform, nitrates, chlorine, iron, pH)
- EPA publishes Contaminant Candidate List (CCL) every 5 years
- Data collected through the Unregulated Contaminant Monitoring Rule (UCMR)
 - In 2013-2015, public water systems were sampled
 - 701 contaminants detected in DE
 - 2018-2020 next round
- EPA uses data to make a regulatory determination on at least 5 contaminants on the list
- A maximum contaminant level (MCL) and maximum exposure guidelines get released
- Data posted in the National Contaminant Occurrence Database

BMPs

- **Urban stormwater BMPs generally very good at removing urban toxic contaminants**
 - Most have sediment-like properties
 - Accumulation in BMP sediments over time; ok?
- **Shift to conservation tillage has changed herbicide usage**
 - Still routinely detected in surface waters, rarely detected in groundwaters, aquatic life criteria not exceeded
- **Biogenic hormones being phased out of animal feeding operations due to social messaging on food quality and safety**
 - Buffers, wetland, lagoons effective at removing in runoff
- **Also phasing out routine use of antibiotics**
 - No conventional BMPs remove antibiotics; very persistent, hydrophilic, and soluble; can degrade soil microbial communities and reduce denitrification rates when waste land applied

RESEARCH NEEDS

- Fate/transport,
 - All media (water, sediment, & tissue) to understand total exposure
 - Seasonality, storms
 - Groundwater lag time an issue for these chemicals too
- Effects
 - Some species more sensitive than others, even within taxa
 - Very small amounts (nanograms/liter) can have a biological effect
 - Subcellular responses observed in minutes/hours; cellular in hours/days; organisimal in weeks/months; population in years/decades
- Inter-relationships (cocktails)
- Are replacements / alternatives safer?
- *“Emerging concerns related to known contaminants”*

OTHER NEEDS

- **Communication to public about**
 - These contaminants,
 - Their sources,
 - Pathways,
 - Potential impacts
- **Social movement to drive alternatives, bans**
 - Consumer choice decisions
- **Citizen scientists to collaborate on microplastics**

EMERGED ONLINE

- <https://www.inlandbays.org/events/emerged-symposium/>
- Agenda
- Speaker Bios
- Presentations and Posters
 - (No USGS presentations allowed; working on getting abstracts posted instead)

WHAT'S NEXT?

- **Most relevant information for Inland Bays?**
- **What follow up should be done?**
- **Research priorities?**
- **Recommendations?**