

DIY: Clean and Green

Arapahoe County Library Workshop
Centennial
April 2013



CONTAMINANTS OF
EMERGING CONCERN



Presenters

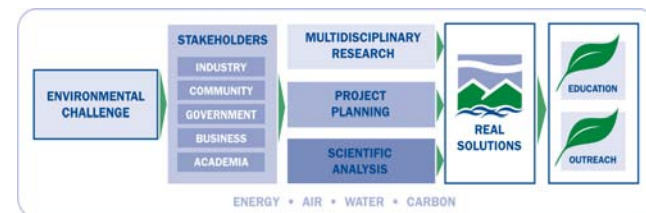
- **Carol Lyons**, Executive Director
- **Patrick DePriest**, Project Manager
- **Andrea Stucky**, Project Intern
- **Bridgette Haggerty**, Project Intern

Agenda

- Introduction to IES
- Presentation on CECs in household products
- Make your own products
- Questions and answers
- Survey

Introduction to IES

The Institute for Environmental Solutions (IES) is an independent non-profit organization that engages stakeholders to deliver technically sound solutions to complex environmental and health problems -- without unwanted side effects.





CECs in Boulder Creek/CECs in Colorado

University of Colorado study of white sucker fish populations downstream from wastewater treatment plant in Boulder, CO


Findings:

- Gonadal intersex
 - 18-22% of population downstream, compared to upstream
- Altered sex ratio
 - Half the number of males downstream compared to upstream; female bias
- Decrease in gonad size
- Water sampling showed mixture of endocrine-active chemicals
 - Estrodial
 - Ethynylestradiol
 - Alkylphenols
 - Bisphenol A (BPA)

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Contaminants of Emerging Concern: What are they?



Chemicals in everyday household products:


- Personal care products
- Cleaning products
- Packaging and food preservatives

Examples of CECs
Triclosan, triclocarban, DEET, surfactants, synthetic fragrance, bisphenol A (BPA), BHA, parabens, benzophenone, caffeine, atrazine

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CECs : Where are they?

- **Increasingly found in water systems.**
- Originate from industrial and household cleaning products, personal care products, food packaging and pharmaceuticals
- **Uses of CECs:** plasticizer, food preservative, antimicrobial/antibacterial agent



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Why do we care?

- **Not regulated**
- Conventional wastewater treatment does not target or effectively remove
- Low-dose, long-term exposure
- Individual actions of people can make a difference
- Problem is unique: Preventable pollution
- Marketing plays a large role




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Potential health risks of CECs

- **Interfere** with endocrine systems and disturb development
- **Known or suspected** toxins and endocrine disruptors
- **Suspected of** causing cancer or can contribute to increased risk from other carcinogens



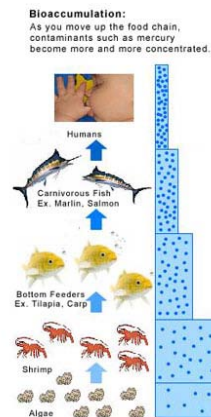
Health risks of CECs uncertain

- Chemicals tested on animals at high doses; results extrapolated to predict response at low doses
- Many risk assessments used by the government based on these older tests
- More recently discovered that some chemicals can have a larger effect at a lower dose
A 2006 study in the Chesapeake Bay found that 100% of male bass were intersex (both gonads) due to estrogenicity of the water

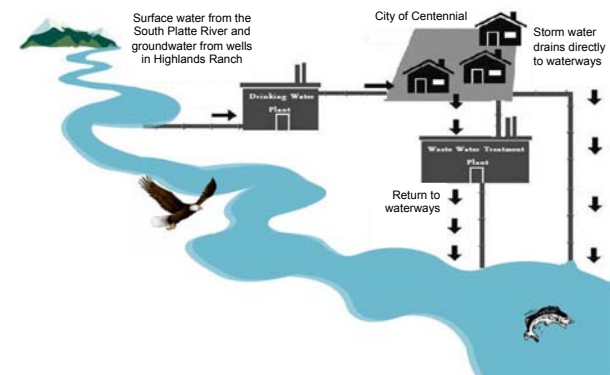
Environmental Impacts

Bioaccumulation

- Known to bioaccumulate in fatty tissues in humans and in wildlife (accumulate in increasing concentrations as they move up the food chain).
- Cause deformities: exposure linked to mutant fish



Water Cycle



CECs and household cleaning products

Sources and destinations


- **Sources:** household and personal care products, food products, pharmaceuticals, flame retardants, pesticides
- **Treatment:** wastewater treatment is not designed or required to remove CECs
- **Persistent:** contaminants build up in the environment (including our homes)




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CECs in household products: Triclosan and triclocarban


- **What are they?**
Compounds added to many products to reduce or prevent contamination by bacteria and fungi.
- **What products have it?**
Antibacterial hand soaps, dishwashing detergents, laundry soaps, and toothpaste
- **What's the harm?**
 - A 2002 Geological Survey showed triclosan as top detected contaminant in waterways
 - Poses health risks to wildlife: hormones, thyroid disorders, endocrine disruptor
 - Poses health risks to humans: bacterial resistance, human breast milk
 - Bioaccumulation greatly increases the dangers of triclosan in the environment
- **Safe alternatives:**
 - Avoid all products that contain triclosan
 - Proper hand washing for 10-15 seconds with any soap
 - Triclosan and triclocarban are listed as ingredients on labels



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CECs in household products: Synthetic fragrance (perfume, parfum)


- **What is it?**
Synthetic fragrances are organic compounds used in almost commercial fragrances
- **What products have it?**
Air fresheners, cosmetics, soaps, cleaning products, and care products
- **What's the harm?**
Poses health risks to humans and wildlife: persistence in the environment, accumulation in tissues, breast milk
- **Safe alternatives:**
Use unscented products or products scented from organically grown natural plants, and essential oils
- **Regulation and label requirements:**
FDA regulates fragrance in cosmetics, but there is no regulation for cleaning products and other household products



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CECs in household products: Surfactants

- **What are they?**
Surfactants are organic compounds commonly called wetting agents because they reduce surface tension in water and other liquids
- **What products have it?**
Soaps, dishwashing liquids, laundry detergents, fabric softeners, shampoos
- **What's the harm?**
 - Increase level of estrogen in organisms
 - Decrease in testicular size and sperm count in test animal
- **Safe alternatives:**
 - Avoid products with surfactants listed on the label
 - Choose products with plant-based surfactants
 - Regulation and label requirements:
 - None
- **Regulated in the UE but not in the United States**



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CECs in household products: BPA (Bisphenol-A)





- **What is it?**
BPA is a plasticizer that is used to strengthen and harden plastics and provide temperature resistance
- **What products have it?**
Aluminum beverage cans, canned foods, plastic food containers, water bottles, plastic beverage containers, plastic food wrap, and in thermal paper (receipts event tickets)
- **What's the harm?**
 - Endocrine-related effects were found in fish, aquatic invertebrates, amphibians, and reptiles (Environment Canada, 2008)
 - Human studies suggest that BPA can cause hormonal changes
 - Detectable in 95% of Americans, with the highest levels occurring in children and infants (an Environmental Science & Technology study, 2010)
- **Safe alternatives:**
 - Avoid products packaged in BPA-containing materials: prefer food that is packaged in glass, polypropylene, polyethersulfone, PVC, polyamide, silicone, or tritan copolyester
 - To avoid BPA exposure from thermal paper, choose to have receipts and event tickets e-mailed so they can be printed at home.

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What do we do about CECs?

- **Educate** yourself, your family, and your friends
- Make inexpensive and safe non-toxic **alternative products**
- **Read the labels** of products before you buy
- Buy products that do not contain contaminants in their contents or packaging
- Buy **fresh and bulk food** rather than canned or packaged
- **Buy, use, and re-use** CEC-free bottles and food containers
- **Encourage** stores and industries to use safer alternatives

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Make your own non-toxic cleaning products

Spray Bottle Recipes

- All-purpose cleaner
- Shower cleaner
- Glass cleaner
- Wood cleaner



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Questions and Answers

For more information sign up for the IES quarterly e-newsletter
Newsletter@i4es.org

Thank You!

Team members:
Carol Lyons, Patrick DePriest, Andrea Stucky,
Bridgette Haggerty, Elodie Boucher, Danielle Matthews

Contact:
www.i4es.org
Solutions@i4es.org
Carol Lyons, Executive Director
303-388-5211

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