Non-Toxic Cleaning and Living

University Hills Optimist Club
Denver
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Institute for Environmental Solutions

CONTAMINANTS OF EMERGING CONCERN

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Presenters

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Agenda

- Introduction to IES
- Introduction to CECs
- Denver water cycle
- Demonstration of home-made cleaning products
- Questions and answers

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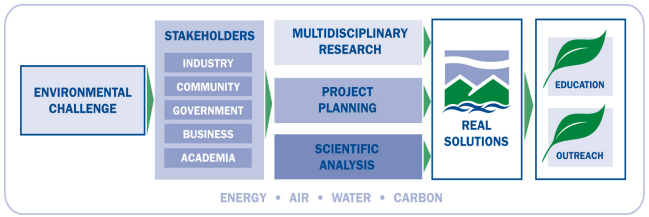
Introduction to IES

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.



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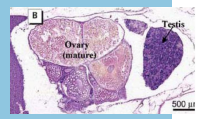
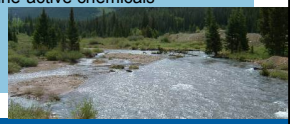
CECs in Boulder Creek/CECs in Colorado

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)





Contaminants of Emerging Concern: What are they?

Chemicals in everyday household products:

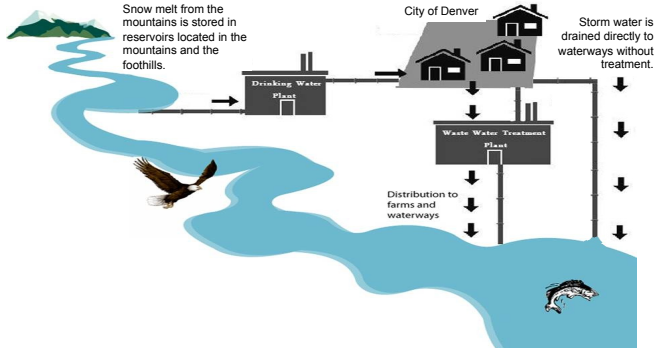
- Personal care products
- Cleaning products
- Packaging and food preservatives

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

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

Denver Water Cycle



Why do we care?

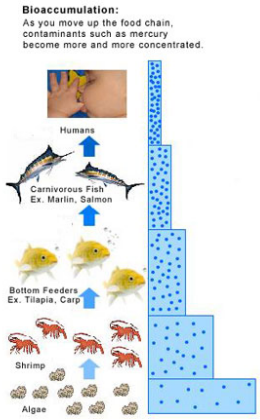
- **Not regulated**
- Conventional wastewater treatment does not target or effectively remove
- Low-dose, long-term exposure
- Individual actions of people can make a difference
- Problem is unique: Preventable pollution
- Marketing plays a large role

CECs: Potential Health Risks

- Health risks
  - Interfere with endocrine system
  - Interfere with development
  - Suspected toxins and carcinogens
- Research limitations
  - Chemicals tested on animals and not humans
  - Use of dose-response curves to extrapolate
  - Few long-term studies
- U.S. government says studies merit further research, not regulation

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



CECs in Household Products: Triclosan and Triclocarban

- **What are they?**
  They are compounds added to many products to reduce or prevent conta by bacteria and fungi.
- **What products have it?**
  Antibacterial hand soaps, dishwashing detergents, laundry soaps, and t
- **What's the harm?**
  - A 2002 Geological Survey showed triclosan as top detected contaminant 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

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

Product Demonstration: All-purpose Cleaner

Ingredients and Supplies:

- Spray bottle
- Measuring spoon (teaspoon)
- Liquid measuring cup
- 12 ounces (1 ½ cups) hot water
- 1 teaspoon liquid soap or 1 teaspoon borax
- 1 teaspoon white vinegar or 1 teaspoon lemon juice

Directions:

- Fill spray bottle with 12 ounces hot water.
- Mix with 1 teaspoon of liquid soap or borax.
- Add 1 teaspoon of white vinegar or lemon juice to cut grease.
- Shake bottle gently to dissolve minerals.

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 EU but not in the United States**

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
- **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.

What do we do about CECs?

- **Educate** yourself, your family, and your friends
- **Reduce** your chemical footprint
- 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

Questions and Answers

For more information sign up for the IES Quarterly E-Newsletter

Newsletter@i4es.org

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Thank You!

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