



# Our Community-Our Chemistry- Our Environment

April, 2017

*Citizens, government and industry working to promote public understanding and involvement in chemical risk management.*

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## 2017 Quarterly Meeting Schedule

We look forward to providing relevant and informative presentations to our members each year as well as provide meaningful networking opportunities. We have decided to use a quarterly meeting format this year to enrich our meeting experience. We currently invite you to our May meeting with the following agenda:

May 18<sup>th</sup>, 8:00am-10:30am Interact for Health (Breakfast/Coffee provided)  
Speakers: Kevin McMurray & Chris Kahn, Attorneys Frost Brown Todd  
Topic: RMP (Risk Management Plans), and Next Generation Compliance.

Speaker: Rob Paxton, Shepherd Chemical  
Topic: A Mesocosm study / Understanding Environmental Impacts

Speaker: Ryan Grafton, MSD's Sewer Rehabilitation Program  
Topic: Selenium as related to the Iron Ore Mining Industry

## Ohio Materials Marketplace

DEFA has launched a new online network. The [Ohio Materials Marketplace](#) is an online network designed to facilitate cross-industry materials reuse among Ohio companies and organizations. The marketplace aims to create a closed-loop, collaborative network of businesses, organizations and entrepreneurs where one organization's hard-to-recycle wastes and by-products become another organization's raw material. In addition to diverting waste from landfills, these recovery activities generate significant cost savings and create new jobs and business opportunities. Participation is open to any company or organization with operations in Ohio.

[Apply today to join the Ohio Materials Marketplace.](#) If you have questions or need assistance with the form, please contact [Joseph Klatt](#).

## Community Happenings

City of Cincinnati offers curbside textile recycling. [Learn more:](http://www.cincinnati-oh.gov/recycling/textile-recycling/)

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### DRONES FOR EMERGENCY RESPONDERS.

We had 165 attend our Aug. 10, 2016 seminar: PowerPoints / videotaped <http://ceas.uc.edu/aerospace/FireScience/uav.html>

New course – May 1-5, 2017

This newsletter is your newsletter and we believe this will be an excellent forum for you to share project success stories reflective of your effort for and concerns about the environment and safe handling practices. Please reach-out to [heatheralessandro@gmail.com](mailto:heatheralessandro@gmail.com) or any of our Steering Committee Members with your suggestions for success stories, items of interest, safety or sustainability projects and other information you would like to share in the ACS Newsletter. We welcome your input.

## Endocrine Disrupters

There has been a great effort in the last few decades to identify toxic substances and prevent them from getting into the environment where they can cause harm. We now have thousands of synthetic chemical compounds in our world that our grandparents and great grandparents never encountered. Most are benign but some have been found to cause harm. The list is long and includes heavy metals like lead, pesticides like DDT, and agricultural chemicals like ALAR. Unlike lead, a lot of these toxic substances are not found in nature but instead are made by man. In the last decade or so attention has been focused on a group of chemicals called endocrine disrupters. Endocrine disrupters are typically synthetic chemicals that, at very low doses can interfere with the **endocrine** (or hormone) system. These disruptions can cause cancerous tumors, birth defects, and other developmental disorders. They can be found in the food we eat, the water we drink and the products we use every day.

For example, you may have seen some plastic products labeled, “BPA FREE”. BPA stands for Bisphenol-A. It’s commonly used as a plasticizer to make plastic products such as bottles and toys more flexible. It’s also a component of some epoxy coatings used to line the inside of food cans. Unfortunately BPA has been identified as an endocrine disruptor, and numerous studies have found that laboratory animals exposed to low levels of it have elevated rates of **mammary and prostate cancers**, decreased sperm count, reproductive problems, early **puberty** onset, **obesity**, and neurological problems.

There are many problems when dealing with endocrine disrupters. They can affect people at very low concentrations, sewage treatment plants are not designed to treat them, and it’s expensive to install systems to eliminate them from drinking water. Why mention sewage treatment plants? It’s because humans are one of the sources of these chemicals. For example, birth control pills contain synthetic estrogens such as ethinylestradiol. After such chemicals are excreted, they enter a sewage treatment plant and pass straight through to the environment because waste treatment facilities are not designed to treat them. Eventually they are discharged to what may be the source of our drinking water like the Ohio River. It’s been suggested the early onset of puberty in girls may be linked to the presence of these synthetic estrogens in public water supplies.

Recently, unexplained mutations have started to show up in certain fish and amphibian species. Endocrine disrupting chemicals are suspect but and could be a possible cause but that’s yet to be proven. Because these chemical substances are present in only minute quantities in the water, establishing a “cause-effect” relationship for these micro-pollutants is a difficult task. Some in the scientific community believe there is little evidence the degree of exposure in humans is enough to warrant concern while others believe these chemicals pose some degree of risk to human health. We’re fortunate in Cincinnati because the Waterworks uses an activated carbon system that can remove synthetic estrogens from our drinking water. In 1998 the EPA announced the Endocrine Disruptor Screening Program by establishing a framework for priority setting, screening and testing more than 85,000 chemicals in commerce. More research and better product testing will help eliminate or at least reduce our exposure to endocrine disrupters.

## The Use of Mesocosms in Ecological Risk Assessment



A mesocosm is an experimental system that examines the natural environment under controlled conditions. In this way mesocosm studies provide a link between field surveys and highly controlled laboratory experiments. These systems generally are aquatic, tend to be medium-sized to large and contain multiple trophic levels of interacting organisms.

In contrast to laboratory experiments, mesocosm studies incorporate natural organisms and vegetation. Mesocosm studies may be conducted in either an enclosure that is small enough that key variables can be brought under control or by field-collecting key components of the natural environment for further experimentation. Mesocosms can also be constructed outdoors in specifically designed cells with defined boundaries.



Extensive mesocosm studies have been conducted to evaluate how organisms or communities might react to environmental change, through deliberate manipulation of environmental variables, such as increased temperature, dissolved oxygen, carbon dioxide, pH levels and various concentrations of toxins. Mesocosms are useful for studying the fate of pollutants in marine environments as well as providing the ability to conduct controlled manipulative experiments that could not be undertaken in natural marine environments.

Data derived from mesocosm studies are usually required by regulatory agencies to set concentration limits and approval for use. In this way mesocosms have become a very important tool in ecological risk assessment.

The most important aspect of a mesocosm is that it truly represents the ecological environment. Since environments vary from one surface water to another, it is not uncommon to conduct multiple studies. The environment may be still like a pond or lake or it may be fluid and dynamic such as a river. Bottom sediments differ as do the properties of the water, i.e; pH, alkalinity or hardness, DOC (dissolved oxygen content) and others.

It usually takes up to 60 days to build a mesocosm that represents the environment in order to allow organisms to grow naturally and populate the mesocosm. An environmental change or toxin is then introduced into the environment over a period of approx. 30 days. The change in aquatic life is then measured. During these periods it is important that the environment is maintained and requires routine attention. An unintentional change may render the test results invalid.

Come to the May Alliance for Chemical Safety Meeting to hear about a specific mesocosm designed to measure the impact of cobalt in aquatic freshwater environments.