Dragonfly Gazette

GEORGIA PROJECT WET Environmental Protection Division

Spring 2011

IN THIS ISSUE:

ON the WEB:

Links, Lessons, and information about Pharmaceuticals in our Water

Your Project WET State Coordinators

Jo Adang

Sue Sturges

Monica Kilpatrick

Drugs in OUR water?

Pharmaceuticals such as antibiotics, anti-depressants, birth control pills, seizure medication, cancer treatments, pain killers, tranquilizers and cholesterol-lowering compounds are developed to make us healthier and fight disease, right? Well, yes, but they have also been detected in our water sources!

Where do they come from? Pharmaceutical industries, hospitals and other medical facilities are not the only sources. Believe it or not, households contribute a significant share. People often dispose of unused medicines by flushing them down toilets, and human excreta can contain incompletely metabolized medicines.

These drugs can pass intact through sewage treatment facilities, into waterways, lakes and even aquifers. Or they can end up at dumps and land fills, and if there is a problem with the protective liner, pose a threat to underlying groundwater.

Farm animals also are a source of pharmaceuticals entering the environment, through their ingestion of hormones, antibiotics and veterinary medicines. Manure containing traces of such pharmaceuticals is spread on land and can then wash off into surface water and even percolate into groundwater.

What other products are entering our water? Personal care products (cosmetics, toiletries or fragrances) are also showing up in water.

- **nitro musks**, used as a fragrance cause concern because of their persistence and possible adverse environmental impacts.

- **sun screen agents** have been detected in lakes and fish.

The amount of pharmaceuticals and personal care products entering the environment annually is about equal to the amount of pesticides used each year. Scientists claim that the amount will increase as new drugs are introduced each year and the *human genome project* may have something to do with it. Identifying many new genetic receptors for innovative pharmaceuticals may produce whole new classes of drugs that can enter our water.

It has taken a long time for attention to be given this threat. Twenty years ago, EPA scientists found that sludge from a U.S. sewage-treatment plant contained excreted aspirin, caffeine and nicotine. At the time, no significance was attached to the findings.

What's the risk to humans or wildlife? Scientists are concerned that many of these drugs have the potential of interfering with hormone production. To some scientists the release of antibiotics into waterways is particularly worrisome. They fear the release may result in drug-resistant disease-causing bacteria.

Scientists generally agree that aquatic life is most at risk, its life cycle, from birth to death, occurring within potentially drug-contaminated waters.

What can we do about it?

Jennifer McCoy, from Cobb Co. Water Authority, recommends the following for the disposal of medications: empty pills in a zip lock bag and mix with liquid detergent until the pills dissolve. Discard in trash. This way drug abusers can't ingest the pills. Many communities hold pharmaceutical clean-up days and some police departments have incinerators for disposing of drugs. The other option for discarding medications is to take them to your local hazardous waste facility.

Project WET Activity Suggestions

A. Try ***Water Bill of Rights*** to develop a plan for protecting our water from this problem. Students may discover a need for the following actions from government:

1. The federal government should fund and conduct a national study that provides risk assessments for pharmaceuticals in our waters and measures the potential human and aquatic health effects.
2. The federal government should enact a comprehensive national "take back" prescription drug protocol so people aren't tempted to flush unused medications.
3. Municipal water supply managers, should test for pharmaceuticals in tap water and watersheds that supply drinking water, and those results should be made available to the public.

B. Use ***Water: Read all about it!*** to produce a student-researched newsletter or website on this issue.

Visit GAProjectWET.org for more links, articles, and activities related to Pharmaceuticals in OUR water.

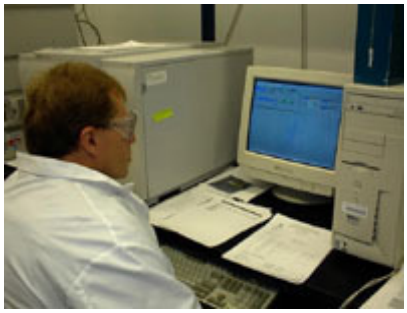
DRAGONFLY EXTRA

Building on the current issue with more information for Educators

Link to Paddle Georgia

USGS Scientists Develop New Method to Measure Pharmaceuticals in Water

U.S. Geological Survey (USGS) scientists have developed a new laboratory method to measure trace levels of 22 human-health pharmaceuticals in surface and ground water. The new method is a part of the Toxic Substances Hydrology Program's effort to document the sources, occurrence, fate, transport, and ecological-health effects of selected human and animal-health pharmaceuticals and other emerging contaminants in the environment. The powerful capabilities provided by this new method, developed as an integral component of the Emerging Contaminants in the Environment Investigation, enable scientists to delve deeper into the detailed scientific questions regarding the sources, fate, and effects of emerging contaminants in our environment.



U.S. Geological Survey scientist examining results of chromatographic analysis.

More Information

- Analytical Methods Development for Emerging Contaminants
- Organic Geochemistry Research Group
- Emerging Contaminants in the Environment Investigation

Related Headlines

- Do Combined Sewer Overflows Increase or Decrease Wastewater-Related Chemicals in Receiving Waters?
- Hormones Degrade in the Environment!
- Antidepressants in Stream Waters! Are They in the Fish Too?
- Manufacturing Facilities Release Pharmaceuticals to the Environment
- Measuring Antidepressants, Fungicides, and Insecticides in the Environment
- Detergents in Streams May Just Disappear
- Emerging Contaminants Targeted in a Reconnaissance of Ground Water and Untreated Drinking-Water Sources
- Biosolids, Animal Manure, and Earthworms: Is There a Connection?
- Household Chemicals and Drugs Found in Biosolids from Wastewater Treatment Plants
- Endocrine Disruption Found in Fish Exposed to Municipal Wastewater
- Pharmaceuticals Found in Soil Irrigated with Reclaimed Water
- Are Pharmaceuticals in Your Watershed? Understanding the Fate of Pharmaceuticals and Other Contaminants in Watersheds
- Tracing Wastewater - Using Unique Compounds to Identify Sources of Contamination
- USGS Scientists Contribute to New Book on Pharmaceuticals in the Environment
- Developing Methods to Measure New Contaminants in Aquatic Environments

- Glyphosate Herbicide Found in Many Midwestern Streams, Antibiotics Not Common
- National Reconnaissance of Pharmaceuticals, Hormones and Other Organic Wastewater Contaminants in U.S. Streams is Making an Impact
- "National Reconnaissance of Pharmaceuticals, Hormones, and Other Organic Wastewater Contaminants in Streams" Named as One of the Top 100 Science Stories of the Year

EPA Report: Pharmaceuticals and Personal Care Products as Pollutants
http://www.epa.gov/ppcp/

USDA National Organic Program (NOP) definitions:
http://www.ams.usda.gov/nop/NOP/standards/DefineReg.html

NSF Drinking Water Fact Kit:
http://www.nsf.org/consumer/newsroom/fact_water_pharmaceuticals.asp

SMARTRx DISPOSAL™
A Prescription for a Healthy Planet