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EDITORIAL COLUMN

By Joe Boswell

USGS research is GeoHealth's guiding the attention of a different customer base including policy makers, and the public at large. Dr. Dana Kolpin, Dr. Michael Focazio, and Dr. Herb Buxton, from the Texas Water Science Biology Program, Water Quality Research Committee of Ohio, and the opening phrases among the contributions to the Spotlight on Section, "Pharmaceuticals, Hormones, Personal Care Products, and Other Organic Wastewater Contaminants in Biosolids Research Activities for the Environmental Health Research Team, Texas Water Science Biology Program." Dr. Michael J. Focazio, Dana P. Kolpin, and Herb Buxton, Pharmaceuticals, Personal Care Products, and Other Organic Wastewater Contaminants in Biosolids Research Activities for the Environmental Health Research Team, Texas Water Science Biology Program, Page 2 of this issue.

Recent decades have brought increasing concern about the presence of long-term exposures from natural and anthropogenic sources of chemicals, including pharmaceuticals, personal care products, and other organic wastewater contaminants. Although the potential for adverse effects on the environmental ecosystems or biological balance of humans and other organisms is a major concern, the potential for adverse effects on humans is of increased concern for potential adverse environmental and human health effects from exposure to these "emerging" contaminants. The need to understand the processes controlling the transport and fate of these contaminants is critical to the protection of human health and the environment. Many of these contaminants have been detected in surface water, groundwater, and in some instances, tap water. Furthermore, the possibility of synergistic effects from exposure to mixtures of these contaminants is a significant concern. The need for research to characterize the types of mixtures that are found in our water, air, and food is critical. The Spotlight on Section, Mosquito Ecology Research Activities, provides information and tools on emerging water quality issues and the ecology of mosquitoes, including their role in monitoring and surveillance of mosquitoes, the WNV and other mosquito-borne diseases, mosquito control research experiments, the research community, and the public. Mosquitoes are important vectors of many diseases and are an emerging water quality issue which is contributing to the

SPOTLIGHT ON:

FEATURE ARTICLE

Pharmaceuticals, Hormones, Personal Care Products, and other Organic Wastewater Contaminants in Biosolids Research Activities for the Environmental Health Research Team, Texas Water Science Biology Program

By Michael J. Focazio, Dana P. Kolpin, and Herb Buxton

Recent decades have brought increasing concern about the presence of long-term exposures from natural and anthropogenic sources of chemicals, including pharmaceuticals, personal care products, and other organic wastewater contaminants. Although the potential for adverse effects on the environmental ecosystems or biological balance of humans and other organisms is a major concern, the potential for adverse effects on humans is of increased concern for potential adverse environmental and human health effects from exposure to these "emerging" contaminants. The need to understand the processes controlling the transport and fate of these contaminants is critical to the protection of human health and the environment. Many of these contaminants have been detected in surface water, groundwater, and in some instances, tap water. Furthermore, the possibility of synergistic effects from exposure to mixtures of these contaminants is a significant concern. The need for research to characterize the types of mixtures that are found in our water, air, and food is critical. The Texas Water Science Biology Program Water Quality Research Committee is investigating information and tools on emerging water quality issues and the ecology of mosquitoes, including their role in monitoring and surveillance of mosquitoes and the WNV and other mosquito-borne diseases, mosquito control research experiments, the research community, and the public. Mosquitoes are important vectors of many diseases and are an emerging water quality issue which is contributing

Figure 1. This hexagon graph above the percentage of contaminants of emerging concern in biosolids.

of laboratory work to develop new analytical capabilities for the Texas Water Science Program, and other of these contaminants.

LABORATORY WORK

Analytical Method Research and Development

The Texas Water Science Biology Program is developing analytical methods for pharmaceuticals, personal care products, hormones, and other organic wastewater contaminants in biosolids. Pharmaceuticals are commonly referred to as OWCs in a variety of environmental matrices (plants, water, air, and food). Pharmaceuticals are a diverse group of chemicals that are used to treat human and veterinary diseases and conditions. Pharmaceuticals are used in the U.S. Geological Survey using a variety of analytical methods (Kolpin et al., 2002; Focazio et al., 2008; Bruce et al., 2008; Lee et al., 2005; Lindsey et al., 2001; Zaugg et al., 2002). Analytical methods for pharmaceuticals are being developed using the Texas Water Science Biology Program's state-of-the-art, multiple-analyte, sensitive, and specific methods for pharmaceuticals in biosolids. These methods will provide the necessary tools to support field studies and research to provide the environmental and basic support to support new projects focused on fate, transport, and effects.

FIELD WORK

National Reconnaissance Survey

To date, no pharmaceuticals in biosolids have been collected for the Texas Program and analytical methods are being developed. Biosolids are a complex biological matrix, and analytical methods have been focused on broad environmental survey of emerging contaminants in biosolids. Biosolids are a complex biological matrix containing the biomass from the wastewater treatment process and other contaminants. The surveys are not representative of all biosolids produced in the U.S., but are a good representation of the types of organic chemicals that are of concern to the EPA and OWCs in the Nation's water resources. This work helps

Figure 2. Percentages of contaminants of emerging concern in biosolids.

to delineate the extent of the problem and provide information to support the development of the research and monitoring needs. Biosolids are a complex biological matrix containing the biomass from the wastewater treatment process and other contaminants. The surveys are not representative of all biosolids produced in the U.S., but are a good representation of the types of organic chemicals that are of concern to the EPA and OWCs in the Nation's water resources. This work helps