34th Annual Indiana Water Resources Association Symposium "The State of the State's Waters" Ball State University Muncie, IN June 19-21, 2013

Selected Summaries of Presentations

Wednesday, June 19, 2013

1:00 Opening & Welcome Phil Bonneau, Ortman Drilling, 2013 IWRA President

1:05 What is a Public Water Supply System? Phil Bonneau, Ortman Drilling

1:20 Indiana's Water Utilities – How Will New Regulations Impact Cost and Compliance? Tom Bruns, Aqua Indiana

1:50 Supporting Indiana's Water System Operators Jim Williams, Board Member, Indiana Rural Water Association

2:05 Assisting Small Community Water Systems Leigh Ann Cross, Alliance of Indiana Rural Water

The Alliance of Indiana Rural Water is a not for profit organization that provides free (funded through Rural Development and EPA) technical assistance and training to small and rural utilities across Indiana. Through our free support we help utilities comply with Safe Drinking Water Act (SDWA) regulations and treat wastewater in a responsible manner resulting in a healthier environment and water supply for Hoosiers.

2:20 Science and Water Availability Bill Guertal, U.S. Geological Survey

3:20 Groundwater Resource Exploration: A Review of Geological and Geophysical Methods and Case Studies Mark Howell, Xenon Geosciences, Inc.

3:45 S.W.I.G – Safe Water in Guyana Jason Doerflein, Marion County Public Health Department

4:05 Cross Connection Control Program James Probst, Test Gauge & Backflow Supply, Indiana

4:25 A Municipal Perspective to Managing Stormwater Quality and Quantity in a Wellhead Protection Area Bryan Wallace, Oak Park Conservancy District

4:45 Partnering for Central Indiana's Future: The Mounds Lake Reservoir Jonathan LaTurner, DLZ & Rob Sparks, Executive Director, Corporation for Economic Development Anderson/Madison County, Indiana

5:45 Poster Session

Invertebrate and Hydrological Responses of a Midwestern Stream to Sediment Removal

Restoration Sara Burns, Indiana University

Determination of Beneficial Use Impairment Delisting Potential of the Grand Calumet River Area of Concern Kevin Gaston, IDEM Office of Water Quality

The Effects of the Pharmaceutical Carbamazepine on Aquatic Macroinvertebrate Community Structure Amanda Jarvis, Ball State University

Towards a Better Understanding of Water Flow Dynamics in Tile Drained Fields Under Drainage Water Management G. Bou Lahdou, Purdue University

Improving the representation of LID practices and BMPs in the L-THIA-LID model Yaoze Liu, Purdue University

L-THIA-LID model, an easy-to-use tool, was improved to evaluate the effects of best management practices and low impact development practices on water quantity and quality. The model was enhanced with more practices, additional approach to compute runoff quantity and quality, and implementing the practices in series. The improved model was applied on idealized watersheds and the results showed that the practices were simulated properly.

New LIDAR-Based DNR Potentiometric Surface Maps Jerry Unterreiner, IDNR, Division of Water

7:15 Banquet & Awards Ceremony

Water Needs and Growth in Central Indiana Ed Malone, Citizens Energy, Indianapolis

Thursday, June 20, 2013

8:30 Ten Ways to Reduce Nitrate Loads from Drained Cropland in Indiana Jane Frankenburger, Purdue University

8:55 Estimation of Nonpoint Source Nitrate Concentrations in Indiana Rivers Based on Agricultural Drainage in the Watershed Yan Jiang, Purdue University

There is a strong linear relationship between tile-drained area percentage and nitrate-N concentration in Indiana rivers, and this relation is consistent with the timing of drainage flow.

9:15 Effects of Atrazine, Metolachlor, Carbaryl, and Chlorothalonil on Stream Sediment Nutrient Dynamics Daniel Elias, Ball State University

Benthic organisms are an important factor of the overall nutrient dynamics in streams. Pesticides can affect the nutrient dynamics of the sediment microbial community. Changes in nutrient dynamics can affect other processes such as eutrophication.

9:35 Relationships Between Turbidity and Stream Nutrient Concentrations in an Agricultural Watershed Andrew Madison, Indiana University

10:25 Atrazine and Glyphosate Losses from Agricultural Fields: A Watershed Approach Javier Gonzalez, USDA ARS **10:45 Monitoring a Two-Stage Ditch and Its Impact on Water Quality** Andi Hodaj, Purdue University

11:05 Assessing Sediment and Nutrient Transport at Wildcat Creek Watershed through APEX Modeling Wendy Francesconi, USDA ARS

The Agricultural Policy/Environmental eXtension (APEX) model was used to compare different conservation practices using data collected by the Tippecanoe Soil and Water Conservation district and the National Soil Erosion Research Laboratory. According to the modeling results, there seems to be a tradeoff between practices that maximize sediment and nutrient reductions, and practices that are be preferred by farmers at Wildcat Creek watershed. In conclusion, cover crops were the most efficient and preferred practice that significantly improved water quality and were widely adopted by farmers.

11:25 Subsurface Hydrology Effects on Chemical Transport in Agricultural Drainage Ditches Using a 20 Meter Flume Colton Yoder, Purdue University

Continual research and monitoring of the state's water is essential not only to agriculture in general, but also to the quality of drinking water. Research in the area of water quality has proven time and time again to produce answers to problems regarding the conditions of our water supply and to solve or manage many of these problems.

1:10 Regime Shift in a Large River Fish Community: Body Size Structure and Trophic Change Mark Pyron, Ball State University

The Wabash River fish assemblage has changed substantially during the past several decades. Major changes we detected were 1) an increase in the slope of a regression of body size on body size bin categories indicating that a regime shift occurred around 1995; and 2) a switch from an assemblage dominated by planktivores to an assemblage dominated by benthic invertivores at the same time period. We suggest that combinations of anthropogenic impacts including hydrologic alterations from dam release and agricultural drainage, changes in agricultural nutrient applications and treated sewage releases resulted in this regime shift.

1:35 Why Do Flood Stages Keep Rising – Our Fault or Mother Nature's?! Siavash Beik, Christopher B. Burke Engineering, LLC

Many indications are that flood episodes and associated flood stages are increasing over years. There are 3 factors that can cause increase in flooding: 1) Climate change appears to be causing stronger and more frequent rainfalls. 2) Even for the same amount and distribution of rainfall, development in watershed appears to be causing more runoff and higher peak flows. 3) Even for the same peak flow hydrograph, cumulative small and/or major encroachments within floodplain/flow corridor appear to be causing higher flood stages. More research will need to be done to further isolate the causes of increased flood stages for the same peak flow over time and to identify actions, if any, that communities can take to stop or slow the trend, perhaps through adopting No-Adverse-Impact strategies.

1:55 Quantifying Hydrologic Budget Components in Indiana Using a Network of Meteorological and Vadose-Zone Instrument Arrays Shawn Naylor, Indiana Geological Survey

Coupled meteorological and vadose-zone monitoring networks are important for establishing water budget parameters that are used in water-resource evaluations. Accordingly, a network of 11 monitoring stations has been developed in Indiana. All 11 sites collect data to calculate potential evapotranspiration (PET) and several of the sites also collect continuous soil moisture and groundwater elevation data.

2:15 Hydrological Investigations of Streambed Sediment Removal in the Fawn River Joseph Morgan, Indiana University

Streambed hydraulic conductivity plays an important role in mediating interactions between groundwater and surface waters. Decreases in streambed conductivity were found to homogenize and reduce fluxes, and cause reduced solute residence times in the hyporheic zone.

2:35 Groundwater Flow Simulations in the Vicinity of Long Lake, Indiana Dunes National Lakeshore Dave Lampe, U.S. Geological Survey

3:25 STATEMAP and the Great Lakes Geologic Mapping Coalition Marni Dickson Karaffa, Indiana Geological Survey

3:45 The Indiana Water Monitoring Council's Groundwater Focus Committee: Achieving More through Collaboration Randy Bayless, U.S. Geological Survey

The Groundwater Focus Committee was formed during 2012 to routinely discuss, and if possible, address groundwater issues that have broad interest to a wide array of groundwater partners within the State. The Committee currently includes 30 members from 22 academic, non-profit organizations, private sector, State, Local, and Federal agencies. Meetings are currently hosted at the Indianapolis USGS office and broadcast over the world-wide web so that presentations and conversations are available to members wishing to attend remotely.

4:05 Indiana's Water Well Webviewer Randy Maier, IDNR Division of Water

Friday, June 21, 2013

8:30 Characterizing the Physical Hydrogeology at Ball State University's Ground-Source Geothermal System Lee Florea, Ball State University

8:55 Assessing the Impacts of Geology and Groundwater Flow on the Ground-Source Geothermal System at Ball State University Carolyn Dowling, Ball State University

9:15 The 2012 Drought: Water Rights and Water Use Update Mark Basch, IDNR Division of Water

The IDNR, Division of Water conducted over 200 investigations of domestic well failures during the drought of 2012. In accordance with the provisions of IC 14-24-4 (Water Rights: Emergency Regulation Statute) several domestic well owners were provided compensation for well upgrades and replacements that were required due to water level impacts caused by significant ground water withdrawal facilities. Currently, there are 3808 registered significant water withdrawal facilities (SWWF) in Indiana and nearly 150 new SWWFs in the "irrigation category" have been added during the past two years.

9:35 Groundwater Level Declines from Significant Water Withdrawl Facilities during the Drought of 2012 Ginger Korinek, IDNR Division of Water

10:25 Conditions of Indiana Streams and Rivers Using a Probabilistic Monitoring Program Todd Davis, IDEM Office of Water Quality

10:45 The First Three Years of IDEM's Cyanobacteria Surveillance Program – Where We've Been and Where We're Going Cyndi Wagner, IDEM Office of Water Quality

11:05 The Wabash Sampling Blitz: Engaging the Local Community Around the Wabash River Rebecca Logsdon, Purdue University

The Wabash Sampling Blitz is held twice per year to engage local citizens in water quality sampling. The Blitz provides the Wabash River Enhancement Corporation with a more uniform dataset than previously available, while at the same time providing an opportunity for education and outreach to the public.

11:25 Conservation Cropping Systems Demonstration Tony Bailey, USDA NRCS

Conservation Cropping Systems (CCS) Demonstrations – we really appreciated sharing the positive impacts of CCS and soil health on water quality and quantity. CCS impacts soil health by increasing soil organic matter, increasing carbon sequestration, increasing water infiltration, reducing flooding, increasing water holding capacity, reducing runoff, reducing erosion, improving nutrient cycling and improving soil biological activity. For those wanting to see the demonstration videos

(<u>http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/soils/health/?cid=stelprdb1048858</u>) or those wanting additional information, see Indiana Soil Health

(<u>http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/in/home/?cid=nrcs144p2_031079</u>) or the National Soil Health webpages

(http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/soils/health/).

12:15 Meeting Adjourned