26th Annual
Indiana Lakes Management Society
Conference

"Dedicated to our Lakes"

March 20th & 21st, 2014
BLOOMINGTON CONVENTION CENTER
BLOOMINGTON, Indiana

ILMS Mission Statement

“To Promote and Encourage the Understanding and Comprehensive Management of Lakes and Reservoirs and Their Watershed Ecosystems.”
26TH ANNUAL
INDIANA LAKES MANAGEMENT SOCIETY
CONFERENCE

March 20th & 21st, 2014 - Bloomington Convention Center - Bloomington, IN

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ILMS wishes to acknowledge the generous contributions of all of our wonderful conference sponsors!
26TH ANNUAL
INDIANA LAKES MANAGEMENT SOCIETY CONFERENCE

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26TH ANNUAL
INDIANA LAKES MANAGEMENT SOCIETY
CONFERENCE

Bloomington Monroe County Convention Center, Second Floor

AGENDA

Thursday, March 20, 2014

9:00 am - 11:00 am
BOARD MEETING/CONFERENCE SET-UP
The Great Room

10:00 pm - 12:00 pm
EXHIBITOR SET-UP
The Great Room

12:00 - 1:00 pm
REGISTRATION
Next to escalator

1:00 pm - 1:05 pm
WELCOMING REMARKS/EVENT LOGISTICS
The Great Room
- Heather Buck, ILMS President

1:05 pm - 1:45 pm
PLENARY PRESENTATION
The Great Room
Aquatic Plant Community Assessment of Indiana Lakes: What Conclusions Can Be Reached
- Robin Scribailo & Mitchell S. Alix
  Purdue University North Central
Thursday, March 20, 2014

1:45 pm - 3:15 pm  WORKSHOPS - Part I

Duke Energy Room East  Algae Identification
- Ann St. Amand, Phyco Tech

The Great Room  Aquatic Plant Identification
- Melissa Clark, Indiana University

3:15 pm - 3:45 pm  BREAK

The Great Room

3:45 pm - 5:00 pm  WORKSHOPS - Part II

Duke Energy Room East  Algae Identification
- Ann St. Amand, Phyco Tech

The Great Room  Aquatic Plant Identification
- Melissa Clark, Indiana University

5:00 pm - 6:00 pm  SOCIAL HOUR BEGINS! Join us for cocktails and start placing your bids for our Scholarship Silent Auction! Winners will be announced during our Friday Awards Luncheon.
Poster Session - Aaron Marti, Ball State University.

6:00 pm - till?  SAMPLE BLOOMINGTON! Come explore this great city with us and enjoy specials and appetizers at a string of wonderful local restaurants!

6:00 pm - 10:00 pm  HOSPITALITY SUITE
The Great Room
AGENDA

Friday, March 21st, 2014

7:30 am - 9:00 AM  BREAKFAST
The Great Room

8:00 am - 9:00 am  REGISTRATION OPEN
Next to Escalator

8:15 am - 8:45 am  ILMS ANNUAL MEMBERSHIP MEETING
Duke Energy Room East

9:00 am - 9:05 am  WELCOMING REMARKS/EVENT LOGISTICS
The Great Room
- Heather Buck, ILMS President

9:05 am - 9:50 am  PLENARY PRESENTATION
The Great Room
A Lake’s History Revealed From Sediment Cores
- Introduction by Allen Chesser, Chairman
  The Lake Maxinkuckee Environmental Council (LMEC)
- Presentation by Kyle E. Juracek, Ph.D. Research Hydrologist
  United States Geological Survey (USGS)

9:50 am - 10:15 am  BREAK
The Great Room
Duke Energy Room East

Track 1: Water Quality

10:15 am - 10:45 am
Forty Years of Lake Monitoring: Are Our Lakes Getting Better or Worse? - Greg Bright, Commonwealth Biomonitoring

10:45 am - 11:15 am
Blooms of Algal Toxin Microcystin in Relation to Watershed Land Use in Northeastern Indiana: 2009 - 2013 - Juliana Savia, Indiana University School of Public and Environmental Affairs

11:15 am - 11:45 am
Evaluation of the Impacts of the Stone Lake Boat Races Held May 31 - June 2, 2013 LaPorte, Indiana - Ashlee Haviland, Indiana Department of Natural Resources

The Great Room

Track 2: Issues for the Future

10:15 am - 10:45 am
Living With Harmful Algal Blooms - Stephanie Smith, Beagle Bioproducts, Inc.

10:45 am - 11:15 am
FEMA/Floodplain Changes - Joe Mallory, Flood Mapping and Darren Pearson, Flood Insurance, Indiana Department of Natural Resources, Division of Water

11:15 am - 11:45 am
Lake Impacts on Property taxes and Values in Koscuisko County - Nate Bosch, Anna Burke and Neha Verma, Center for Lakes and Streams

11:45 am - 1:00 pm
LUNCH
The Great Room
FRIDAY’S AGENDA CONTINUED

Duke Energy Room East

**Track 1: Stormwater Management**

1:00 pm - 1:30 pm  
Best Management Practice, Maintenance, and Permitting  
- Bill Santelick, Integrated Lakes Management

1:30 pm - 2:00 pm  
The RAIN Initiative: Grassroots Green Infrastructure  
- Tim Clark, Indiana University School of Public and Environmental Affairs

2:00 pm - 2:30 pm  
What is an MS4 Program?  
- Dana Wilkinson, Monroe County Highway Department

**The Great Room**

**Track 2: Lake Management**

1:00 pm - 1:30 pm  
Assessment and Prioritization of the Riparian Buffer Zone of Lac Courte Oreilles Using Geographic Information Systems  
- Kara Fitzpatrick, Indiana University School of Public and Environmental Affairs

1:30 pm - 2:00 pm  
Removing Silt and Sediment with Minimal Environmental Impact  
- Jeff Brooks, Ed Roe and David Held, Heartland Dredging

2:00 pm - 2:30 pm  
Indiana Lakes: How Land Use Influences the Predictability of Trophic State Index Scores  
- Melissa Clark, Indiana University School of Public and Environmental Affairs

2:30 pm - 3:00 pm  
**BREAK**  
The Great Room
FRIDAY’S AGENDA CONTINUED

Duke Energy Room East  
**Tract I: Restoration**

3:00 pm - 3:30 pm  
The History and Restoration of Houghton Lake - *Ellen Jacquart, The Nature Conservancy*

3:30 pm - 4:00 pm  
Selecting Lakeshore Plants - *Kevin Tungesvick, Spence Nursery*

4:00 pm - 4:30 pm  
USFWS Partnerships and Native Restoration - *Jeff Keifer, U.S. Fish and Wildlife Service*

4:30 pm - 5:00 pm  
Implementation of a Littoral Zone: Techniques Used - Lessons Learned - *Tom Estrem, Cardno JFNew*

The Great Room  
**Tract 2: Watershed Management**

3:00 pm - 3:30 pm  
Soil & Water Conservation Districts - Who they are, how they are funded and what they do - *Martha Miller, Monroe County Soil & Water Conservation District*

3:30 pm - 4:00 pm  
CAFOs Possible Pollution? - *Kim Ferraro, Hoosier Environmental Council*

4:00 pm - 4:30 pm  
From the Hilltop to the Streambed: The Influence of Land Cover on the Sediment-Water Column - *Andrew Madison, Indiana University*

4:30 pm - 5:00 pm  
The Hill Ditch/Crosby Lakes Dam Removal and Stream Restoration Project - *John Kusnier, Davey Resource Group*
Agenda at a Glance:

**Time** | **Thursday, March 20, 2014**
---|---
| **The Great Room**
9:00 am - 11:00 am | Board Meeting/Conference Set-up
10:00 am - 12:00 pm | Exhibitor Set Up
12:00 pm - 1:00 pm | Registration ~ Next To Escalator
1:00 pm - 1:05 pm | **Welcome** ~ Heather Buck, ILMS President
1:05 pm - 1:45 pm | **Plenary** ~ Aquatic Plant Community Assessment of Indiana Lakes
Robin W. Scribailo and Mitchell S. Alix - Purdue University

| **Workshops** | Duke Energy Room East | The Great Room |
---|---|---|
1:45 pm - 3:15 pm | Algae Identification Part I Ann St. Amand, Phyco Tech Inc. | Aquatic Plant Identification Part I Melissa Clark, Indiana University |
3:15 pm - 3:45 pm | Break | The Great Room |

| **Workshops** | Duke Energy Room East | The Great Room |
---|---|---|
3:45 pm - 5:00 pm | Algae Identification Part II Ann St. Amand, Phyco Tech Inc. | Aquatic Plant Identification Part II Melissa Clark, Indiana University |

5:00 pm - 6:00 pm | **Cocktail Hour/Silent Auction Items on Display** ~ The Great Room |

**Poster Session - Aaron Marti, Ball State University - The Great Room**

6:00 pm - ???: Join us for this unique experience as we walk to nearby local restaurants/bars to sample their specials and appetizers! **SAMPLE BLOOMINGTON!** **SAMPLE BLOOMINGTON!**

6:00 pm | **Hospitality Suite** | The Great Room
## 26th Annual
### Indiana Lakes Management Society Conference

<table>
<thead>
<tr>
<th>Time</th>
<th>Friday, March 21, 2014</th>
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<tbody>
<tr>
<td>7:30 am - 9:00 am</td>
<td>Breakfast ~ The Great Room</td>
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<td>8:00 am - 9:00 am</td>
<td>Registration Open ~ near escalator</td>
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<td>ILMS Annual Membership Meeting ~ Duke Energy Room East</td>
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<td>What is an MS4 Program? - <em>Dana Wilkinson, Monroe County Highway Department</em></td>
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AQUATIC PLANT COMMUNITY ASSESSMENT OF INDIANA LAKES: WHAT CONCLUSIONS CAN BE REACHED?

Robin W. Scribailo and Mitchell S. Alix
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Abstract: Aquatic macrophytes are an integral component of aquatic ecosystems, stabilizing sediments, trapping nutrients, providing refuge and foraging habitat for invertebrates and fish. The structure and composition of aquatic plant communities are often assessed to evaluate the effectiveness of management strategies aimed at improving lake quality. In Indiana Lakes these strategies primarily focus on reducing the abundance of invasive aquatic plant species and the input of excessive nutrient within the watershed. Current standardized quantitative methods of sampling aquatic plants yield data on species richness and abundance which can be used to calculate Simpson's Index of diversity. This index is often used to compare species diversity within and among Indiana lakes. An evaluation of the merits and pitfalls of current methodology is presented. In addition we will also discuss the use of alternative sampling protocols and metrics that may provide a more sensitive and accurate measure of change in the aquatic plant community.
Session: Thursday’s Workshop

Part I - 1:45 pm - 3:15 pm
Part II - 3:45 pm - 5:00 pm

ALGAE IDENTIFICATION PARTS I & II

Ann St. Amand, Ph.D., CLP
President
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620 Broad Street, Suite 100
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Abstract: Algae are an important part of a properly functioning natural aquatic system, but when algae become over abundant, water uses and habitat are often impaired. All algae were not created equal, however, and proper identification is important to determining management strategy. With recent apparent increases in toxic algae and issues with taste and odor, understanding algae has become even more important. This workshop is intended to provide information on how to recognize common major groups of algae, with emphasis on nuisance algae. Basic information on ecology and control will be also covered.
Session: Thursday’s Workshop

Part I - 1:45 pm - 3:15 pm
Part II - 3:45 pm - 5:00 pm

AQUATIC PLANT IDENTIFICATION PARTS I & II

Melissa Clark
Director, North American Lake Management Society – Region 5
Director, Indiana Clean Lakes Program
Senior Lecturer, School of Public and Environmental Affairs
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Abstract: Aquatic macrophytes are an important part of every lake ecosystem. While they provide numerous ecosystem services, they also provide the best shoreline protection and at the same time are often under appreciated. While plants can interfere with certain lake activities, many of these plants are aquatic invasive species. Proper identification and monitoring is important to determining the best management strategy. This workshop is intended to provide information on how to identify the major types of plants and tips on how to more closely identify down to species, with emphasis of recognizing native species verses invasive species. Background information on the Indiana Clean Lakes program and its Volunteer Monitoring Program for early detection and mapping, ecology, and management will also be covered.
Session: Friday’s Plenary Introduction

PLENARY INTRODUCTION: HISTORY OF LAKE MAXINKUCKEE

Allen Chesser
Council Chair
Lake Maxinkuckee Environmental Council
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Culver, IN 46511
574-842-3686
lmecc@lakemax.org

Abstract: Lake Maxinkuckee is an 1854 acre kettle lake created by the Wisconsin Glacier approximately 15,000 years before the present. The watershed for Lake Maxinkuckee is 8850 acres in size, once covered by deciduous woodlands comprised of climax species. Artifacts discovered in the watershed provide evidence of human presence from 11,000 BC and pretty much through the Paleo, Archaic and Woodland time periods, to a time when written history became available.

For well over 100 years agriculture applied fertilizer, used full tillage and straightened drains and ditches. During this same time our watershed saw the growth of homes around the lake with the Town of Culver adding hard surfaced roads and storm drains. All of these activities, along with storm events that cause significant soil erosion, have added sediments and nutrients to the lake.

Water samples taken over the last 20 years have consistently shown that more phosphorous has entered the lake in solution and suspension than has left the outlet. This accumulation has been a troubling fact, in that it was unknown if the phosphates were attached to sediments, if these deposits were likely to become available to aquatic plants should we see rising temperatures in the future and approximately how large this deposit is.
AN ENVIRONMENTAL HISTORY OF LAKE MAXINKUCKEE, INDIANA, REVEALED FROM SEDIMENT CORES

Kyle Juracek, Ph.D.
Research Hydrologist
United States Geological Survey (USGS)
4821 Quail Crest Place
Lawrence, KS 66049-3839
785-832-3527
kjuracek@usgs.gov

Abstract: Effective management to preserve and protect Lake Maxinkuckee requires an understanding of past and present lake and basin conditions. Such an understanding is attainable, in part, through analyses of lakebed sediment cores that can be used to: (1) assess historical and current water- and sediment-quality conditions, (2) help identify constituents of concern in the lake, (3) understand the trophic history of the lake, (4) establish a baseline of lake and basin conditions, and (5) assess the effects of human activity. In 2013, the U.S. Geological Survey, in cooperation with the Lake Maxinkuckee Environmental Council and Marshall County, Indiana, began a 2-year study of Lake Maxinkuckee. Lakebed sediment cores were collected at 6 sites using a box corer to sample recent sediment and a gravity corer to sample pre-development sediment. The cores were analyzed for radionuclides, nutrients, trace elements, diatoms, and cyanobacterial akinetes.

In the recent sediment, an increasing trend in phosphorus concentrations was measured that may be indicative of changing inputs and (or) inlake phosphorus dynamics. Trace element concentrations were less than the probable-effects guidelines, which represent the concentrations above which toxic biological effects usually or frequently occur. However, arsenic concentrations typically exceeded the threshold-effects guideline (TEG), which represents the concentration above which toxic biological effects occasionally occur. Historically, lead concentrations exceeded the TEG then decreased below the TEG in recent decades at most coring sites. A total of 191 diatom species were identified in the sediment. Amphiara ovalis, a eutrophic indicator species, exhibited an overall decreasing trend in abundance in recent decades. The dominant cyanobacterial akinete in the sediment, Gloeotrichia echinulata, is indicative of clear-water, low-phosphorus conditions.
FORTY YEARS OF LAKE MONITORING: ARE OUR LAKES GETTING BETTER OR WORSE?

Greg Bright
Commonwealth Biomonitoring
8802 W. Washington St.
Indianapolis, IN 46231
gbright@biomonitor.com

Abstract: The federal Clean Water Act of 1972 started in motion a very successful series of events that has resulted in much cleaner water in the United States. Part of the effort included funds to monitor chemistry, biology, and habitat of lakes and streams to see if we’re making any progress. The Indiana State Board of Health (now IDEM) began monitoring Indiana lake quality forty years ago. They established a monitoring protocol that has been followed consistently, first by state employees, now by the Indiana University Clean Lakes Program of SPEA. Many public lakes get a “check-up” every three years or so. Because a single monitoring protocol has been followed, it is possible to compare one year to another to see if conditions are stable, improving, or declining.

How are we doing? The Indiana “trophic status index” (TSI), first invented by Harold BonHomme of the Indiana State Board of Health, uses information on nutrients, water clarity and algal density to produce a score for each lake. The maximum score with this index is 75 points. Lakes with high TSI scores have the worst water quality, with algae blooms so bad that they are completely useless for fishing, swimming, or boating. Forty years ago, there were 28 lakes in our state that had a TSI score greater than 60. Now there are none. We will look at some data for these “problem lakes” to observe how much conditions have improved over the past 40 years in Indiana.
BLOOMS OF ALGAL TOXIN MICROCYSTIN IN RELATION TO WATERSHED LAND USE IN NORTHEASTERN INDIANA: 2009 - 2013

Juliana Savia
MPA/MSES Dual Master
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Abstract: This study used ArcGIS to look at locations and quantities of the algal toxin Microcystin, released by the cyanobacteria Microcystis aeruginosa. Only two lakes in the study area of Northeastern Indiana had levels above WHO “low risk” to human health standards, so the sample size was not large enough to draw significant conclusions. However, it appeared that the presence of microcystin was more prevalent in land used for farming with a lower percentage impervious surface.
EVALUATION OF THE IMPACTS OF THE STONE LAKE BOAT RACES HELD MAY 31—JUNE 2, 2013 LAPORTE, INDIANA

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Abstract: Stone Lake is a 150-acre natural lake in LaPorte. The Indiana Department of Natural Resources (IDNR), Division of Law Enforcement issued a permit regarding a high speed boat race at Stone Lake. Local residents contested the issuance of the permit due to the already established speed limit of 10 mph and the lake size. The permit was issued allowing racing over a three day period. IDNR was directed to assess the shoreline, vegetation, water quality and any other concerns prior to, during, and after the event. Several assessments were performed to evaluate the condition of the lake such as a hydroacoustic survey, vegetation sampling, shoreline assessment, and water chemistry monitoring. Several rare plants are present in Stone Lake and continued to be found after the race. Some plant parameters decreased slightly following the race. An increase in fragmented vegetation was observed. Water clarity declined in July and August and Soluble Reactive Phosphorus and nitrate were elevated in August. Other water chemistry parameters increased through the racing period but dropped to normal levels as the summer progressed. If future races are held several recommendations were offered to aid in protection of this quality lake. Most recommendations focused on decreasing sediment disturbance and nutrient resuspension. It was also recommended that Eurasian watermilfoil control be performed three weeks or more before the racing weekend to reduce fragmentation and spread within the lake.
LIVING WITH HARMFUL ALGAL BLOOMS

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Abstract: The Environmental Protection Agency defines a community water system (CWS) as one that supplies water to the same population year round. Only 22% of the >50,000 CWS in the country utilize surface water, with the remainder drawing upon groundwater sources. However, while surface waters comprise a minority of the CWS, they serve over 70% of the 300.2 million people serviced by CWS, demonstrating the significance of surface water reservoirs to the public. Surface waters are vulnerable to pollution via nutrient loading (eutrophication), such as can result from runoff of fertilizers or animal manure. When combined with warm temperatures and seasonal increases in sunlight, eutrophication can foster harmful algal blooms (HABs), which are expected to continue to increase in frequency and intensity with climate change.

As HABs have increased, so have the costs and consequences of dealing with them, from both drinking water and recreational perspectives. Challenges range from the sheer volume of biomass that must be removed from source waters to ensuring that waterborne algal toxins are not present in the finished water. Treatment plant operators have been applying effective tools to meet these challenges, but most often in a very reactive manner, rather than a proactive manner.

We propose a model where low-cost tools can be applied in a very pragmatic fashion to help operators proactively prepare for a HAB, and craft a time- and cost-efficient response to a HAB in a surface water reservoir. In the long run these tools can reduce operational costs, and currently they are the best options operators have until there are more effective technologies for treating the HABs themselves. In this three-part model, we recommend that operators monitor trends in their water that might be suggestive of a HAB, identify whether the water contains potentially toxic cyanobacteria, and measure toxins when it makes sense to do so. Examples of tools for each of these steps will be discussed, as will the advantages and limitations of each.
Session: Track A2 - Issues for the Future 10:45 am - 11:15 am

FEMA/FLOODPLAIN CHANGES

Joe Mallory, Floodplain Mapping
and
Darren Pearson, Flood Insurance
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Abstract: The Federal Emergency Management Administration has issued changes in regards to floodplain mapping and the administration of the program. This presentation will address how those changes may impact property owners.
LAKE IMPACTS ON PROPERTY TAXES AND VALUES IN KOSCUISKO COUNTY

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Abstract: Kosciusko County is home to more than 100 lakes. This abundance of lakes impacts many aspects of the community including its economy. The present study identifies lake impact on property taxes and values as specific indicators of economic impact. In 2012, the presence of lakes in Kosciusko County directly caused the generation of at least $15,000,000 in additional property tax revenues for the county. Properties within 500 feet of the 41 largest lakes in the county accounted for 37% of total county property tax revenues. These same lake properties have a total value of $3,000,000,000 which is predominately (76%) made up of single family home properties. These property values, and thus property tax revenues, are subject to change based on improved or degraded water quality of these lakes. Therefore, efforts of lake associations, environmental consultants, government agencies, watershed groups, and academic institutions are important for future economic development, funding of public services, and personal wealth considerations.
26th ANNUAL
INDIANA LAKES MANAGEMENT SOCIETY
CONFERENCE

Session: Track B1 - Stormwater Management 1:00 pm - 1:30 pm

BEST MANAGEMENT PRACTICE, MAINTENANCE AND PERMITTING

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Abstract: All across the state and nation, manmade lakes and stormwater BMPs are in need of care and maintenance. All too often these features are ignored, assumed to be working as they should. It is not until the lack of maintenance reaches a level of nuisance (swimming or fishing bays become choked with weeds or sediment) or property damage occurs (flooding due to restricted or plugged outlet structures) that most take notice of these functional, aesthetic features.

Continuous, targeted maintenance is necessary for lakes and BMPs, just as it is for all other infrastructure. The party responsible for this maintenance should plan for and include maintenance in their annual budget and/or Reserve Studies, just as they do for landscaping, and infrastructure repairs.

While maintenance is inevitable, and necessary, the permits needed to perform maintenance can often be time consuming, and costly to obtain. Multiple levels of regulatory approval are often necessary to perform sediment removal maintenance, which can lead to extended project schedules, and increased costs to perform the work.

In this presentation, we will explore a few case studies of projects that encountered a lack of continuous maintenance, resulting in flooding and property damage, as well as extended project schedules and increased budgets due to permitting obstacles to routine maintenance.
THE RAIN INITIATIVE: GRASSROOTS GREEN INFRASTRUCTURE

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Abstract: The RAIN (Restorative Adaptations for Infrastructure) Initiative is an action- and research-based organization founded by graduate students at the School of Public and Environmental Affairs at Indiana University. The RAIN Initiative works to improve existing and install new efficient, cost-effective infrastructure for the purposes of stormwater management at Indiana University and in the city of Bloomington. The group’s major project is currently an investigation of the efficacy of berms for the removal of nutrients and sediments, which are negatively impacting Lake Griffy, at the IU Golf Course. Additionally, the RAIN Initiative is assisting in the drafting of a feasibility plan for stormwater Best Management Practices for a local Bloomington neighborhood. These projects have involved the integration of scientific principles and urban planning, grant sourcing and management, the monitoring and analysis of water quality data, co-production of solutions with public agencies and private homeowners, and the use of technical modeling software.

Our presentation will focus on the RAIN Initiative’s efforts to encourage a paradigm shift of grey to green regarding stormwater at the local level, and our determination to educate the public on the potential for manufactured ecological processes to provide crucial, cost-effective solutions.
WHAT IS AN MS4 PROGRAM?

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Abstract: Non-point source pollution has received greater focus in recent years as we learn more and more about its combined effects on water quality. Municipal Separate Storm Sewer System (MS4) programs can be an integral part in many communities to protecting aquatic environments and educating the public about stormwater. Learn what a MS4 program entails, how it can help protect lakes, and how you can get involved!
Session: Track B2 - Lake Management 1:00 pm - 1:30 pm

ASSESSMENT AND PRIORITIZATION OF THE RIPARIAN BUFFER ZONE OF LAC COURTE OREILLES USING GEOGRAPHIC INFORMATION SYSTEMS

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Abstract: The purpose of this project is to map and prioritize the riparian buffer zone of a Wisconsin lake so that a shoreline management plan can be developed. For each shoreline parcel, data were collected on the shoreline component (e.g. rip rap, lawn, etc.), vegetation width, slope, erosion, and photograph. This data was used to prioritize each parcel’s exigency for shoreline management that would protect the lake’s water quality from sediment and nutrient loading, and the ecological effects of poor shoreline habitat.

Using geographic information systems, the shoreline data was overlain with parcel delineations, a percent slope coverage, and soil data. The final product is a color-coded prioritization map, symbolizing each parcel’s need for shoreline improvements. This information is currently being used by the Courte Oreilles Lakes Association to inspect shoreline conditions, develop a riparian buffer zone management plan, and in developing a TMDL. The map will soon be available to the public through the lake association’s website.

Another integral part of this study consisted of a written, mailed survey of lakeshore residents to assess the understanding of and attitude toward riparian buffer zone management. The results of the surveys show that 75% of respondents would plant more vegetation on the shoreline of their property in order to protect the lake. An even greater percent of respondents said that they would do so if a free landscaping service were offered. Interestingly, 27% would volunteer in a program that organized riparian buffer zone management and implementation.
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Session: B2 - Lake Management 1:30 pm - 2:00 pm

REMOVING SILT & SEDIMENT WITH MINIMAL ENVIRONMENTAL IMPACT

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Abstract: The purpose of this presentation is to offer a system to remove unwanted silt and sludge from bodies of water with minimal disruption to the environment or water users, while improving the habitat for aquatic life.

A private property owner had a severe problem with sediment buildup in a pond on their property, threatening the wildlife's habitat. The pond is home to several rare black swans, fish, and other wildlife. Without draining the pond nor harming the wildlife, we pumped over 7,000 cubic yards of sediment into geo-textile tubes at a new pond site, slightly more than a mile away. There, after the material dried, it was incorporated into the surrounding landscape.

Aquatic life benefits from sediment removal. Water quality is improved by increasing oxygen levels and reducing spread of invasive plants. Fishermen and boaters benefit from greater water depths and habitat for fish.
INDIANA LAKES: HOW LAND USE INFLUENCES THE PREDICTABILITY OF TROPHIC STATE INDEX SCORES

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Abstract: A trophic state index is valuable because it takes water quality parameters and assigns it a score that corresponds with the lake’s level of biological productivity. The index scores (0-100) allow for better understanding and interpretation among lake managers and citizen lake users with a numerical scale that parallels descriptive, but less distinct, classifications of oligotrophic, mesotrophic, and eutrophic. The Carlson Trophic State Index (TSI) is the most commonly used and accepted trophic index. It mathematically offers predictability between Secchi disk transparency, chlorophyll a concentrations, and total phosphorus concentrations. One should be able to predict the TSI score based on one of these three parameters and vice versa. Indiana lakes, however, deviate from the expectations of the Carlson TSI in regards to total phosphorus and chlorophyll a. This is largely due to the development and land conversions within the catchment areas. This session will explore the variety of Indiana lakes and how, like many other Midwest lakes, non-algal turbidity strongly influences and increases the total phosphorus Carlson TSI above the corresponding chlorophyll a Carlson TSI.
THE HISTORY AND RESTORATION OF HOUGHTON LAKE

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Abstract: Houghton Lake is a 360-acre property in Marshall County purchased by The Nature Conservancy in 2005. The highly alkaline 20-acre lake is ringed by high quality fen, which was surrounded by agricultural fields which graded from wet muck up to dry upland soils. The Nature Conservancy has restored the hydrology and planted native vegetation on the 160 acres of agricultural field and is now managing the site through prescribed fire and invasive species control to provide habitat for a wide range of species that use this site, from massasauga rattlesnakes to river otters.
SELECTING LAKESHORE PLANTS

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Abstract: Naturalizing shorelines with native plants provides a variety of benefits including reduced shoreline erosion, nutrient removal, and waterfowl control. Shoreline plantings are most effective when they cover several planting zones to form a broad band of vegetation. Proper planting season, herbivore exclusion, and developmental maintenance are vital to successful long-term establishment.
Session: C1 - Restoration  
4:00 pm - 4:30 pm

USFWS PARTNERSHIPS AND NATIVE RESTORATION

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Abstract: The U.S. Fish and Wildlife Service’s (USFWS) Partners for Fish and Wildlife (PFW) Program works in voluntary partnership with private landowners, conservation organizations, local communities, and corporations to restore habitats for migratory birds such as waterfowl and songbirds, aquatic species including fish and amphibians, and threatened and endangered species throughout Indiana. With 97% of Indiana’s land base in private ownership, a major component of any successful landscape restoration effort in the state must include fostering cooperation with private landowners. Technical and financial assistance is available from the USFWS and other partners to help private landowners restore and enhance native habitats, including wetlands, grasslands, and riparian forests. PFW efforts are primarily targeted within 6 geographic focus areas in the state, each of which emphasizes restoration projects involving specific habitat types benefiting priority species. This strategic approach to habitat restoration links USFWS priorities with those of other conservation agencies, organizations and plans, including Indiana DNR, Ducks Unlimited, The Nature Conservancy, and the North American Waterfowl Management Plan. Lakes within Indiana are well represented by the geographic focus areas, and efforts to restore terrestrial habitats (e.g. wetlands, riparian forests) can have a positive impact on water quality within the watersheds of these lakes. An example includes work being done within the watershed of Lake Wawasee in northeast Indiana.
IMPLEMENTATION OF A LITTORAL ZONE PLANTING: TECHNIQUES USED AND LESSONS LEARNED

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Abstract: Approximately 1000 ft² of littoral environment was planted using various installation techniques to establish native emergent and floating aquatic plants in Lake Maxinkuckee. Planting occurred from the water’s edge to a depth of three feet and utilized three planting techniques: pre-planted coir mats, concrete donuts and direct bare-root plantings. Enclosure structures were used around some of the planting to protect against fish and wildlife disturbance. The project spanned three growing seasons, resulted in a wide range of site conditions which later proved to be valuable when assessing the success of each planting technique. All techniques proved successful and establishment of emergent and floating species was achieved. Information was gathered on the successful application of each technique and included such considerations as water depth, plant species, plant stock size and disturbance level. Lessons learned from this project can help aide in the successful establishment of future littoral zone planting projects.
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Session:  C2 - Watershed Management 3:00 pm - 3:30 pm

SOIL & WATER CONSERVATION DISTRICTS - WHO THEY ARE, HOW THEY ARE FUNDED AND WHAT THEY DO

Martha Miller
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Abstract: Soil & Water Conservation District's: What are they? Where did they come from? How many are there? How are they funded? Join us to find out more about most county's best kept secrets. Hear from local SWCD District Manager, Martha Miller as she shares with you the unique and interesting operations of Indiana's Soil & Water Conservation Districts.
CAFO PRESENTATION

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Abstract: There are a number of confined feeding operations (CAFOs/CFOs) in Indiana. This has raised serious concerns about impacts on the environment and tourism from the noxious odors, air emissions and water pollution often associated with these giant livestock factories. If they are in a highly erodible area, they could cause serious erosion, manure runoff, and risk the safety of local drinking water.

People who live near large animal factories, are encouraged to attend, along with those concerned about the pollution and economic impacts on the community. Participants will leave with an understanding of the environmental, human health, and community concerns, as well as possible solutions. Part of the workshop content covers local government, land use and zoning laws, and environmental regulations so attendees will understand the legal framework applicable to CAFOs and CFOs.
FROM THE HILTOP TO THE STREAMBED: THE INFLUENCE OF LAND COVER ON THE SEDIMENT-WATER COLUMN

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Abstract: The ratio of forest cover to cultivated croplands influences the transport of soils and soil-bound nutrients from fields to streams via overland flow. We investigated the influence of forest cover on nutrient dynamics in five watersheds in southeast Indiana. All watersheds are impacted by agriculture and total P concentrations between 1 and 5 mg/L have occurred in the streams during runoff events. Stream water samples were collected from March, 2013 to January, 2014 and evaluated for total phosphorus concentration, soluble reactive phosphorus, nitrate-N and ammonium-N. Increased forest cover had a significant impact on reducing total and dissolved nutrient concentrations during runoff events. Increased soil transport associated with overland flow and narrow riparian buffers is the proposed mechanism behind this relationship. Wide riparian forest buffers and cover crops are effective methods to prevent soil erosion or trap eroded soil and hold promise for reducing nutrient inputs to streams and downstream lakes and reservoirs in Indiana.
THE HILL DITCH/CROSBY LAKES DAM REMOVAL AND STREAM RESTORATION PROJECT, TOLDEO BOTANICAL GARDEN

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Abstract: For almost 50 years, Toledo Botanical Garden, in Toledo, Ohio has provided a venue where gardens, the arts, and nature can coexist and be enjoyed by all. One of the most prominent features at the garden is Crosby Lake, which consists of a series of two ponds totaling 2.5 acres that were created in the mid 1980s by excavating Hill Ditch, a small captured stream that ran across the property. Water levels in the two ponds were controlled by two low-head dams. Over the years the lake had become a nuisance due to accumulated sediments, unstable banks, and the presence of invasive fishes and plant species. In 2011 Toledo Botanical Garden received $500,000 from the Ohio EPAs Section 319(h) Nonpoint Source Program to remove the two low-head dams and restore Hill Ditch to a self-sustaining, stream/pond/wetland complex that would reduce sediment and pollutant loads to the lake, promote the establishment of native vegetation, and enhance the in-stream habitat of Hill Ditch. This presentation will discuss the history of the site, the challenges that were presented by the initial design of an in-line pond system, and the planning, design, and construction of this project. Various streambank stabilization measures that were employed at the site, such as rock-riffle structures, bendway weirs, rock ledges, and live stakes will also be discussed.
2014 ANNUAL ILMS BUSINESS MEETING

AGENDA

• Roll Call (please sign circulating paper)

• Reading of 2013 ILMS Annual Business

• Report of President

• Report of the Secretary

• Report of Treasurer

• Reports from Committee Chairs

• Election of Officers

• Election of Directors
Indiana Lakes Management Society, Inc.

Slate of Officers and Directors
March 21, 2014

Officers

☐ Laura Esman, Secretary

☐ Christian Anderson, Treasurer

Directors (select four)

☐ Ashlee Haviland

☐ Heather Harwood

☐ Dave Smith

☐ ________________________________