The Lake Beat

Volunteer Lake Monitoring Program

March 2017

Topics:

- **Illinois Nutrient Loss Reduction Strategy**
- **Available VLMP Participation in 2017**
- **Find a Lake Puzzle**
- **Adverts and Updates**

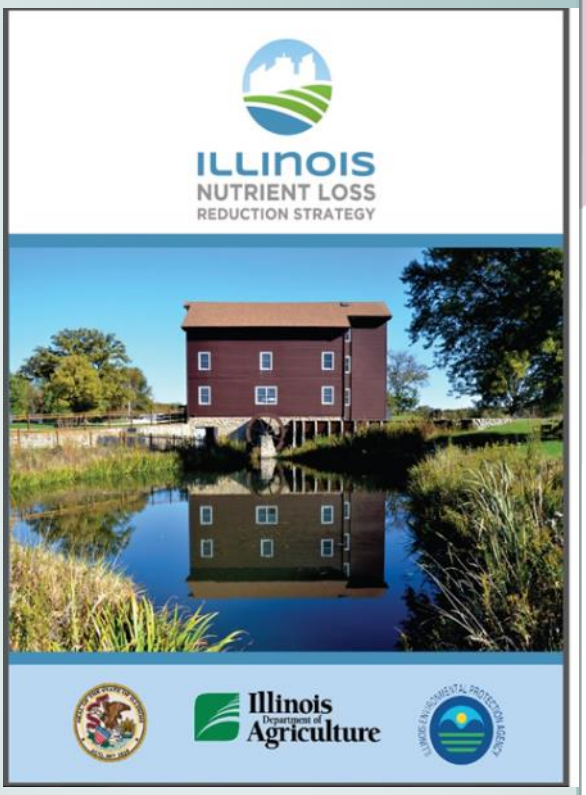
Register for the VLMP:

www.epa.illinois.gov/topics/water-quality/monitoring/vlmp/who-should-volunteer/index

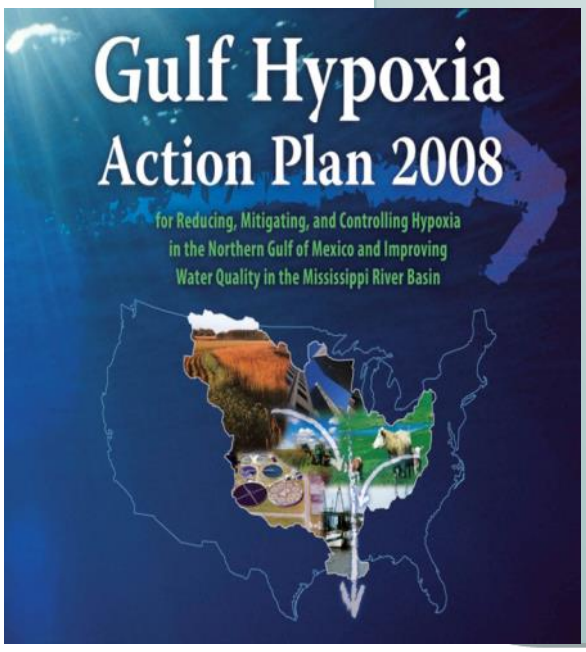
Just Click to follow link.

Illinois Nutrient Loss Reduction Strategy

Improving our water resources with collaboration and innovation



The **Illinois Nutrient Loss Reduction Strategy** (NLRS or Strategy) was released publicly on July 21, 2015. It established a goal of 45% reduction in Nitrogen and Phosphorus leaving the State of Illinois. An interim milestone was set for 2025 to reach a reduction in Phosphorus loads of 25% and Nitrogen loads of 15%. The report addresses nutrient loads from point sources, urban stormwater, and agricultural nonpoint sources.



Several workgroups were recommended to be established in the Strategy. Those workgroups have been established and are working on implementing the Strategy.

The 2008 Gulf Hypoxia Task Force Study had for its final goal to reduce the Hypoxia zone to 5,000 Km^2 (1,930 square miles) and reduce nutrient loading to the Gulf of Mexico by 45% for both Phosphorus and Nitrogen and thus, was a building document for the Strategy.

USGS SPARROW MODEL

Figure 1

Total Nitrogen				Total Phosphorus			
State	Percent of Total Flux	Cumulative Percent of Total Flux	Delivered Yield ($kg\ km^{-2}\ yr^{-1}$)	State	Percent of Total Flux	Cumulative Percent of Total Flux	Delivered Yield ($kg\ km^{-2}\ yr^{-1}$)
Illinois	16.8	16.8	1734.9	Illinois	12.9	12.9	117.4
Iowa	11.3	28.1	1167.2	Missouri	12.1	25.0	89.4
Indiana	10.1	38.2	1806.6	Iowa	9.8	34.8	89.2
Missouri	9.6	47.8	800.5	Arkansas	9.6	44.4	94.6
Arkansas	6.9	54.7	750.1	Kentucky	9.0	53.4	113.4

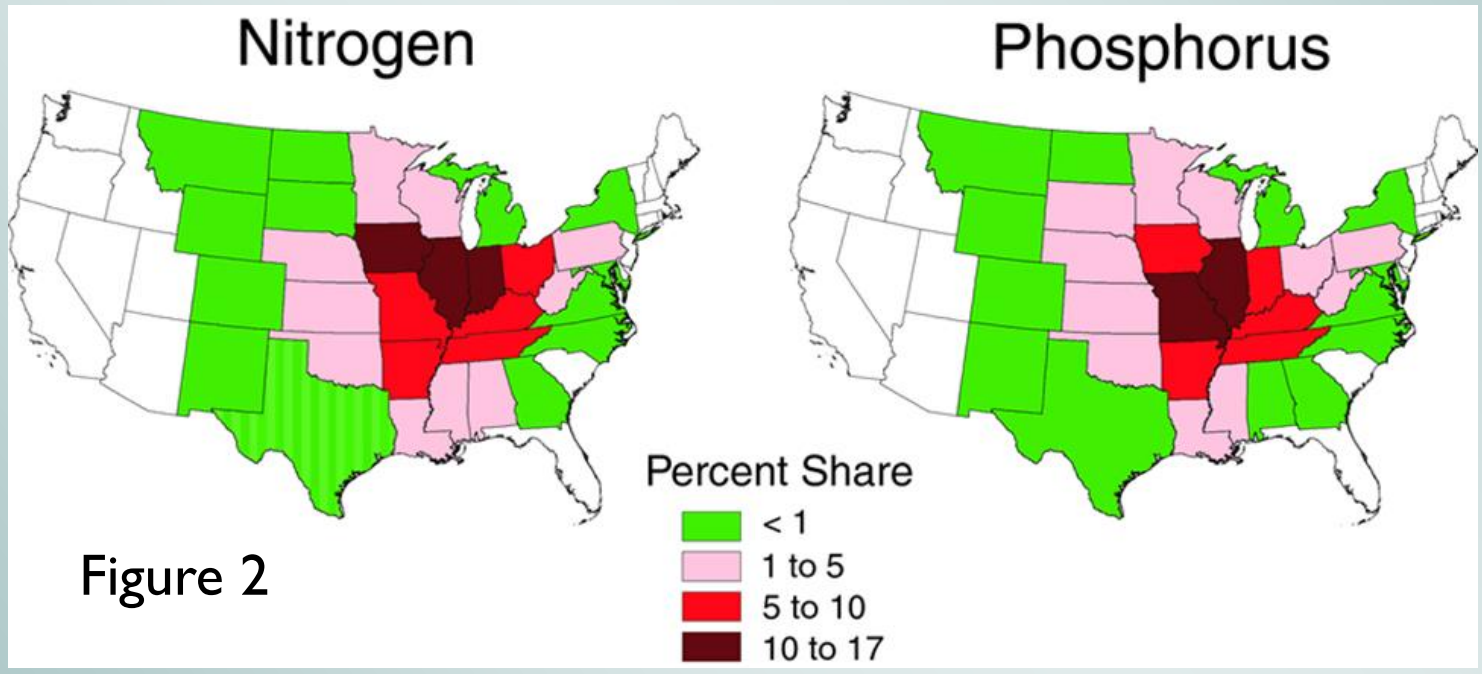


Figure 2

Using the **United States Geological Survey** (USGS) Sparrow Model, Figure 1, Illinois ranked as the highest contributor of both phosphorus and nitrogen to the Mississippi River Basin. The table in Figure 1 displays the top five states in total additive percent that each state is responsible for attributing to the total load of the stated nutrient, Nitrogen or Phosphorus. The thematic maps in Figure 2 compares the percent share category each state (with a color) falls within. Colorless states had no land that was part of the Mississippi River Basin and thus were not included. Please be aware that though a state is shaded throughout, that is not indicative of how much of that state's watershed drains into the Mississippi River Watershed.

Figure 3 Policy Working Group

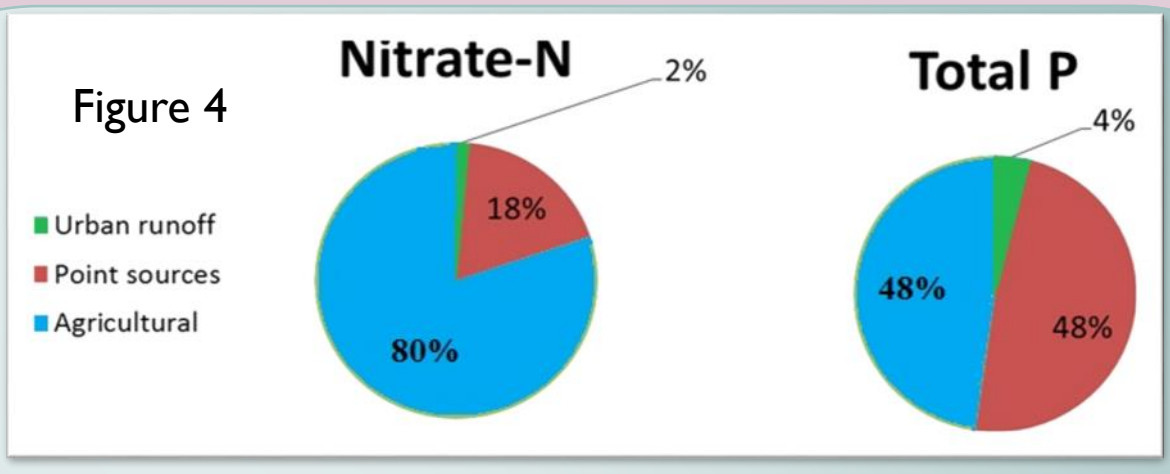
* American Bottoms Regional Wastewater Treatment Facility
* Aqua Illinois
* Association of Illinois Soil and Water Conservation Districts
* Bloomington Normal Water Reclamation District
* City of Aurora
* City, Water, Light and Power
* Downers Grove Sanitary District
* Environmental Law and Policy Center
* GROWMARK
* Illinois Association of Drainage Districts
* Illinois Corn Growers Association
* Illinois Department of Agriculture
* Illinois Environmental Protection Agency
* Illinois Environmental Regulatory Group
* Illinois Farm Bureau
* Illinois Fertilizer & Chemical Association
* Illinois Pork Producers Association
* Metropolitan Water Reclamation District of Greater Chicago
* Natural Resources Conservation Service
* Nutrient Research Education Council
* Prairie Rivers Network
* Sierra Club
* Sierra Club/Mississippi River Collaborative
* University of Illinois
* University of Illinois at Urbana-Champaign, Department of Crop Sciences
* Urbana-Champaign Sanitary District

The Policy Working Group listed above in Figure 3 is the current work group for this project.

Did you know?

The deepest lake in the world is Lake Baikal in Siberia, Russia. It is 1,637 meters (5,370 feet) at its deepest point. Try using a Secchi to measure that depth...

Figure 4



The loss reductions goals for point sources, agricultural **non-point sources** (NPS), and urban NPS are in proportion to their contribution (Figure 4). For example, once the hypoxia-related target reduction for total phosphorus from point sources is achieved, point source discharges will not be obligated to further reduce loading to the Mississippi River. However, additional reductions could be required to meet local water quality concerns if they exist.

The **Illinois Environmental Protection Agency** (Illinois EPA) projects that the target reduction for point source contributions of total phosphorus can be met by 2025 through continued implementation of **National Pollutant Discharge Elimination System** (NPDES) permit limits, optimization of existing equipment, and implementation of technology-based approaches identified in plant-specific nutrient feasibility plans.

For agricultural NPS, voluntary implementation of **best management practices** (BMPs) is expected to build on efforts already underway by farmers throughout the state and in watersheds with existing nutrient plans. It is expected that the implementation of BMPs will increase with additional outreach, education, and incentives.

What is it?

The USGS has created a hierarchical system of unique **hydrologic unit codes** from 2 to 12 digits long dividing regions, sub-regions, basins, sub-basins, watersheds, and sub-watersheds.

To support the determination of critical watersheds in the state, nutrient yields were evaluated at the **Hydrologic Unit Code 8-level** (HUC8). There are 50 HUC8s in Illinois that drain into the Mississippi River and one that drains into Lake Michigan. They range in size from 17 to 2,436 sq. mi, with an average size of about 1,100 sq. mi. The HUC8s with a small area in Illinois are actually larger, but they straddle two states. For each HUC8 available, Illinois EPA nutrient data combined with USGS stream flow gauges were reviewed. In some of the HUC8s, flow and nutrient concentration data were available for a river that drained a large part of the HUC8. In others, the gauged drainage area was much smaller than the overall HUC8.

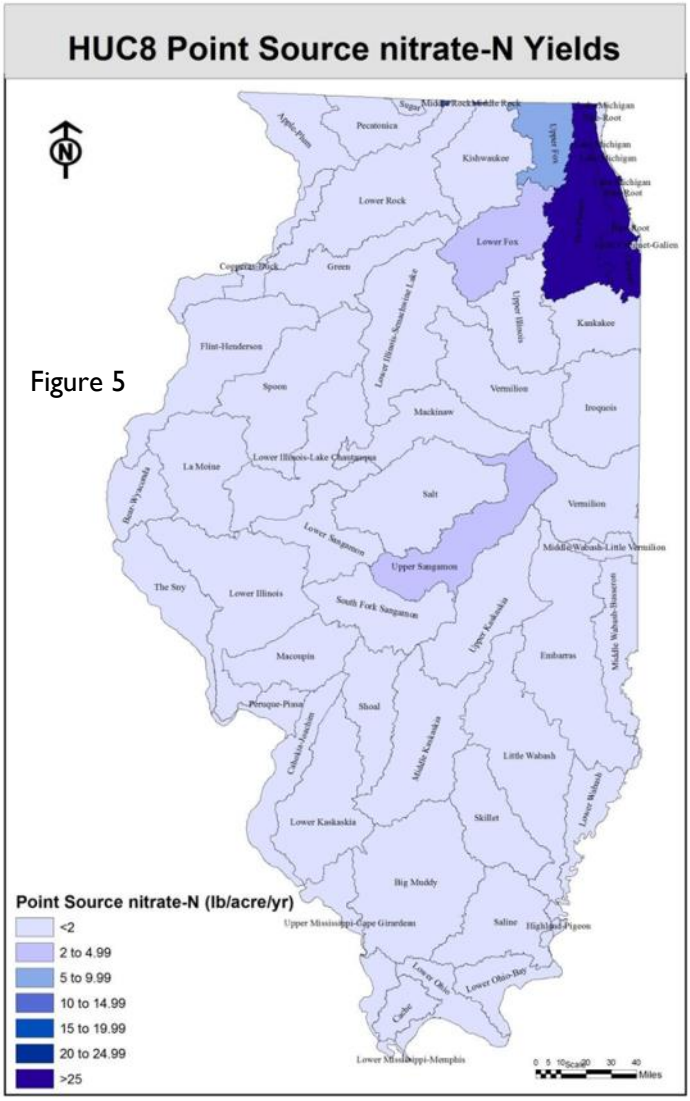


Figure 5

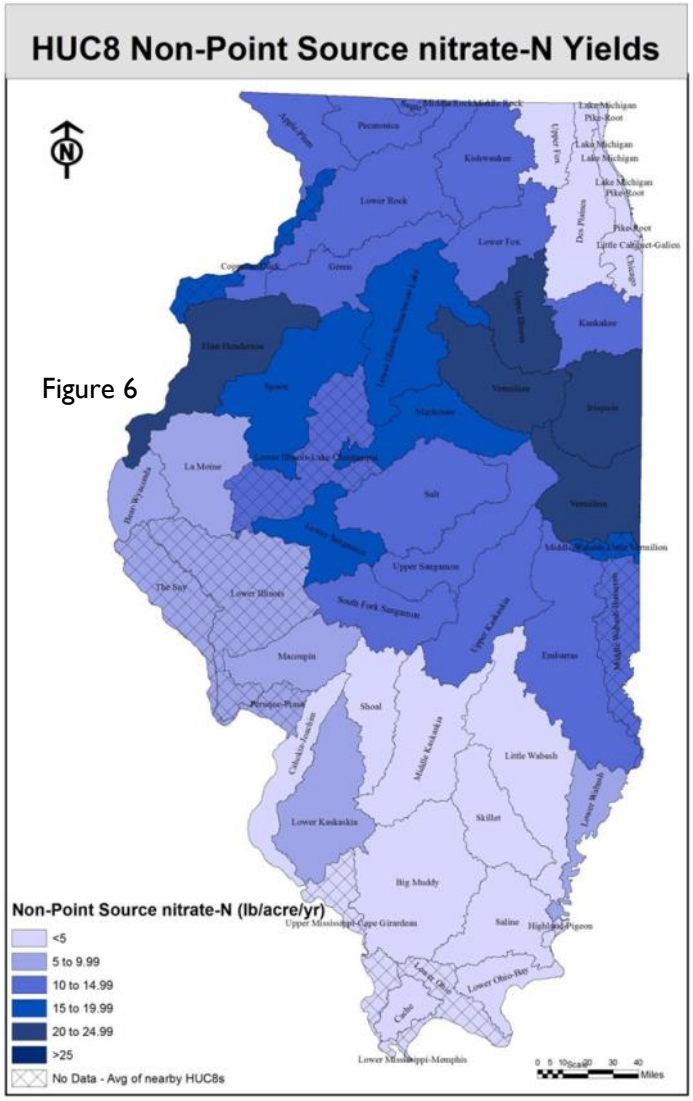


Figure 6

Figures 5 and 6 show point source and NPS nitrate-nitrogen by HUC8. The NPS yield average was 10 pounds/acre/year, with 27 HUC8s greater than 10 pounds/acre/year. For point sources, the Chicago and Des Plaines HUC8s had very large nitrate-nitrogen yields of 40.9 and 38.3 pounds/acre/year, respectively.

Point source total phosphorus yields (Figure 7) were very large in the Chicago area, the Upper Sangamon HUC8, and along the Mississippi River in some HUC8s. The Chicago and Des Plaines HUC8 were the top two point source phosphorus yields. NPS total phosphorus yields were typically greater in the southern Illinois HUC8s, with the smallest yields in northern Illinois (Figure 8).

An analysis was conducted to determine if yields of nitrate-nitrogen or total phosphorus were related to the miles of impaired streams or acres of lakes reported in the 2012 integrated report released by the Illinois EPA. Assessed 2012 303(d) listed streams as well as 305(b) impaired streams and lakes by HUC8 were included if they were listed for dissolved oxygen, total phosphorus, nitrate-nitrogen, aquatic plants, or aquatic algae (Figure 9).

To examine agriculture throughout Illinois, data on **Major Land Resource Areas** (MLRAs) published in 2006 by the **U.S. Department of Agriculture** (USDA) **Natural Resources Conservation Service** (NRCS) were used. MLRAs are geographically associated land resource units based on climate, soils, and land use. There are 15 MLRAs in Illinois, but several have only a small area in the state. Therefore, the state's MLRAs were combined into a total of nine as shown in Figure 10.

Nitrogen information obtained through USDA **National Agricultural Statistics** Service (NASS), David et al. (2010), and University of Illinois (2012a) were used to collect data on planted crop acres and yields on such crops as corn, soybean and wheat. Nitrogen applications were estimated on the acreage. Drainage data was collected and estimated for the various MLRAs.

To obtain nitrate-nitrogen yields per row crop acre, NPS nitrogen yields were integrated in each HUC8 across each MLRA to determine the average load of nitrate-nitrogen. The resulting values ranged from 3.9 to 7.4 pounds/acre/year in southern Illinois and 19.6 to 31.3 pounds/acre/year in central and northern Illinois.

Data on fertilizer and manure phosphorus usage per county came from Jacobson et al. (2011). Data on cattle and cattle feed were obtained from NASS.

Fertilizer phosphorus application rates on cropland ranged from 11 to 14.9 pounds/acre/year, with little variation across the MLRAs, and manure phosphorus rates ranged from 1.2 t 5.4 pounds/acre/year. The largest manure phosphorus rate was in MLRA 3 in northwestern Illinois, where there was a high density of livestock. Total phosphorus yields per row crop acre ranged from 0.68 to 2.82 pounds/acre/year, with greater losses in southern Illinois and the least in northeastern Illinois.

These data will be the basis for applying nutrient reduction BMPs by MLRA across Illinois.

Figure 7

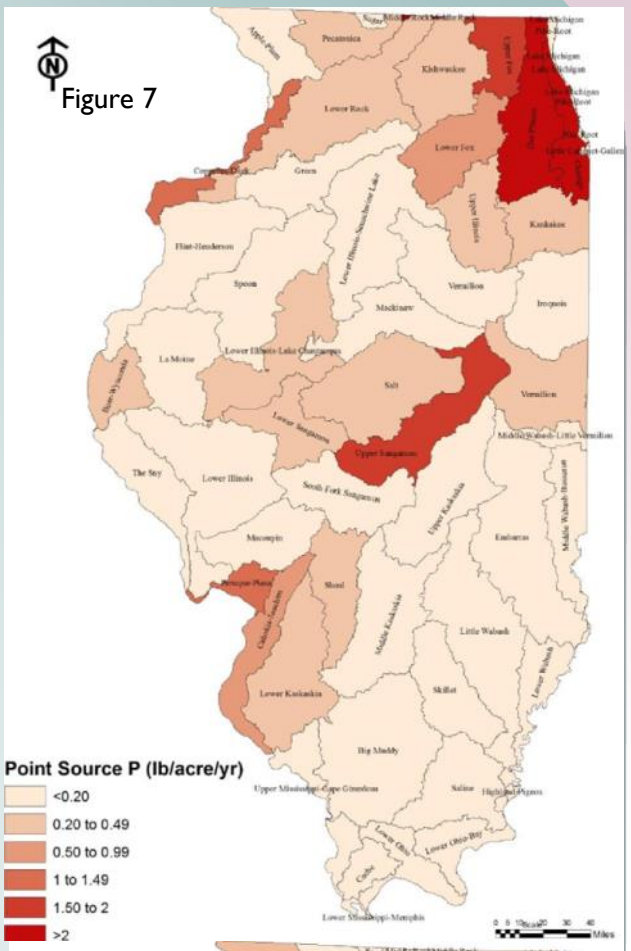
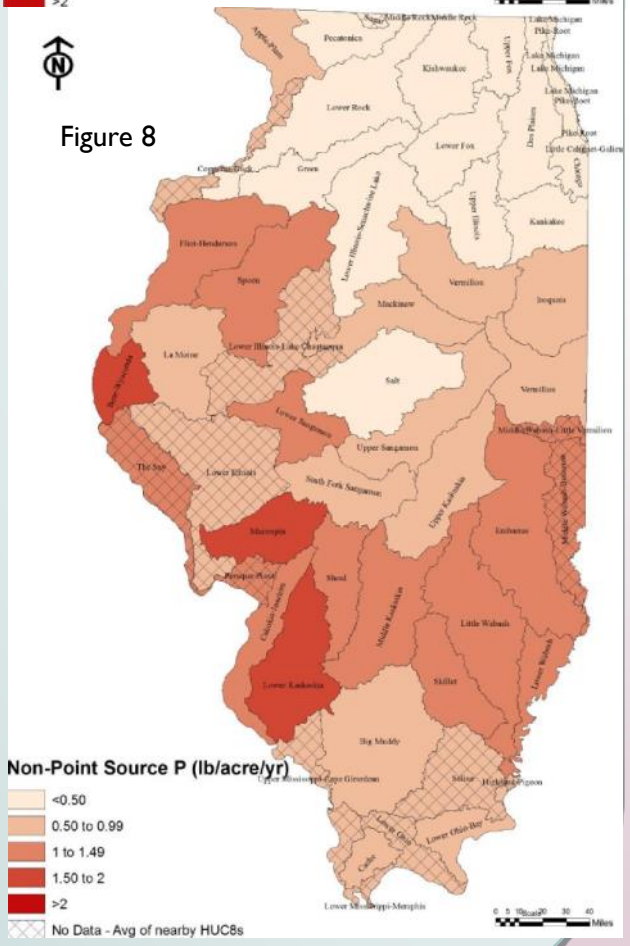


Figure 8



A full range of BMPs were considered that could be applied in Illinois to reduce both nitrate-nitrogen and phosphorus losses as they apply to point source reductions with cost estimates, and NPS reduction practices for both nitrate-nitrogen and phosphorus with cost estimates. A look at Figure 11 shows how the reduction BMPs were managed for both NPS nutrients using three main categories: in field practices, edge of field practices, and land use change.

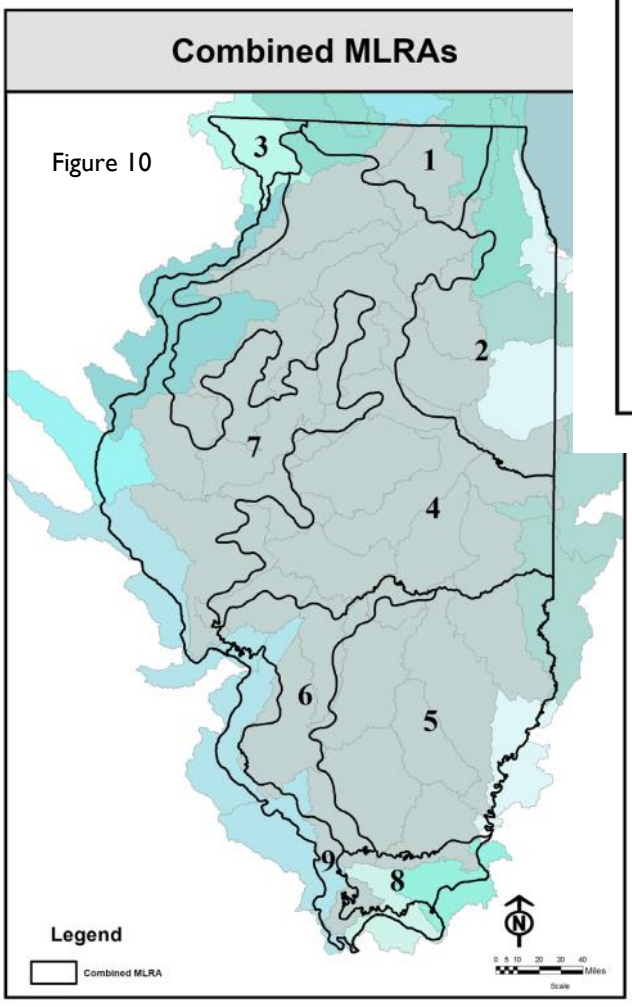


Figure 10

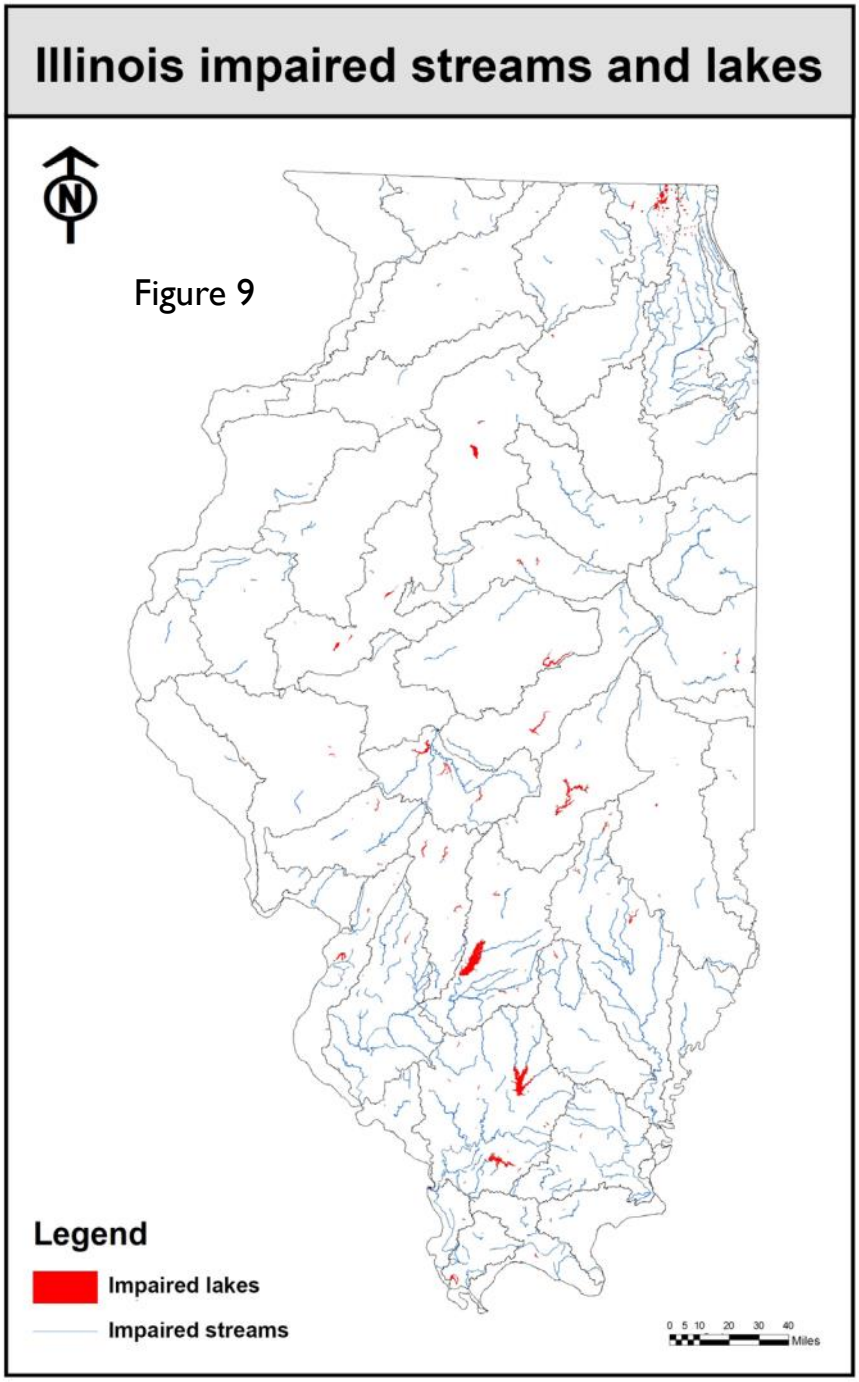


Figure 9

Figure 11. Non-Point Source Reduction Practices

Nitrate

- In Field Practices
  - Nitrogen Management
  - MRTN, Inhibitors, Split appl.
  - Cover Crops
- Edge of Field Practices
  - Bioreactors
  - Buffers (non-tile drained)
  - Wetlands
- Land Use Change
  - Perennial/Energy Crops

Phosphorus

- In Field Practices
  - Reduced Tillage Systems
  - Soil Tests/Nutrient Management
  - Cover Crops
- Edge of Field Practices
  - Buffers
  - Wetlands
- Land Use Change
  - Perennial/Energy Crops

The U.S. Environmental Protection Agency (USEPA) "*Recommended Elements of a State Nutrients Framework*" (Stoner 2011) required that states developing a nutrient loss reduction plan prioritize watersheds for reduction actions. Priority watersheds are those expected to have the greatest capacity to reduce high volumes of nutrient losses annually (Figure 12).

Three separate priority lists were developed specifically for the Strategy: agricultural watersheds for total phosphorus loss, agricultural watersheds for nitrate-nitrogen loss, and point source watersheds for total phosphorus and nitrate-nitrogen loss. An additional list was developed based on the agricultural industry's **Keep it for the Crop** (KIC) priority watershed list. Each of these four categories were addressed separately. While all watersheds are important to nutrient reduction goals and will receive consideration for funding programs aimed at reducing nutrient losses or inputs into Illinois waters, the watersheds on these lists will be targeted for funding, outreach, and implementation programs and will be more closely monitored for nutrient loss improvements.

Three watersheds are considered a priority for addressing total phosphorus losses from agricultural NPS contributing to Gulf hypoxia: Big Muddy River Watershed, Embarras River Watershed, and Little Wabash River Watershed. Five watersheds are considered a priority for addressing nitrate-nitrogen losses from agricultural NPS contributing to Gulf hypoxia: Lower Illinois-Senachwine Lake Watershed, Lower Rock River Watershed, Mississippi Central Watershed/Henderson Creek, Vermilion-Illinois River Watershed, and Vermilion-Wabash River Watershed. The two Vermilion River priority watersheds are included to augment the successes those watersheds are seeing as part of the KIC program. The initial priority watersheds selected included: Lake Bloomington Watershed, Lake Vermilion Watershed, Salt Fork Vermilion River Watershed, Vermilion River Watershed, Lake Decatur Watershed, and Lake Mauvaise Terre Watershed. Two additional KIC watersheds were added in 2013: Lake Springfield Watershed and Evergreen Lake Watershed.

The primary nutrient concern for point source effluent is total phosphorus, and the highest priority watersheds are already the focus of point source reduction efforts for total phosphorus. However, the five priority watersheds for point source contributions are those that rank high in both total phosphorus and nitrate-nitrogen loading: Upper Fox River Watershed, Des Plaines River/DuPage River Watershed Upper Sangamon River Watershed, Lower Rock River Watershed, and Illinois River-Senachwine Lake Watershed. While the Chicago/Little Calumet Watershed does contribute a substantial total phosphorus load (3.69 million pounds/year), it does not rank at the top of the prioritization due to current water quality and the lack of watershed-based plans in the watershed. This watershed will be considered when addressing point source Inputs and will be considered an ad hoc priority for point sources.

Illinois Nutrient Loss Reduction Strategy priority watersheds

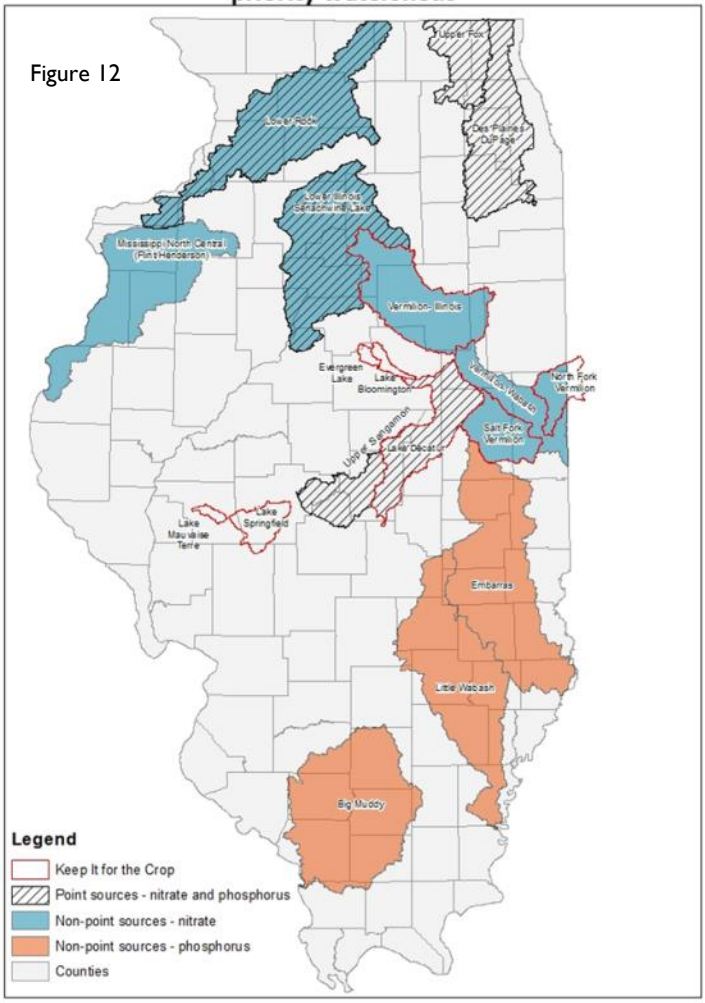
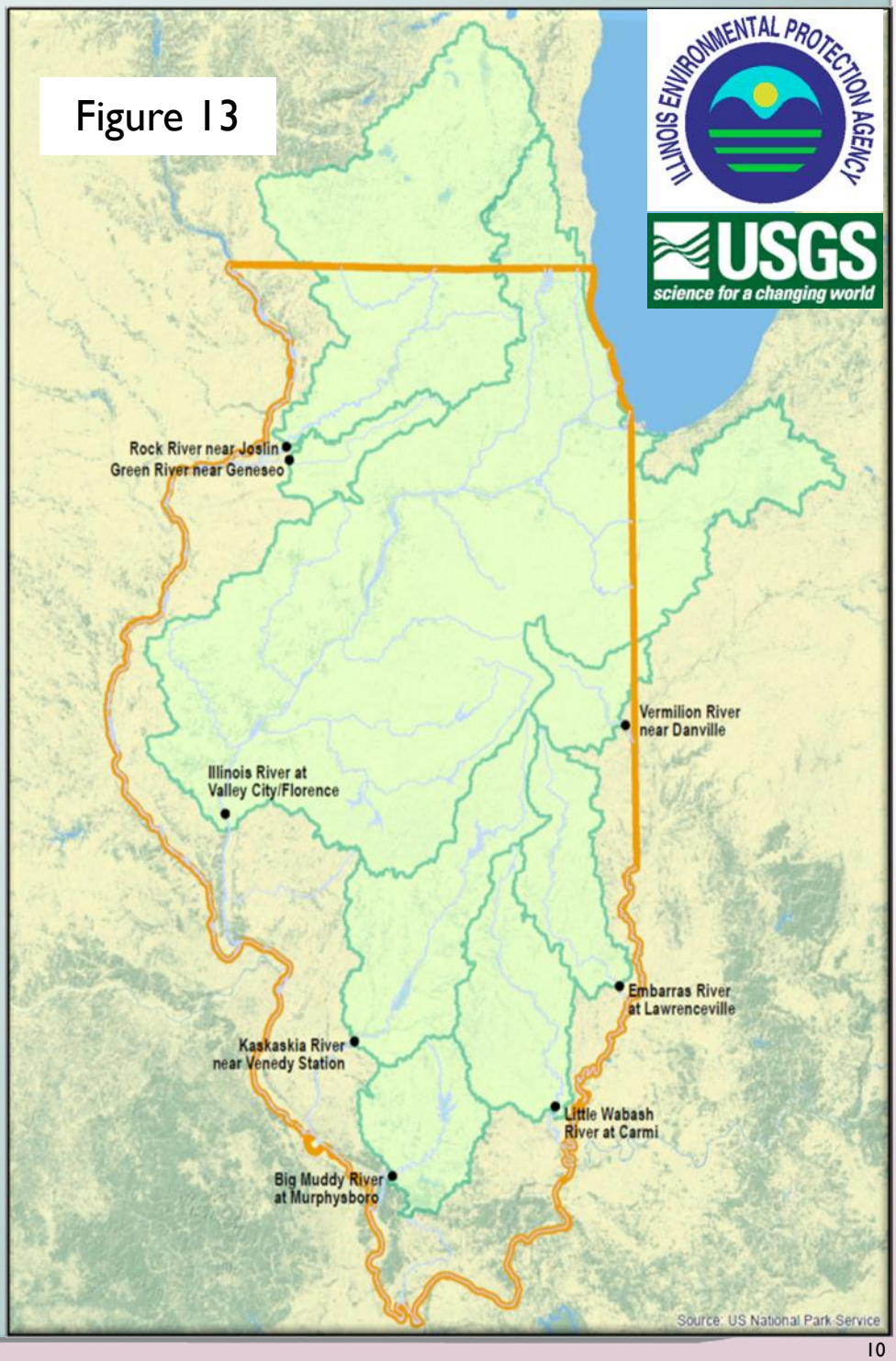


Figure 12

Statewide Nutrient Export Loadings Network

Monitoring the changes in loadings exported from large rivers can help determine which management strategies will work best within a basin statewide. Real-time nutrient monitoring at the following Illinois EPA water quality and USGS gage sites (Figure 13) will provide nutrient export estimates from approximately 74 percent of Illinois:

- Rock River near Joslin
- Green River near Geneseo
- Illinois River at Florence
- Kaskaskia River at New Athens
- Big Muddy River at Murphysboro
- Vermilion River near Danville
- Embarras River at Ste. Marie
- Little Wabash River at Carmi



Did you know?

The Mississippi River Basin at 1.15 million square miles is 14% smaller than the Nile River Basin at 1.31 million square miles. However, the Amazon River Basin is 9% larger than the other two basins combined at 2.67 million square miles. Use that factoid at your next cocktail party!

Figure 14. Showing Progress

- Track environmental outcomes and implementation activities
- Water Quality monitoring programs—local water quality/nutrients loads
    - Statewide Nutrient Export Loadings Network
- Point and Non-Point Source Implementation
    - Illinois EPA NPDES permits
    - Illinois EPA 319 Non-Point Source Grants
    - Soil Conservation Transect Surveys
    - NRCS conservation Programs
    - Ag Industry Voluntary Reporting

The actions needed to reduce nutrient losses to water are diverse, with multiple parties responsible for implementation. To demonstrate that action is being taken and progress is being made, a system of tracking both environmental outcomes and implementation of program activities is needed. Illinois has a suite of programs, (Figure 14 is not all-inclusive), that together form the toolbox for implementing strategic actions that reduce nutrient losses. Illinois will take advantage of existing tracking programs and methods as much as possible, adding new efforts as appropriate, to reach the Gulf of Mexico hypoxia and local water quality goals and milestones. The fundamental measurement of progress is improved water quality.

Working groups are convened to answer questions raised in this strategy and monitor progress (Figure 15). Illinois EPA has contracted with the Illinois Water Resources Center (IWRC) at the University of Illinois to facilitate the implementation and communication phase of the strategy.

The Policy Working Group set 2011 as the baseline year for tracking implementation activities to coincide with the last year of load estimation.

Figure 15. Implementation Groups

- Nutrient Monitoring Council
    - Monitoring activities to measure nutrient loads in streams
- Nutrient Science Advisory Committee
    - Develop nutrient water quality standards
- Urban Stormwater Working Group
    - Address Urban runoff implementation activities
- Point Source Working Group
    - Address nutrient loss reductions from Point Sources
- Benchmark Committee
    - Set future interim goals and milestones—initial focus on point sources
- Agricultural Water Quality Partnership Forum
    - Address nutrient loss reductions from agriculture

Figure 16. Strategy Implementation Reporting

- A report will be prepared every two years to provide an update on Strategy implementation.
- The first report will be published in September, 2017.
    - Baseline 2011 and 2015 agriculture conservation data
    - Urban Stormwater activities
    - Point Source permit reductions
    - Water quality—nutrient loads

A biennial report, that compiles the implementation of strategic actions for the previous 24 months, will be developed by September 1st every other year as part of reporting requirements (Figure 16, is not all inclusive). The outcomes of the current programs and new workgroups described above will be summarized statewide and by watershed. Illinois EPA will also include a nutrient update in the Integrated Water Quality Report published every two years. This will ensure that the public receives nutrient loss reduction updates through numerous venues.

http://www.epa.illinois.gov/topics/water-quality/watershed-management/excess-nutrients/nutrient-loss-reduction-strategy/index

All meeting agendas and minutes for the Illinois NLRS are posted on the website above.

References

Illinois Environmental Protection Agency et al. 2015. Illinois Nutrient Loss Reduction Strategy: Improving our water resources with collaboration and innovation. Available at www.epa.illinois.gov/topics/water-quality/watershed-management/excess-nutrients/nutrient-loss-reduction-strategy/index.

Mississippi River/Gulf of Mexico Watershed Nutrient Task Force. 2008. Gulf hypoxia action plan 2008 for reducing, mitigating, and controlling hypoxia in the northern Gulf of Mexico and improving water quality in the Mississippi River Basin. Washington, DC. Available at https://www.epa.gov/ms-htf/hypoxia-task-force-2008-action-plan-and-related-documents

Available VLMP Participation in 2017

The 2017 Volunteer Lake Monitoring Program will remain at the same levels as the 2016 season.

- **Tier 1 has 150 slots:**
  - The purpose of the Tier 1 level is to educate interested citizens on lake issues and to collect basic transparency and aquatic plant coverage information on a seasonal basis, May thru October. Additional information collected include apparent water color, water level, weather conditions, rainfall, and aquatic invasive species tracking. No experience is needed to join the program at the Tier 1 level; however, the volunteer needs access to a boat with an anchor, personal floatation equipment, and (if possible) internet access, to input the data collected about their sampling event.
- **Tier 2 has 75 slots:**
  - The purpose of the Tier 2 level is to provide expanded water quality education and collect baseline water quality parameters. These parameters include total phosphorus, chloride, alkalinity, ammonia, nitrate/nitrite, total Kjeldahl nitrogen, total suspended solids, and volatile suspended solids.
    - Note: Though Tier 2 also includes the work process of a Tier 1, it does not take up a Tier 1 slot.
    - Note: As equipment becomes available, some Tier 2 volunteers collect dissolved oxygen/ temperature (DO/temp) profile information at their stations as well.
    - Note: On special occasion or for special projects, some Tier 2 volunteers may collect chlorophyll samples to further help evaluate lake water quality.
- **Tier 3 has 4 slots:**
  - The purpose of the Tier 3 level is to provide expanded water quality education and collect data for Agency use in various programs, including lake assessments in the Biennial Water Quality Reports. Parameters included are the same as those in Tier 2; however, more station locations and depths are added to get a better picture of lake-wide conditions. DO/temp profiles are taken at all stations. Chlorophyll sampling is conducted at all station locations. Only seasoned volunteers are eligible.
    - Note: Though Tier 3 also includes the work process of a Tier 1, it does not take up a Tier 1 slot.
    - Note: Tier 3 and Tier 2 slots are mutually exclusive. A volunteer cannot be enrolled in both, as Tier 3 is essentially a complex variation of the training received at Tier 2, if the Tier 2 volunteer has opted to participate in DO/temp and chlorophyll sampling as resources become available.

FIND A LAKE

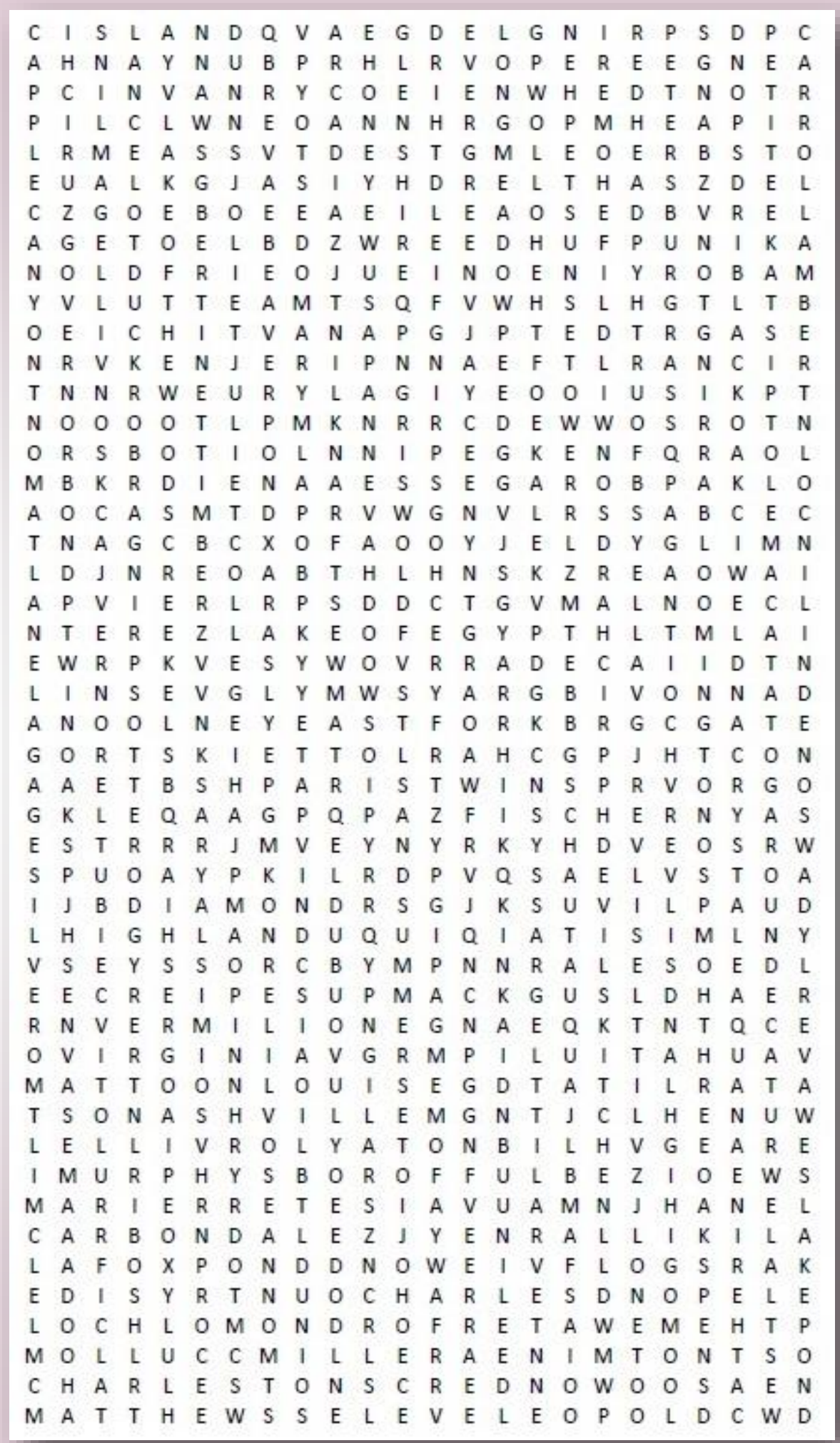
The 155 lakes in the 2016 VLMP are condensed down to these 143 lake names. For example, only one Sunset is present in the puzzle, not three and Loon is used instead of East Loon and West Loon.

If you want to check off the ones you find, a check list has been provided on the following page.

I had a lot of fun making this puzzle!

The first three to find me at the ILMA Conference with a completed puzzle receives a prize.

~Greg



FIND-A-LAKE WORD LIST

WORD LIST

- [ ] Altamont
- [ ] Antioch
- [ ] Apple Canyon
- [ ] Arcadia
- [ ] Bangs
- [ ] Barrington
- [ ] Bass
- [ ] Beaver
- [ ] Beaver Pond
- [ ] Bertinetti
- [ ] Bird's Pond
- [ ] Black Oak
- [ ] Bloomington
- [ ] Bluff
- [ ] Borah
- [ ] Butler
- [ ] Camelot
- [ ] Campus
- [ ] Candlewick
- [ ] Carbondale
- [ ] Carroll
- [ ] Catatoga
- [ ] Catherine
- [ ] Cedar
- [ ] Charles
- [ ] Charleston SCR
- [ ] Charlotte
- [ ] Chautauqua
- [ ] Chicago Botanic Garden
- [ ] Countryside
- [ ] Cross
- [ ] Crystal
- [ ] Dawson
- [ ] Decatur
- [ ] Deep
- [ ] Devil's Kitchen
- [ ] Diamond
- [ ] Druce
- [ ] Duck
- [ ] Dunns
- [ ] Echo
- [ ] Evergreen
- [ ] Fischer
- [ ] Forest
- [ ] Fourth
- [ ] Fox
- [ ] Fyre
- [ ] Gages
- [ ] Galena
- [ ] Gamlin
- [ ] Glenshire
- [ ] Golfview
- [ ] Goose
- [ ] Governor Bond
- [ ] Grass
- [ ] Grays
- [ ] Griswold
- [ ] Herrin
- [ ] Highland
- [ ] Highland Silver
- [ ] Homer
- [ ] Honey
- [ ] Island
- [ ] Jacksonville
- [ ] Jaycee
- [ ] Joliet Junior College
- [ ] Killarney
- [ ] Kinkaid
- [ ] LaFox Pond
- [ ] Lake of Egypt
- [ ] Lake of the Hollow
- [ ] Lake of the Woods
- [ ] Lambert
- [ ] Lancelot
- [ ] Le-Aqua-Na
- [ ] Leopold
- [ ] Lincoln
- [ ] Linden
- [ ] Little Grassy
- [ ] Little Silver
- [ ] Loch Lomond
- [ ] Long
- [ ] Longmeadow
- [ ] Loon
- [ ] Louise
- [ ] Loveless
- [ ] Marie
- [ ] Matthews
- [ ] Mattoon
- [ ] Mauvaiseterre
- [ ] McCullom
- [ ] Miller
- [ ] Miltmore
- [ ] Minear
- [ ] Murphysboro
- [ ] Napa Suwe
- [ ] Nashville
- [ ] Nippersink
- [ ] Olney East Fork
- [ ] Ossami
- [ ] Otter
- [ ] Palmyra-Modesto
- [ ] Paradise
- [ ] Paris Twins
- [ ] Petersburg
- [ ] Petite
- [ ] Pierce
- [ ] Pine
- [ ] Pistakee
- [ ] Redhead
- [ ] Richardson Wildlife
- [ ] Round
- [ ] Sand
- [ ] Sara
- [ ] Silver
- [ ] Spring
- [ ] Spring Arbor
- [ ] Spring Ledge
- [ ] Springfield
- [ ] Stephen
- [ ] Summerset
- [ ] Sunset
- [ ] Swan
- [ ] Taylorville
- [ ] Third
- [ ] Thompson
- [ ] Three Oaks
- [ ] Timber
- [ ] Tower
- [ ] Twin Oaks
- [ ] Valley
- [ ] Vermilion
- [ ] Vernor
- [ ] Virginia
- [ ] Waterford
- [ ] Waverly
- [ ] Weslake
- [ ] West Franklin
- [ ] Westlake
- [ ] Wonder
- [ ] Woodhaven
- [ ] Woods Creek
- [ ] Zurich

ILMA-LAKES
ILLINOIS LAKES MANAGEMENT ASSOCIATION

32nd Annual ILMA-Lakes Conference

March 30th-April 1st, 2017
Holiday Inn, Crystal Lake Conference Center

The 32nd annual conference will feature such topics as:

- In-lake processes,
- Watershed issues,
- Lake protection and restoration,
- Climate variability,
- Planning and policy,
- Using VLMP data,
- Algae, and
- Carp.

Two full days of technical sessions will be held on Thursday and Friday, March 30-31, with a half day workshop on Saturday, April 1, to cover all the steps needed for writing a lake management plan. The complete agenda and speaker list is available on the ILMA website at www.ilma-lakes.org, as well as this information, and much, much, more.

NOTE: Thursday and Friday is worth 10 professional development hours (PDHs) and Saturday is worth 4 PDHs.

Online registration is still available, but late registration has started. There are two methods of registration: online and paper (mail-in) form. Online registration uses PayPal, which accepts major Credit Cards. Call 1-800-338-6976 (01) to see if you can still use the mail-in form.

Algal Toxin Health Advisories for Recreational Use

While cyanobacteria (blue-green algae) occur naturally in our lakes, under certain conditions they can grow very rapidly, forming what are called harmful algal blooms (HABs). Blooms are called harmful when exposure to the bloom can result in adverse health effects to humans and animals. Some cyanobacteria can produce substances that are potentially toxic to humans and animals and these substances are called cyanotoxins. Microcystins and Cylindrospermopsin are two of these cyanotoxins.

Cyanotoxins are released into the water as cyanobacteria grow and die. During a harmful bloom, toxin concentrations can become elevated in the water and can persist in the water even after the bloom is over. You can be exposed to elevated levels of cyanotoxins if you swim, play in, or recreate on or in a waterbody where a HAB exists. Toxins can be ingested, inhaled or absorbed through the skin.

Adverse health effects from exposure to these cyanotoxins may range from a mild skin rash to serious illness or death. Acute illnesses have been reported due to exposure to cyanotoxins and after short-term exposures, microcystin and cylindrospermopsin could cause liver and kidney damage.

Pets may also be exposed to these toxins if they drink water from a lake contaminated by cyanobacteria, lick their fur after swimming in contaminated water, or consume toxin containing algal scum or mats. Pets can also be exposed if they drink tap water contaminated with cyanotoxins.

In December 2016, USEPA issued draft *Human Health Ambient Water Quality Criteria / Swimming Advisories* for two cyanotoxins (Table 1). These draft criteria are recommended concentrations of microcystins and cylindrospermopsin that protect human health while swimming or participating in other recreational activities on the water. Because children spend more time in the water and ingest more water per body weight while recreating, USEPA derived these recommended criteria based on children's recreational exposures. The recommended criteria values apply in either fresh or marine recreational waters. These draft criteria are currently under review.

***Table 1*. Health Advisory for Recreational Water**

Algal Toxin	< 6 years	Target Tissues
Microcystin	4.0 ppb [A, B]	Liver
Cylindrospermopsin	8.0 ppb [A, B]	Liver, Kidney

A. Swimming advisory: not to be exceeded on any day.
B. Recreational Criteria for Waterbody Impairment: not exceeded more than 10% of days per recreational season up to one calendar year.

Remember

In 2015 Fall/Winter edition of the Lake Beat, The United States Environmental Protection Agency (USEPA) issued the 10-day health advisory values of 0.3 ppb for microcystin and 0.7 ppb for cylindrospermopsin in drinking water for children younger than six years of age. For all other ages, the health advisory values are 1.6 ppb for microcystin and 3.0 ppb for cylindrospermopsin. Potential health effects from longer exposure to higher levels of algal toxins in drinking water include gastroenteritis and liver and kidney damage (Table 2).

***Table* 2. 10-Day Health Advisory for Drinking Water**			
Algal Toxin	> 6 years	≤ 6 years	Target Tissues
Microcystin	1.6 ppb	0.3 ppb	Liver
Cylindrospermopsin	3.0 ppb	0.7 ppb	Liver, Kidney

USEPA recommends utilities use treatment techniques to lower levels of toxins as quickly as possible. Steps that can protect the public from algal toxins in drinking water include: 1) Watching for harmful algal blooms in water bodies used as a source of drinking water, 2) Monitoring source water and drinking water for detections of algal toxins, 3) Treating drinking water as necessary to reduce and remove algal toxins, 4) Notifying the public that younger than school age children should not drink or boil the water if levels are above 0.3 ppb for microcystin and 0.7 ppb for cylindrospermopsin, and 5) Notifying the public that no one should drink or boil the water if levels are above 1.6 ppb for microcystin and 3.0 ppb for cylindrospermopsin.

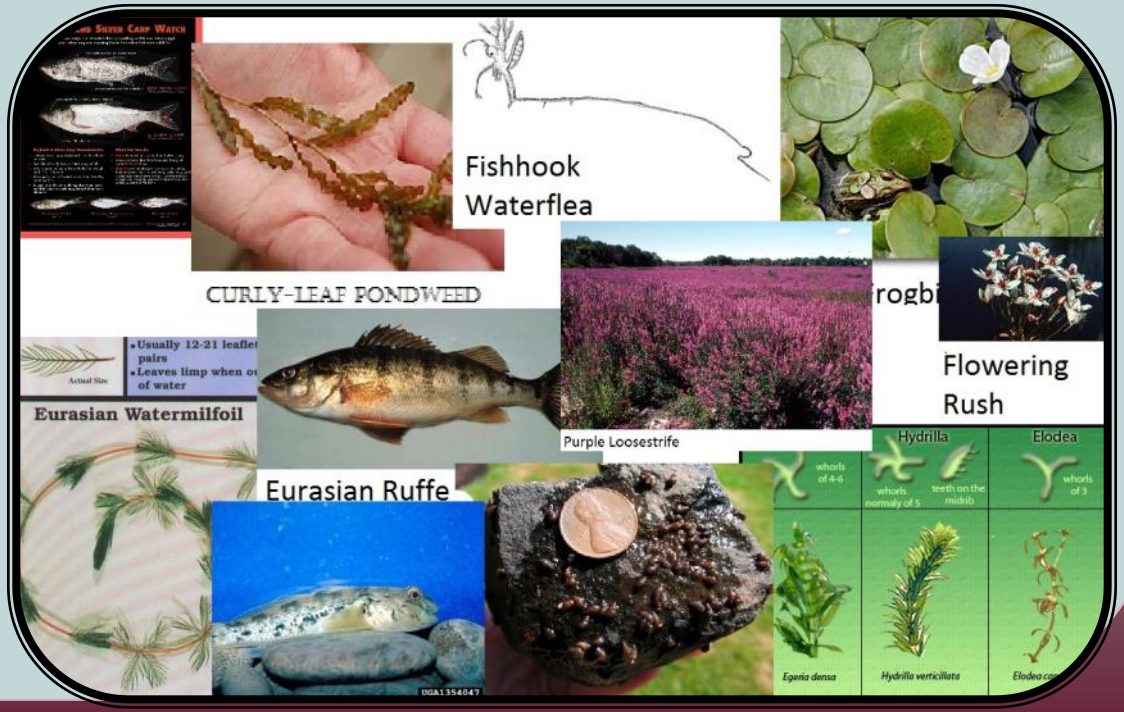
~Lake Staff

Stop the Spread!

Follow this checklist to defeat the spread of aquatic exotics:

If you are a boater, angler, water skier, sailor, canoeist or some other type of water enthusiast, there are some important things you can do to help prevent the spread of aquatic exotic species.

- Don't transport water, animals, or plants from one lake or river to another.
- Never dump live fish from one body of water to another.
- Remove plants and animals from your boat, trailer, and accessory equipment (anchors, centerboards, trailer hitch, wheels, rollers, cables, and axles) before leaving the water access area.
- Drain live-wells, bilge water, and transom wells before leaving the water access area.
- Empty bait buckets on land, not in the water. Never dip your bait buckets in one lake if it has water in it from another.
- Wash boats, tackle, downriggers, and trailers with hot water as soon as possible. Flush water through motor's cooling system and any other parts that may have been exposed to lake or river water. If possible, let everything dry for three days (hot water and drying will kill zebra mussel larvae).
- Learn what these organisms look like. Don't purchase exotic species as bait or for ornamental plantings. If you suspect a new infestation of an exotic plant or animal, report it to Illinois EPA's Lakes Unit (217/782-3362), Illinois DNR's Division of Natural Heritage (217/785-8774), Illinois DNR's Natural History Survey at the Havana Field Station (309/543-6000), or the Lake Michigan Biological Station (847/872-6877).
- Consult with the Illinois EPA's Lakes Unit or your local Illinois DNR district fishery biologist for guidance before you try to control or eradicate an exotic "pest." Remember, exotic species thrive on disturbance. Do-it-yourself control treatments often make matters worse and can harm native species!



If you see or suspect a Harmful Algal Bloom (HAB), contact EPA.HAB@illinois.gov and your regional VLMP coordinator

Remember

If you find Hydrilla or any new exotic species in your lake, contact your regional VLMP coordinator.

Regional Coordinators:

VLMP Statewide Contact

Greg Ratliff, IEPA, Springfield, 217-782-3362 & greg.ratliff@illinois.gov

Northeastern Coordinator

Holly Hudson, CMAP, Chicago, 312-454-0400 & hhudson@cmap.illinois.gov

Lake County Coordinator

Alana Bartolai, LCHD, Libertyville, 847-377-8009 & ABartolai2@lakecountyil.gov

Southern Coordinator

Tyler Carpenter, GERPDC, Marion, 618-997-9351 & tylercarpenter@greateregypt.org

www.epa.illinois.gov/topics/water-quality/monitoring/vlmp/index

Illinois Lake Management Association

The Illinois Lake Management Association (ILMA) is a great resource for lake managers, lake owners and lake homeowner associations, just to name a few. ILMA's mission is to promote understanding and comprehensive management of lake and watershed ecosystems. Check out the web site at www.ilma-lakes.org to see what they can offer you or your homeowner's association.

~Greg Ratliff